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Word Perfect	515	592
First Choice	215	247
Wordstar 4	415	477
Framework II	885	1017
Javelin	599	689
Jet	100	115
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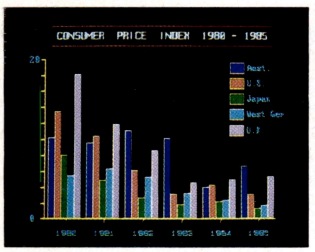

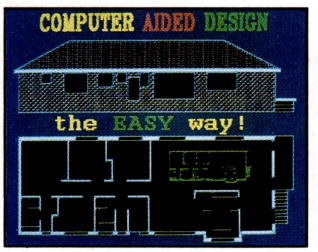

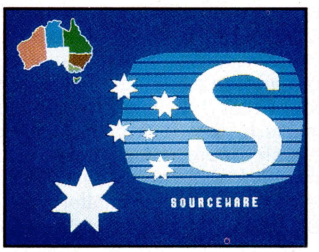

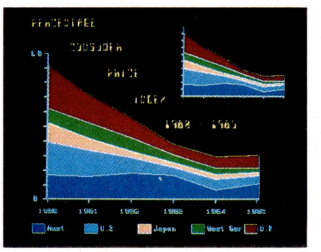

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Holding the High Ground

AS PREDICTED HERE a few months ago, IBM has made its move and announced a new series of PCs, the Personal System /2. The new machines show a marked abandonment of the earlier standards which IBM had set, through the use of 3 1/2 inch disk drives, a new expansion bus, new graphics standards and monitors and other technologies.

Looking at the prices of the machines, which start at $3500, I would have to say that IBM has failed to deal a crushing blow to the clone-makers. In fact, while the new machines do offer better value for money (on a performance/price basis) than earlier PC models, they are aimed fairly and squarely at the large corporate accounts and not small business, self-employed professionals and other quite large segments of the PC marketplace. In short, IBM is holding the high ground and abandoning the low ground to the clones.

Other things are interesting about the release of these new products. For example, the new protected mode operating system, OS/2, will not be available until early next year, and we won't see the 80386-based machine for some time, either. It rather appears that IBM has been stampeded into pre-announcing a number of products in order to stave off the opposition. Of course, this is offset by the responsibility of informing customers and software developers of future directions in order to allow strategic planning.

But despite all of this, I confidently expect the new System/2 machines to be top sellers in their target market. What IBM has said to its customers is this: 'The existing technology is suffering from compatibility problems as we try to expand it with new graphics cards, disk drives and other hardware upgrades. It's time to bite the bullet and fix all these compatibility problems at once, simultaneously introducing a system for avoiding hardware incompatibility through the adoption of software device driver standard.'

The resulting machines offer improved performance in a number of areas. First, there is little doubt that 3 1/2 inch disks are superior in all respects to 5 1/4 inch types: higher capacity, more reliable, more compact, more rugged. The only drawback was the inconvenience of transferring software onto the smaller disks; and now that IBM is in the market, software vendors are uncomplainingly supplying both formats.

Next, the machines offer higher I/O bandwidth through the use of IBM's MicroChannel expansion bus. This offers 16-bit data paths to peripherals. And of course, the integrated VGA (Video Graphics Array) is on the system board, effectively cutting out the market for add-ons with different standards.

IBM is now clearly addressing issues such as networking in a much more serious way, to pave the way for the day when the last terminal disappears and PC's running SNA LU6.2 and similar communications protocols take over as the primary means of communicating with mainframes. In particular, the propensity of current software authors to directly access hardware will cause enormous problems for multi-tasking, windowing, operating systems, and IBM (together with Microsoft) is enforcing standards to make the use of operating system software drivers more appealing.

What will be interesting to watch is whether other vendors delay product introductions to ensure compatibility with IBM's 80386-based oxes or whether they simply plough ahead, because they either feel *a*) IBM compatibility is no longer important or *b*) the 80386 has the capability of emulating other hardware in software anyway. Many may choose to go ahead and ship AT-compatible 80386 boxes regardless.

Similarly, will software vendors embrace OS/2? Because of limitations in its protected mode, the 80286 processor cannot run existing DOS applications in protected mode under OS/2 (although one DOS application, in a foreground window, will be supported by rebooting back into real mode), while the 80386 can — and already does — support multiple DOS applications. In fact Microport Systems, whose Unix I reviewed in the April issue of YC, can demonstrate multiple copies of DOS running as sub-tasks under Unix on an 80386-based machine, even running multiple copies of Flight Simulator in windows!

It's possible that many software houses, rather then cutting special versions of their programs for OS/2, will simply plump for the 80386, which will be widely available and able to run their existing software, by the time that OS/2 makes its public appearance.

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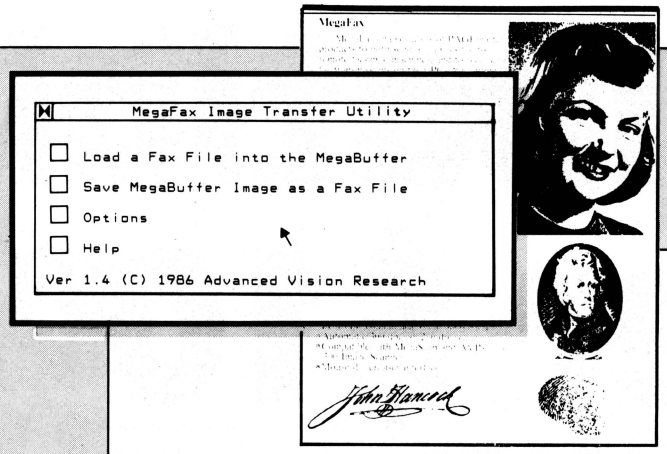

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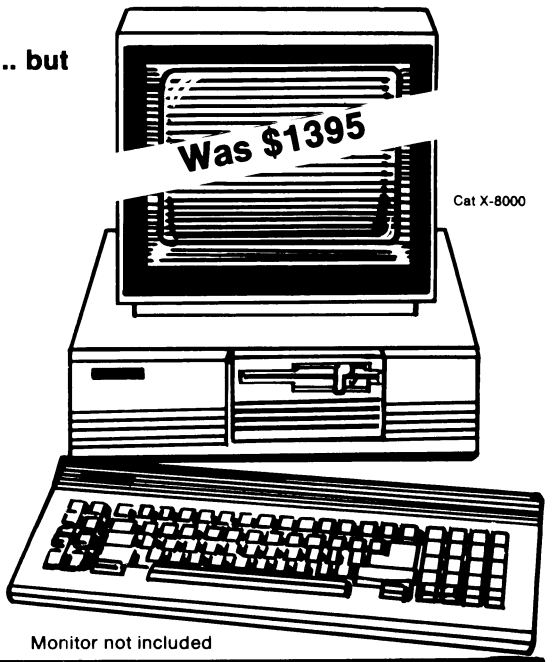

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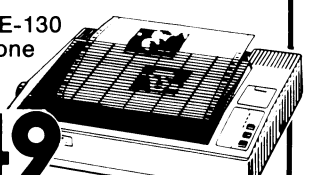

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HEAD HUNTING EDPS

HEAD HUNTING OF local computer talent has brought up some surprises with EDP executives top of the list, according to a survey organised by the Slade Consultancy Group on the Australian computer scene.

The executive head hunt on our local industry saw 30 per cent of overseas advertising devoted to EDPs while they were also sought after locally — a healthy 13 per cent of executive recruitment advertising was devoted to EDPs.

The quarterly survey covers all significant display advertising (disregarding classifieds) of executive positions carrying packages in excess of $25,000.

The research showed that advertising for EDPs was cyclical with peaks in March (14 per cent), September (13 per cent), and December (13 per cent). This interest in the EDP executive is as a direct result of the dramatic impact of data processing technologies on enterprises of all kinds throughout the community according to Geoff Slade, managing director of Slade Consulting Group.

The survey results showed that EDPs gained the highest average salary with $45,200 while EDP sales executives got $50,100. The overall average for all executive advertisements was $37,516.

The EDP market share for the executives was the largest at 18 per cent but the Public Service and Financial institutions claimed 17 and 15 per cent, respectively.

Despite the demand for EDP executives there was a marked decline in executive employment advertising throughout Australia — the 1986 figure of 1910 advertisements per week dropping to 1670 per week this year, a fall of 13 per cent.

Of all the capitals, Sydney was worst affected with a drop of 15 per cent in the number of executive positions being offered. Advertisements in Melbourne fell by 6 per cent and in Adelaide by 5 per cent. The exception was Brisbane which experienced a rise of 5 per cent. (Joh must be doing som sum sommm something right so don'us worry.)

Just a note for those out there looking for work: the biggest carrier of advertising for the computer industry was The Melbourne Age with 32 per cent, while NSW's Sydney Morning Herald contained 29 per cent of all advertising. □

AUSTRALIA CASHES IN ON THE CHIPS

Investment in the local computer industry is vital and Australia's largest electronics company, Amalgamated Wireless Australasia (AWA) has dug into the coffers to set up a $60 million chip manufacturing plant in the inner western Sydney suburb of Homebush.

The investment, which will be spread over two years ($30 million each year), will hopefully start the ball rolling in the manufacture of an Australian styled chip for eventual export.

The venture, which is organised in conjunction with The New South Wales Government and British Aerospace Australia (BAEA) will hopefully see Australia through to the next century in computer technology.

AWA will head the joint venture with a 67.5 per cent interest while BAEA and the NSW Government will contribute 20 per cent and 12.5 per cent respectively.

The investors, will almost be assured of 25 per cent of the local market, which is estimated to be worth $200 million a year. AWA should benefit the most with its extensive involvement in Australia's electronic network linked to their distribution network. □

COMPASS CORNER

Sales and interest in desktop publishing have increased dramatically in the past months. The total volume of desktop publishing sales accounted for 2.5 per cent of the applications software sold in March, according to figures gathered by Compass Research through Micro Store-Board. (Figures are based on sales of word processing, spreadsheet, database, accounting and other application areas.)

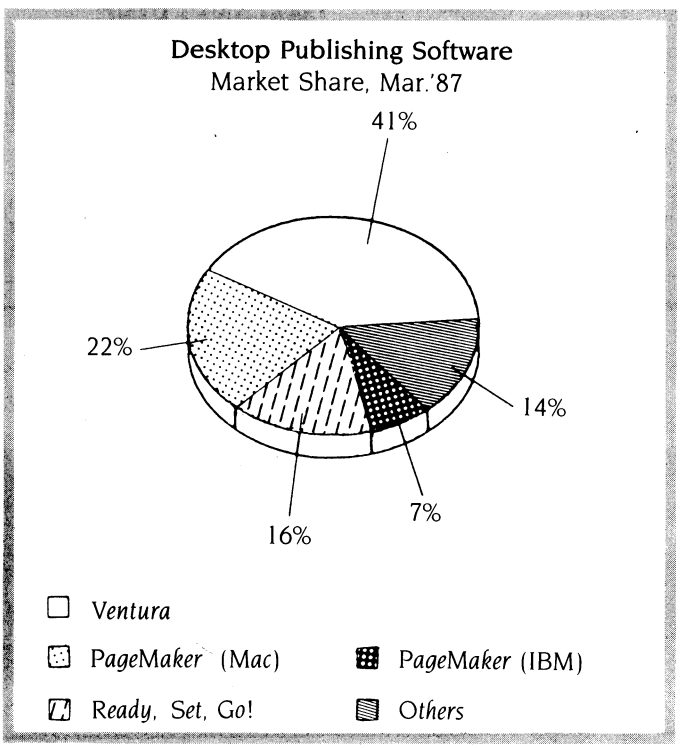
The volume of desktop publishing sales increased by 25 per cent in March over February. Ventura continues to be the highest selling package in the desktop publishing market.

There is currently a great deal of confusion among suppliers and buyers as to the viability of investing in the desktop market. It seems that there will be a settling period for the major part of 1987 with sales related directly to promotions and distributors tying up rights for this marketplace.

Many dealers have indicated to Compass an interest in the desktop publishing market. Some hope to use the current interest leverage higher returns from personal computer sales. However, the number of dealers which have embraced this emerging technology has resulted in stiff competition.

The total investment necessary for an end user in desktop publishing, is considerably higher than that for a PC plus, say, a spreadsheet. As a result, users' expectations for service and support are also higher. Only those dealers which are able to meet this requirement will reap the rewards.

The desktop market is seen as one of the fastest growing areas of the personal computer market in 1987. Sales of laser printers are anticipated to increase by more than 120 per cent and most lasers will be used for desktop publishing. Laser printer sales are expected to be higher than daisy wheel, ink jet and thermal printers combined. □



IBM PLUGGING FOR SAA

IBM appears to be stirring with the rash of announcements and releases that have been made in the last two months, but the most interesting is Big Blue's push for a standard for all of its machines, through the development of Software Applications Architecture (SAA).

The architecture, which is currently getting its sea legs in the US, will be available here in the second half of this year according to IBM. It will offer a standard look to their screens and standard tools for the operators, from the personal computer range up to the mainframes.

IBM developed the system after 'encouragement' from corporate users and competition from such companies as DEC, who have developed their VMS standard operating system across their range of Vax computers. □

MELBOURNE MONEY MANIA

A price cutting war looks set to hit the IBM market place when a chain of computer stores opens later this year, set up by a conglomerate of Australian businessmen with some US influence.

The chain, which will be known as Blue Chip Computer Centres, will be marketing IBM compatible systems complete with disk drive and monitor for less than $1000. The low price is a result of importing parts from the US, Japan and Taiwan and then assembling locally.

Three centres each have been set up in Melbourne and Sydney with a total of 25 to be set up by the end of this year. According to a company spokesman, Blue Chip will be targetting the home and business markets with low priced and very competitive computers. □

IBM PLEASED WITH POSTSCRIPT

In the wake of Apple talking MS-DOS with its new Macintosh II, IBM has shown it will not be out done and has stated that PostScript, Apple's much loved desktop publishing language, is the best for the future of the IBM range.

According to Jeff Mason, general manager of IBM's new independent Publishing Systems unit, IBM have settled on three standards for their publishing systems. Top of the list, naturally, is PC-DOS, followed by Microsoft Windows and finally Adobe's PostScript.

The announcement by IBM is an important boost to both PostScript and Microsoft and an unexpected one from Big Blue. □

IMAGINEERING PROFITS UP 90%

Can you imagine having 24 million dollars at the age of 27? Jodee Rich of software distributor Imagineering, does.

The company, which was set up in 1981 and went public in 1985, had a sales jump of 121 per cent for the six months ending February. Net sales were a record $34.691 million (up on last February's figures of $15.669). Profit before tax totalled $1.029 million with an after tax profit of $0.731 million.

Sales figures were strengthened with the 32 per cent contribution from six overseas operations in New Zealand and South East Asia.

Profit figures this year were affected, according to Jodee Rich, by the move to raise $8.6 million, intended to fund incremental growth opportunities, including possible acquisitions currently under review. 'Figures however are currently on target,' said Rich. □

IBM TURNING APRICOT

The latest moves by IBM with its OS/2 operating system are a copycat of the moves made by Apricot three years ago, according to Julian Barson, managing director of Apricot dealers Barson Computers.

The OS/2 operation system now adopted by IBM is an almost identical system developed by Apricot and Microsoft three years ago and will prove helpful to Apricot users.

The systems are compatible through very similar gate arrays, integrated disk drive controllers, serial and parallel ports and video and mouse ports which is complemented with the Operating System /2.

IBM's move into a market that already has a contender (even though Apricot has been very silent) will certainly give Apricot a boost while it may throw off many of the clone makers which have been dogging IBM's heels. □

IBM TAKES CHIPS INTO THE LIGHT AGE

Chips under development by IBM, which will double the speed of current chips, look like hotting up the computer industry even further.

IBM have developed an experimental chip which is fast enough to process 40 encyclopedia volumes every second through the use of light.

The IBM 'opto-electronic receiver' combines 'opto', the ability to read light signals, and the electronic ability to translate these signals into computer code.

The new technology is a major step into the fibre optics arena, which offers greater volume of information throughput, with exceptional accuracy. The day when computers can communicate *massive* amounts of data at the speed of light using optical cables instead of wires.

The speed of the chip is a result of placing communication and computing circuits — functionally quite dissimilar — on the same finger-nail sized chip and making the entire chip from gallium arsenide.

Gallium arsenide moves electrical signals much faster than the silicon used in most computer circuits. It has the added advantage of efficiently turning light signals into electrical impulses.

Much research and development has gone into the chip with new designs in large scale integration (LSI), which combine thousands of circuits onto a chip, and into altering fibre optic technology to accommodate the smaller space of a chip.

With fibre optic technology, messages are sent over the fibre and then converted back into electronic impulses through photodetectors. The redesigned photodetectors on the chip have been able to be reduced. □

STAR WARS CLAIMS SEVEN

Just when you thought it was safe to go back to your computer room in your secret installation, comes the report from England on more mysterious deaths linked to the Star Wars research effort.

Last year two programmers associated with the project were found dead. Vimal Dajibhai, a computer engineer on the highly classified Stingray torpedo project for Marconi (a British company involved in Star Wars research), supposedly fell from Clifton Bridge, Bristol, last August while Ashad Sharif, who was also working for Marconi, was found hanged in October.

This year more computer scientists and designers have gone missing or have died. The first was Aytar Singh-Gida, a researcher again on submarine warfare at Loughborough University, who disappeared while working at Derbyshire reservoir in January. No body has been found in the reservoir to show that he was drowned and no one has sighted Singh-Gida since.

Following the disappearance of Singh-Gida, Richard Pugh, a computer designer was found dead at his home under unexplained circumstances. Another Marconi researcher, David Sands, supposedly committed suicide when he crashed his car, which had been packed with petrol cans in the front.

The latest victim, Peter Peapell, a senior lecturer at the Royal Military College of Science at Swindon, a highly classified technical centre as well as an officers training establishment, was found dead in his garage underneath his car's exhaust pipe, while his car was left running.

The mysterious part of Peapell's death is the fact that tests done by police showed that it was impossible to close the garage door and then get under the car. Other evidence pertaining to carbon deposits have shown up discrepancies as to the cause of death. An autopsy was unable to find a cause of death other than through asphyxiation.

These deaths, which were first though to be unassociated coincidences, have now been linked to the death of Keith Bowden, a computer science professor, who's car plunged 10 metres on to a disused railway line in Essex in 1982. Of course the coincidence of the death of Bowden and Pugh in Essex, the numerous links to Marconi of several of the victims, and their involvements in the development of highly classified research using computers and new computer designs, adds to the intrigue.

The deaths have also attracted attention to the Stingray torpedo project which is embarrassing government departments. It has also raised the question whether the involvement of these computer professionals in dangerous military research is prompting assassin spies to go into action, or whether the work is proving too much for sane scientists and programmers.

Are they developing something which is that bad or that good that they cannot cope with the discovery? We will probably

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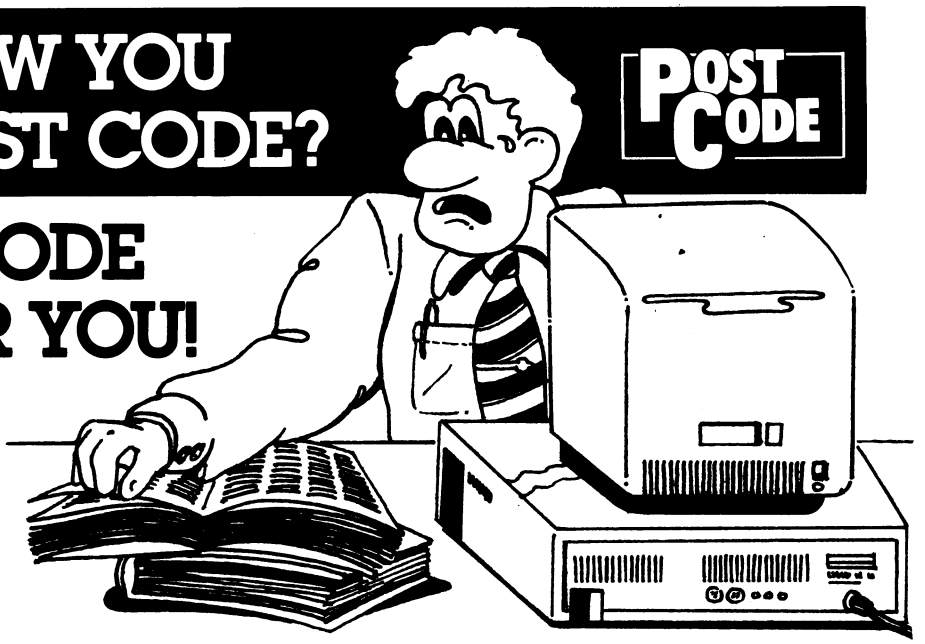

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Can't find the Postcode booklet?
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A great little utility. PostCode gives you an index to over 12 000 Australian postcodes — ready to pop-up its window anytime with a single keystroke, even from inside your favourite programs.

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PostCode uses a tiny 13K of memory and a 70K data file that you can use comfortably, even without a hard disk. Small, efficient and compatible. Just what you would expect from the company which invented resident software.

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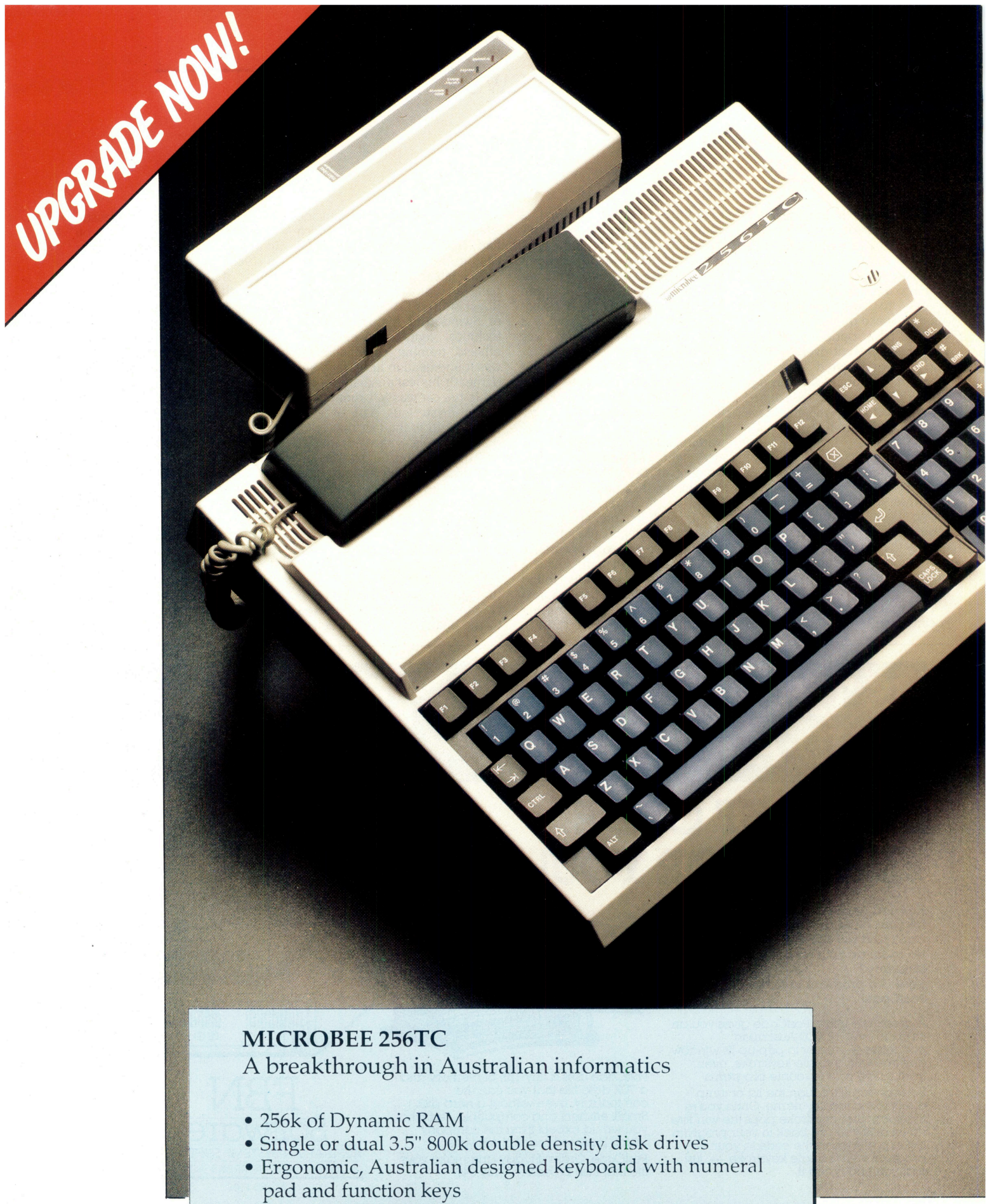

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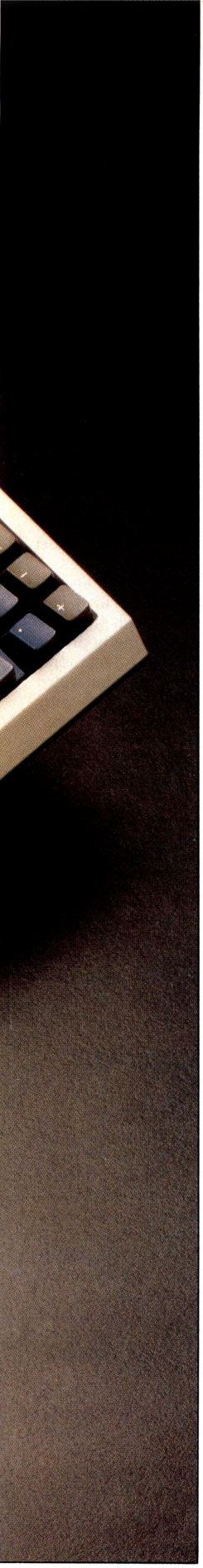

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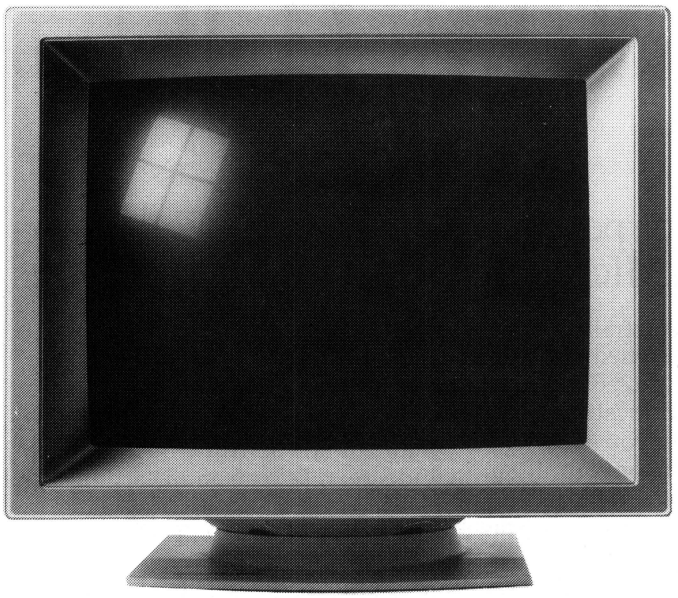

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Now despite the fact that we call the MULTISYNC the 'intelligent' monitor, it may not be the most intelligent business move we've made. However we're sure the MULTISYNC will keep you ahead of everyone else for a long time to come. To find out more telephone (02) 868 1811.

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never know as all the players in the intrigue appear to be eliminated quite effectively with no one having the answers. □

ELECTRIC TRADE WAR ONLY SEMICONDUCTS

The continuing tussle between the US and Japan does not look like affecting Australian markets with higher prices of semiconductors according to Australian Information Industries Association executive director, Bob Mounic.

The trade war has arisen due to a trade imbalance of US$132.3 billion in Japan's favour, according to National Semiconductor Corporation (the largest manufacturer of semiconductors) president Charles Sporck. This imbalance has been threatening an industry which supports 2.5 million people and exports US$230 billion.

President Reagan's move to impose a 100 per cent tariff on the importation of A$450 million worth of Japanese goods containing semiconductors, should not affect Australia adversely as no plans have been mentioned which would affect chips of Australian origin; and the importation of chips from America is nt large enough to cause an imbalance due to higher prices.

The only concern we have is for the fluctuating Australian dollar which is severely affecting the importation of computers and parts. □

AT&T SPEEDY CHIPS BY THE PACKET

Scientists at AT&T have taken a novel look at chips and decided that the reason that chips were slow was because of the packaging. Their radical new packaging of VLSI chips, developed by AT&T, has the potential to double or triple the speeds of integrated circuits, and reduce packaging costs as well.

Currently, integrated circuits (IC) are individually packaged to protect them from damage during testing, shipping and use. These packages each containing an IC are usually attached to a printed circuit board, and are then interconnected on the board.

As AT&T claim, the current packaging was designed at a stage in the industry where chips required access to the very small electrical input/output points, or leads, on the chip. These connections are typically 10 times larger than those on the chip itself, to make the wiring of the package easier. As a consequence the number of leads on a chip is limited to the number that can be fitted on a package.

As an added disadvantage of today's chips, some circuitry has to be devoted to push the current through the wiring board.

The new packaging technique provides a chip on a silicon wafer that has been patterned with micro-scale interconnections. The chips are not individually packaged and the silicon wafer takes the place of a printed wiring board.

Looking towards the future, AT&T will be designing chips (such as a 32-bit microprocessor) which will be able to perform twice as many operations per second as the current chips, or a general purpose signal processor which will improve the operating frequency three-fold, and system size could be reduced up to seven times. □

AUSSIE COMPANY, THE PICK OF THE CROP

It seems that us Australian's are an honest lot when we go overseas — we probably haven't learned enough from US marketing techniques yet — as New South Wales based On-line Data Processing (ODP) won the 'Operates Best as Advertised' section of the Pro-Gramme Awards. This is an excellent result in a field which consisted of 1,400 competing programs in 558 classifications from 300 publishers.

The awards, in their second year, are given out at the opening of the International Spectrum Conference, held in Las Vegas, to choose the best Pick based computer systems. Results are calculated on a wide survey of end users' reactions to products in various markets around the world.

ODP's win is a first for the Pro-

Gramme Awards for a non-US company in an industry worth A$3.5 billion. ODP's range has already gained wide acceptance from markets in New Zealand, Fiji, Papua New Guinea, Malaysia and Hong Kong.

The ODP 2000 range, their Pick based business applications, covers such systems as general accounting, distribution, manufacturing, an accounts practice system and a time and cost module. □

WESTPAC OFFERS HOME BANKING

Just when we are shown to accept ATMs, Westpac are now offering home and office banking on personal computers through their Handyline service.

The service allows you to ring up and log into your account using your home computer. The catch is that you need a 'touch-tone' phone or a 'tone sender' and Prestel software run on a computer using a Videotex keyboard.

After you meet all the requirements, it's possible to gain access to your account on three levels. The first is a general look at your account, for everyday account work and is provided free. For $4 a month you get the second option which offers an additional view of lending and investment information, insurance premiums, travel details and interest rates.

The top level entry is provided at $12 a month and gets additional access into a mailbox, market rates, investment rates, bullion, foreign exchange currency, term rates and trends. Of course the information is provided by Westpac and covers Westpac based information.

The local personal computer market is very healthy and banks are beginning to realise the market potential of offering a more comprehensive service than their competitors. But remember, you have to *need* the service frequently to make it worthwhile and that services such as this do not provide the chat value of Bulletin Boards. The move by Westpac is, however, a welcome one as it offers a greater use of your personal computer.

With the acceptance of ATMs, maybe home or office banking will take off in Australia with the same gusto, although a more comprehensive coverage by all the banks may be the answer for a service too good to refuse. □

AUSTRALIANS ARE ACCEPTABLE

We continue to be astounded by surveys — the latest, conducted by NCR, shows that we do accept such technology as automatic teller machines. Of course that's not hard to believe — every automatic teller seems to have a queue while the bank staff inside are queue-less.

The survey, conducted by the University of NSW, showed that we are not as conservative about high technology as is usually thought, and that we have been quicker to embrace the computerised teller machines than any other country in the western world.

The survey showed that since their introduction 10 years ago, the growth rate of the ATMs has averages 15 to 20 per cent a year. The new technology has (of course) been accepted more readily by the younger generation which the survey puts at between 26 and 45 years old (what you are before that age we don't know), with a staggering 85 per cent of the 'young ones' avid users of the tellers. □

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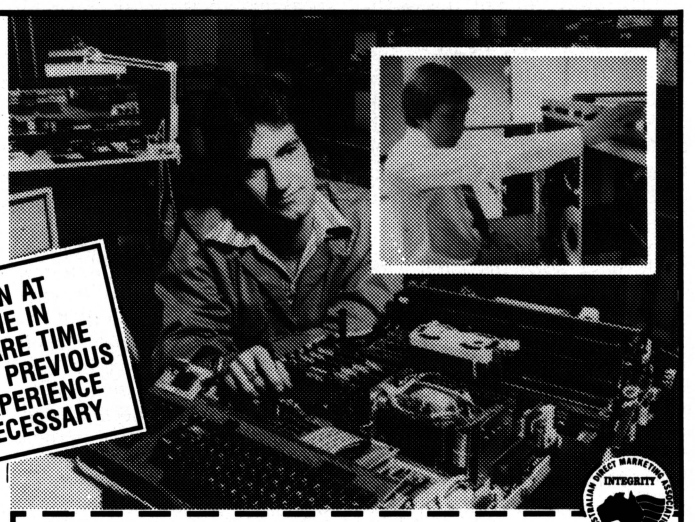
MAKE MORE MONEY?



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AMERICAN GRAFFITI

By Howard Karten

THE PEFFECT PRINTER

LIKE EVERYTHING else in the world of personal computing, printers make some parts of life easier, at the same time as they complicate things.

Here's an example. I've worked out a system I use to send work out to clients. The first thing I do is to prepare the label. It's a logical first step.

The other day, I experimented by trying to prepare the label in my (usually) trusty dot matrix printer. It jammed and stuck to one of the smaller pinch rollers — one of those that's cleverly hidden away, all but inaccessible, behind the main roller.

This forced me to waste an hour working with special printer platten cleaner (that stuff with that pleasantly volatile smell that undoubtedly means it's pickling your liver) in a futile effort to remove all the tiny little pieces.

So much for time saved. I could have done the label with calligraphy in the time I spent unlabelling my printer.

And with dot matrix printers, stealing sales from daisy wheels, it looks like I'll be spending more time in the future finding uses for (playing with) more of the hitherto unused features of my dot matrix printer — things like embedded double-width characters in alternate sets, italics, and alternate character sets; there is no end to all the playing I can do.

Wonderful — I've just barely learned how to use all the features of my word processor in plain-vanilla mode.

My friend John is a good example of how printers can help you waste time even as you're saving time. John is working hard on a newsletter he hopes to launch some time soon. He began with an ordinary formed-character printer. Then the technobug bit him, and it was clear to him that he needed something just a bit more high-powered.

After cleverly convincing his kids that a two-month diet of tofu and rice would be lots of fun, John diverted part of the family food budget to a laser printer.

That was a while ago. He has yet to put a single issue out, but he's had lots of detailed conversations with the folks who wrote his word processing package, trying to figure out how to make it drive the laser printer. He's also playing around doing about 87 variations of his proposed layout, type style, logo and other minutiae that go into a newsletter.

These examples, I suggest, speak volumes about how far personal computing has come — and where it might be headed.

Once upon a time (which in this business usually means three years ago), for instance, it was perfectly acceptable to send out something printed on a dot matrix, or on the thermal paper some teleprinters used.

No more, the stark functionality that was acceptable a few years ago (who cared if your document looked like hell — what mattered was what it said) is gone. Now looks count too. (When I was a lad, we used to satirize teachers suspected of superficiality by saying that in their evaluations of homework, 'neatness counted'. How far we've come . . .)

One conclusion I draw from all this is that Marshall McLuhan was right. McLuhan was the Canadian writer and philosopher whose book of some years ago added to our language the phrase 'the medium is the message.' Using media such as thermal paper and hard-to-read, inelegant dot matrix print, now conveys an unacceptable message.

The folks who so recently were blithely speaking about 'the paperless office' couldn't possibly know how wrong they were. Mrs Computer Writer is a good example: despite wonders such as electronic mail and voice mail, she finds the paper messages accumulating so fast that she gave up trying to file them properly. Instead, she's adapted what she calls a 'piling system.' I'll leave to your imagination what it looks like.

There are some not so obvious messages here as well. One is, 'Be on guard against those twin dangers of the computer age, verbosity and excessive fiddling.' Why? Easy! Dot matrix printers are too damn fast! In the days when the typewriter was king, it was a big deal to change a document because you decided you didn't like that word down there in the fourth paragraph. Now it's too easy, really, and that encourages excessive editing.

Similarly, paper zips through a dot matrix printer so fast that, in a lot of computerised offices, the 'short memo' is a thing of the past.

Moreover, it's only going to get worse. When IBM recently launched its 'Personal System/2', buried in the announcements were some new printers, and — get this — two models of a scanner designed to get images-on-paper into your computer in digital form. Naturally, IBM's action in effect constitutes official endorsement of the idea that paper is going to be around for a long, long time.

Actually, I figured that out for myself a few years ago, after I got my printer. I began to notice something curious in my office: the amount of paper I had and the different kinds, were actually increasing!

Now if you'll excuse me, I've got to run. I've got enough time before deadline to print this story out on the regular white paper. I'm accustomed to, with a handsome type font, in order to be able to do something hard-copy editing and get a feel for how it reads without having to push any 'PG DN' buttons.

SHORT BYTES

IBM's recent launch of its Personal System/2 family of computers is beginning to cause widespread changes to the computer industry.

With the announcement, IBM reduced the price of the AT by several hundred dollars. This of course, caused the clone vendors to drop their prices. Additionally, several vendors have indicated that they are working on competitors to the 20 Mbyte hard disk IBM announced for the entry level PS/2 Model 30.

The competing disks will be designed to operate faster than the 80 millisecond seek time of IBM disks.

Several vendors are also said to be working on extensions for, and alternatives to, OS/2, the operating system for the PS/2. No wonder IBM intends to sell it for US$795.

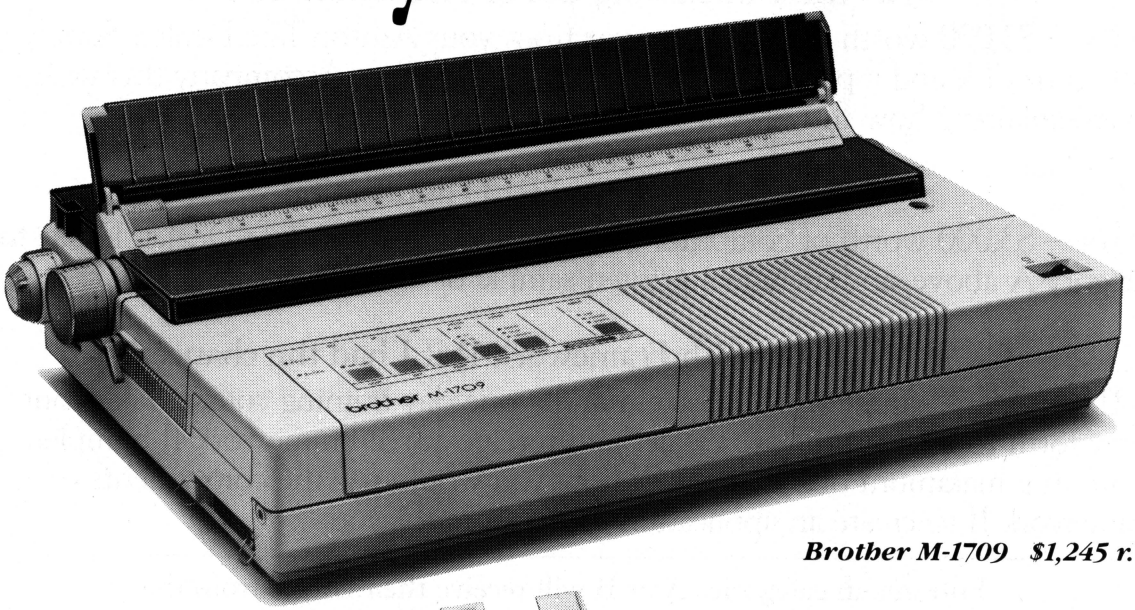
□ *How Sharper than a Serpent's Tooth Dept.* Recently, a Cambridge, Massachusetts company, SAPC (successor to Software Arts) filed a suit against Lotus, also of Cambridge, charging that Lotus and its founder (and former chairman) Mitch Kapor had violated the copyright, and the screen design, on property owned by Software Arts — a program called Visicalc.

Lotus in turn had earlier sued another Cambridge company, Mosaic Software, charging that Mosaic's screen design violated Lotus's copyrights!

In June, 1985, Lotus formally purchased Software Arts, along with the rights to Visicalc.

SAPC charges that Kapor — who played a key role in developing Visicalc while he was a Software Arts employee — unlawfully copied some key sections of Visicalc for 1-2-3. Moreover, at least one SAPC board member, Robert Frankston, is a Lotus employee! He opposed the suit and resigned from SAPC when the US$100 million suit was filed. □

How 'paper parking' and 24K buffer makes this printer faster than any other in its class.



Brother M-1709 $1,245 r.r.p.

The Brother M-1709 is faster than all other printers in its price range. 240 cps in draft mode, 50 cps in Near Letter Quality — real NLQ.

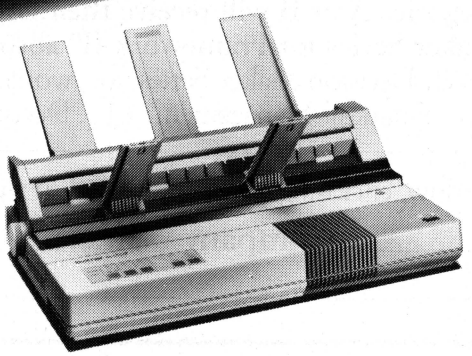
But that's only part of the speed story.

Paper Parking

This remarkable Brother feature, eliminates all the time wasting that would normally occur when you change between fanfold and cut sheet paper (even with the optional cut sheet feeder). You just 'park' one while you use the other. Think of the time you save!

24K Buffer

Brother's 24K bytes buffer memory means even more time saving. It holds the equivalent of about ten pages of typing, so, for most applications, you can still use your computer while the printer goes about its business.



Brother M-1509 $999 r.r.p.
Speed, looks and performance.
(Shown with optional extra, cut sheet feeder SF-40)

Plus quiet operation, auto paper loader, graphics capability, IBM and Epson compatability, front panel font and function selection, dual interfaces (Centronics and RS-232C).

The Brother M-1709 has every feature you've ever wanted in an office printer. Including speed.

For trade enquiries, a demonstration or further information, call Brother or post the coupon.

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YES, I would like a demonstration of the new Brother M-1709 printer.

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A. "Most Interesting Use of Framework II."

WIN — $3,000 worth of computer gear from your Ashton Tate Dealer. Supply us with your disk and a printout showing your application. Accompany this with a letter explaining how this is your most interesting use of Framework II.

B. "Most innovative FRED application."

WIN — $3,000 worth of computer gear from your Ashton Tate Dealer. Do as for category A above, and include a printed sample of the FRED frames.

C. "What I'd do with Framework II if I had the chance."

WIN — A Full Framework II System and a one day training course. Take your entry form to an Ashton Tate Dealer and receive a free Framework II Sampler. Write in a maximum of 2,000 words how you would use the components of Framework II to create an application to do more for you.

Entrants in categories A or B will receive their choice from the "Decision Maker Series for Framework II" absolutely free!
Tick which Decision Maker Series you would like:
Project Analysis ☐ Financial Management ☐ Decision Modelling ☐

Fill-in the Entry Form details below, enclosing your Framework II Submission:—

Name: _____ **Company Name:** _____

Address: _____ **Phone:** _____

**Send to:— Framework II "Doing More for You", P.O. BOX 21, NEUTRAL BAY, 2089.
Entries close on August 31, 1987 and judging will be done by a panel of industry experts.**

---

1. How long have you been using personal or microcomputers? _____
2. Including Ashton Tate Products, what other P.C. software do you currently use? _____
3. Approximately how many employees are in your company? _____
4. What is your occupation? _____

Rules & Conditions

1. Instructions on how to enter and prizes form part of these conditions of entry. 2. Entries close last mail 31 August, 1987. Winners will be notified by mail and their names published in 'Your Computer' magazine October issue, 1987. 3. This is a game of skill and chance plays no part in determining the winner. Each entry in categories A, B and C will be individually judged in accordance with the stipulated criteria and instructions. The judging will be done by a panel of industry experts selected by the promoter. The judges' decision will be final and no correspondence will be entered into. 4. The promoter is Ashton Tate Pty Ltd, Unit 2, 80 Berry Street, North Sydney, 2060. 5. Categories A and B can only be entered by owners of Framework II. Category C may only be entered by non-owners.

Publisher'sChoice!

Walking The PC Mindfield . . .

IF YOU WANT to desktop publish on IBM PC-style equipment, be warned: there are 11,497 possible combinations of hardware, software and peripherals. Give or take a thousand or so.

No, don't panic! Sit down, relax, read on as ever-helpful YC narrows it down for you. Not to a single combination, mind you, for that would ignore the definite 'different strokes' aspects of computerised publishing - we'll carve it down to a simple choice of software and a set of definitive guidelines on the right hardware.

The software must come first: while it's an apparently simple field (there are only three, perhaps two, programs worth talking about), it's actually far more complex because this is the one area where there really *is* a choice to be made.

Next month we'll look at the hardware decision which, surprisingly, is easier: as we will see, the brand name on the box is irrelevant as long as it matches the specifications we'll set out.

Six months ago there was no real desktop publishing on the IBM PC. Now it could take you six months to wade through all the possible combinations. If you want to avoid the hassle and heartache, Matt Whelan has the answers in this two-part series.

Softly, Softly

There are many areas bundled under the term 'desktop publishing', from basic pretty-printed correspondence to in-house reports, to full-scale newsletter and magazine production. As far as we're concerned, any desktop publishing outfit worthy of the name must be able to handle them all.

If you want less, you don't want desktop publishing.

Pretty printing can be handled by most competent word processor/laser printer combinations, as can simple page layout and report-style documents. But, *pretty printing* is not our definition of desktop publishing.

Thus we ignore word processors, even those as capable as Microsoft Word, Wordcraft and the like, when we talk of desktop publishing. (Can we refer to it as DTP? Ultimately it will save several trees.) Less politely, we ignore the awful bubblegum products like ClickArt Personal Publisher, both in its original form and in its more recent Fleet Street Editor disguise.

Which brings us to a selection of just three programs:

- **Aldus PageMaker**
- **Harvard Professional Publisher**
- **Xerox Ventura Publisher**

Each of these has a different heritage, and it shows - not only in the user interface, but also in the products' suitability for different tasks.

In desktop publishing, we really do have a 'horses for courses' situation. I will never recommend a particular package to anyone without first hearing a detailed description of the type of work they plan to do.

A look at the origins of the products gives us a preview of their capabilities:

PageMaker comes from a graphics design background, and it shows. It simulates a draughting board-style workbench with space around the layout page to 'put aside' galleys of type, illustrations and so on while you decide where to place each 'design element.'

Pull-down (and across) guide rules assist precise line-up of type and illustrations as the individual components are assembled into a page design. Free-form placement is complemented by a set of tools for drawing rules, borders, circles and tones. The interactive scaling and cropping of both bit-mapped images and line drawings is a natural part of the 'mode-free' point-and-click interface.

Harvard Publisher was born from SuperPage, a professional typesetting/page makeup system, and bases its structure around typography. It even draws the screen like a typesetter, moving the page as it goes and placing items in the same order they would be sent to a phototypesetting machine.

However Harvard's heritage is not 'pure' - while it was developed in a typesetting environment, it's being marketed by Software Publishing Corporation, a company known for its beginner-oriented products like the *pfs* series. SPC has imposed its 'user-friendly' standards on the authors, which has somewhat changed the final appearance of the product.

Ventura Publisher seems like the combined effort of a book author and a production artist. It is far more formal than PageMaker and appears, in fact, a little like a very advanced, mode-based, WYSIWYG word processor.

It is largely based on the concept of quick production of long manuscripts, with features like chapter and section numbering, table of contents and index generation. Its 'bulk placement' of text makes it a very powerful production tool, taking an author's final manuscript and turning it into a finished product in a single, automatic (if used correctly) step.

Shell Be Right

User-friendly shells which hide DOS (is it Dreadful Operating System, or Dreary, Old, and Sinister?) from the user are an important aspect of DTP. Each of these products takes a different approach.

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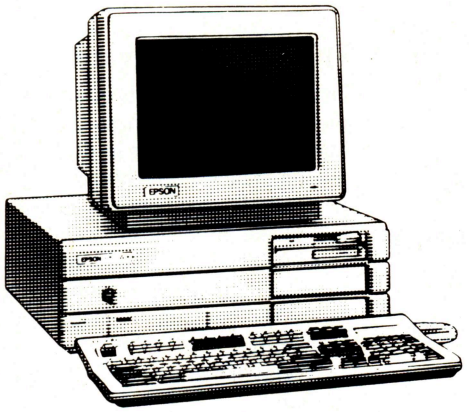

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Ventura uses Digital Research's GEM (Graphics Environment Manager), an interface so like the Macintosh that Apple volunteered legal action. The similarity is both good and bad - good in that it is a friendly, intuitive interface; bad in that, like the Macintosh, it is a one-thing-at-a-time single-tasking environment.

PageMaker's choice of Microsoft Windows as its shell gives it two, perhaps three, significant advantages.

The first is the use of colour on an EGA (Enhanced Graphics Adaptor) screen: while colour is irrelevant in page makeup itself for the moment, it provides a visual distinction between screen components (the makeup page, tools, scroll bars and so on) that simplifies the working environment. Put simply, it's easier for the befuddled user's brain to grasp at a glance what's what on the screen.

The momentous advantage of PageMaker is the 'multi-tasking' provided by Windows. (No, it's not true multi-tasking, but it's so close the user will never know the difference.) This allows you to open several windows at once to perform other tasks - like finding that missing file, creating a drawing for use in the page layout, or even opening a second PageMaker file to cut-and-paste between publications.

If you're organised enough to have all the components of a publication firmly in your mind before you start laying out the pages, this may not seem significant - but for most people it's a blessing. And, while those who haven't yet experienced 'concurrent processing' may find it hard to see its value, virtually every one I know who has used it, finds it almost impossible to return to a single-tasking environment.

The third, less tangible advantage Windows has is market support. It doesn't have an enormous lead in this area (both products tended to revel in a lack of initial support), but it is out in front.

Incidentally, a Windows-based version of Ventura is slated for release late this year - so the pundits' claims that Ventura would be the saviour of GEM, have fallen flat.

Harvard Professional Publisher, like big-daddy SuperPage, is totally self-contained. And that was the first big mistake.

One of the major advantages of shells like GEM and Windows is that they handle screen and printer support. This means the programmers don't have to match different hardware combinations themselves. Both Ventura and PageMaker can run on virtually any IBM graphics screen from the basic CGA (Colour Graphics Adaptor) to the high-resolution displays like the Wyse 700, the Viking, or the MDS Genius.

Next month we'll look at the hardware decision which, surprisingly, is easier: as we will see, the brand name on the box is irrelevant as long as it matches the specifications we set out.

Harvard will run only on the EGA or the Hercules graphics card. SPC's insistence on ignoring lower-resolution displays is understandable; its inability to handle higher resolution is not.

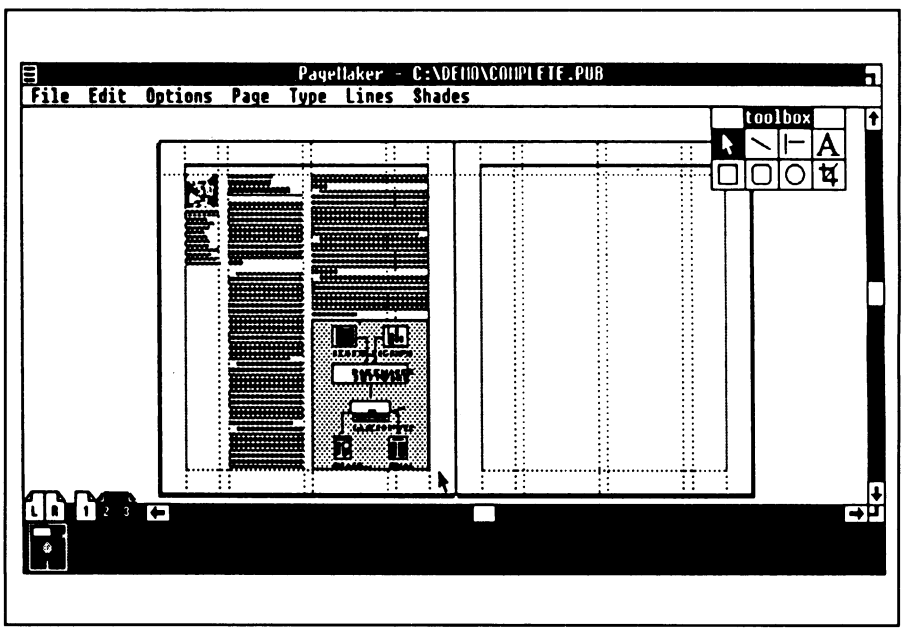
Dismissing Harvard

I might as well get this off my chest before we get down to business - I don't consider Harvard a contender in the desktop publishing stakes even though it has several particularly nice features. Had it been released six months before the others, it would have been considered an excellent product - but then, it was just about the only DTP package available for the IBM at the time.

Today it just doesn't cut it on the open market.

I held great hopes for Harvard because of its heritage. I expected it to be typographically superior to any other DTP program. And, when I first saw a demonstration I thought I was right. The supplied demo concentrated on the innovative features - real drop-capitals, excellent H&J (hyphenation and justification), vertical justification, the ability to flow text around uneven shapes - but what it didn't show, naturally, was the missing components.

I suspect Software Publishing Corporation's insistence on a totally menu-driven interface has hobbled the program. There just isn't enough in the package, and travelling through several menus to reach what is there, often seems



Ventura is very Mac-like in appearance, but far more 'formal' in use. It really shines in its rapid make-up of long documents. This sample shows the use of separate frames for separate items, an approach which makes multi-component layout more difficult.

too much trouble.

It *is* typographically superior to most existing DTP packages, including Ventura. But it is beating the first-generation products which were clearly lacking in this area. It holds no such advantage over programs like PageMaker on the PC.

It may be that Harvard's particular areas of expertise make it viable in some situations - if your publishing needs are simpler than mine, you may love it. But, as a general rule, I cannot recommend it.

Likes and Spikes

I love PageMaker, I hate Ventura. I love Ventura, I hate PageMaker. Both statements are true, depending on the job I am trying to do at the time. I have a simple (but flexible) rule: if the document is eight pages or less, use PageMaker; if it is more, use Ventura.

When to use which really depends on the type of document rather than the length, of course, but the rule works 90 percent of the time. Note that a 100-page magazine is simply a series of shorter layouts, rather than a single document.

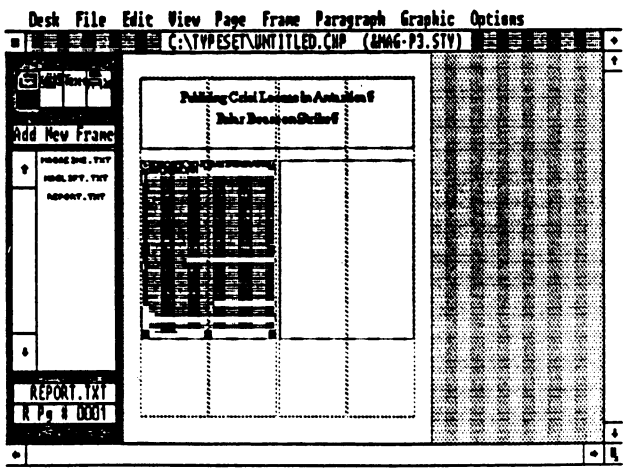
PageMaker is a designer's tool, a layout person's dream. It is *the* program for magazine, newsletter, flyer and brochure work.

Harvard will run only on the EGA or the Hercules graphics card. SPC's insistence on ignoring lower-resolution displays is understandable; its inability to handle higher resolutions is not.

Ventura is significantly less comfortable with finicky or multi-component design. Its forte is the bulk processing of text: the instant, automated layout of uniform-design, multi-page documents.

Each month I produce *dLetter*, our eight-page, subscribers-only dBase newsletter, using desktop publishing. Doing it with Ventura is a pain, with PageMaker a joy. And the PageMaker result looks significantly better.

I also regularly produce seminar manuals of between 100 and 400 pages, and wouldn't consider using anything but Ventura.



The PageMaker screen - just like what we're used to on the Mac, only better! (Whether you like the Mac or not, it has set the standards in desktop publishing). The free-form layout approach makes this **the** *package for art directors.*

Horses for Courses

PageMaker is my program of choice. It is easier to use, more friendly, more intuitive. Its typeface handling is better, it's more precise, its typographic control more extensive. As a 'veteran' of the publishing industry, it suits the way I work.

However, some of the new features introduced to desktop publishing by Ventura now stand out as glaring omissions from PageMaker.

The most significant of these, by far, is the use of tags associated with blocks of text. You can define up to 64 tags in a document, and simply click on a paragraph or block of text, then click on a tag (from a list beside your layout page), to give the text those characteristics.

For example, the Body Text tag (any un-tagged text defaults to this) may specify nine-point Palatino on 10-point leading, justified, hyphenated, and with a paragraph indent of one em (in fact, the characteristics of the text on this page). A tag for cross-heads may lift that to 12-point bold, ragged right, while a heading tag can specify 48-point bold, centred.

You can go on to create more tags as needed for style variations, including special effects like drop-caps (the big first letter at the start of this review) and bullets (a black 'blob', box or other special character of your choice as a highlight at the start of a paragraph).

Instant Change

If you change a tag's properties, all text associated with the tag changes immediately to the new style. This is a feature typical of command-driven systems (including a lot of 'traditional' typesetters), that can be invaluable when you want to change the appearance of a document - doing so the PageMaker way means going back and changing each portion of non-standard text individually - a tedious job if there are more than several pages to the document.

Most importantly, these tags can be inserted in the text as it's typed into your favourite word processor. You simply place the tag name, preceded by an 'at' sign (@) and followed by an equals sign, where you want to tag the text. Laying out

the text can then be as simple as placing it on the page. (Harvard also allows embedded tags in your text - in fact, like typesetting systems, it tends to expect them.)

PageMaker provides more fonts and more control over the type, but its lack of tagging means anything but body text has to be selected individually, then assigned type characteristics from the type menu. (However, PageMaker does make good use of the IBM function keys, allowing bolding and italicising, as well as size changes, at the touch of a key).

Again, with Ventura various other commands can be inserted directly into the text to individually control text attributes, insert special characters, choose fonts, set point size, kern characters and so on.

Other inserted commands available include line breaks, discretionary hyphens, non-breaking spaces, footnotes and index entries. All of these features are available while laying out pages with Ventura, of course, but the ability to pre-format them when it suits, is invaluable.

This ability makes it shine in the preparation of books or manuals - the manuscript (and an associated style file) can define the finished appearance of a document. When you're ready to lay it out, you just drop the text into a fresh chapter and it's finished!

Using this technique, one of our seminar demonstrations produces a finished layout of 26 pages in eight seconds. Believe it! And I have used this feature to lay out *and* print a 180-page seminar manual in three hours - a page a minute, from raw text to finished art.

The preparation of the text involves no more work than it did in the 'old days,' when I included WordStar and StarIndex dot-commands in the text as I typed it in.

If you use one of the popular IBM word processors, both Ventura and PageMaker automatically carry the text attributes into the document without any special coding.

Venturadvantages

Ventura can embed commands, and combines that with built-in handling of multi-level chapter/section headings (up to eight levels deep and automatically numbered), table of contents generation, indexing, and footnoting. And *that* sets it apart from all other WYSIWYG programs, PageMaker included.

Another important plus, is its use of *style files* for the basic components of page layout, text attributes (tags), chapter design and so on. You can establish styles for a whole range of documents, from letters to magazines to books, and keep them on disk as the basis for future publications. A range of sample styles (and 'chapters' to go with them so you can see the result) is provided with the package.

Ventura is significantly less comfortable with finicky or multi-component design. Its forte is the bulk processing of text: the instant, automated layout of multi-page documents.

In many ways it spells the beginning of the end for command-driven systems like TeX, whose major advantage was the ability to define a style (plus headings, section headings and so on) for large slabs of text and then change the style quickly to reformat the document. So far TeX is still the answer for mathematical and scientific typesetting, but in all other respects it seems the WYSIWYG programs will take over.

Ventura has so many new features it sounds like a PageMaker killer. But, it isn't - many of these features are only useful in a small percentage of DTP applications.

However, there are two Ventura features I would dearly love to see in PageMaker. The first is text tagging, the second is the retention of a publication's text in its original word processor files.

PageMaker, like the desktop publishing programs we're used to on the Mac, places the text on the page and then saves the whole lot in its proprietary format. That means even if you correct a hundred errors on the laid-out page, none of these will make it back to your original copy.

The all-in-one method has another drawback - the size of the resulting publication file (most of which is disk-wasting duplication) and the time it takes to save a document (an inordinate amount with large publications on the Mac, although not so with the PC version which does a 'mini-save' at each page turn).

There is one real problem with Ventura's separate-file operations - and it really *is* significant. When it reads a WordStar file (and when it stores it back to disk), it inserts spaces after hyphens which appeared at the end of a line in the WordStar file. As these rarely end up at the end of a line in the Ventura layout, the extra space is definitely *not* appreciated.

Speedy WYSIWYG

Ventura has a couple of features which make it potentially the fastest WYSIWYG program for the PC - yet a few design faults take the edge off its speed potential.

First, you can determine the size of the characters which will appear as 'Greek' - that's shaded rows representing the text on the page - and setting this appropriately, speeds up screen refresh markedly.

Then, to really speed up screen handling, you can tell Ventura tohide pictures - it shades the screen to show where they areplaced. This makes a dramatic difference, but as much because of Ventura's slow bit-mapped graphics handling as anything else.

PageMaker reads in a graphics file and 'thins it out' to a manageable size for screen display. Swapping from page to page or, more importantly, zooming in and out on the same page, is almost instantaneous.

Ventura recalculates from the full-resolution image each time, which can be excruciatingly slow. I measured 25 seconds to zoom in on a page. If you've ever watched a screen for that long waiting for something to happen, you'll know just how bad that is.

If Ventura's speed in text display is a step forward, its lack of screen scrolling during text (or graphics) entry and its difficulty in moving around the page, add up to three steps backwards.

To move to a particular point on the

This article was laid out and "pasted up" using PC PageMaker, and produced on a Linotronic typesetter by McQuade's Bureau in Sydney.

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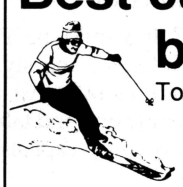

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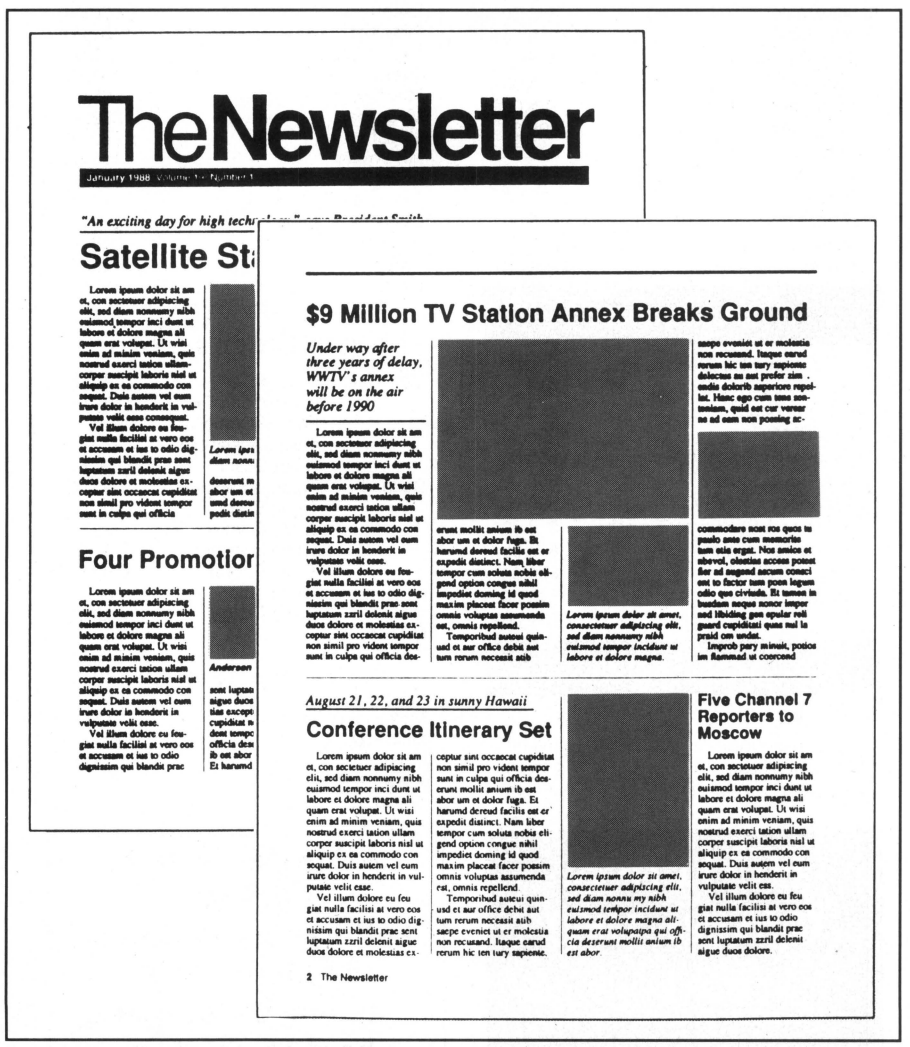
page you have to use the scroll bars - with PageMaker you just point the mouse at the spot you want and click the right-hand button to zoom in. Another click takes you back out to a view of the full page, so you can move from corner to corner almost instantly.

PageMaker's Fontastic

When you bring up Ventura's Postscript font menu you find only four of the 11 LaserWriter Plus typefaces, and in a limited range of sizes. PageMaker offers all the fonts in any size you care to nominate, up to 127 point.

(Interestingly, I consider the 127-point maximum an unnecessary, if acceptable, limitation - a PostScript printer is capable of scaling characters up to any size the software asks for.)

The Ventura manual provided the answer. It explained that the font metrics file (its internal description of each font, necessary to allow accurate screen representation) had to reside in memory. As all the text in a document being laid out has to fit in memory as well, the font metrics file has to be kept small by limiting the number and size of fonts available at any one time. All I had to do was edit a text file listing the available fonts and the sizes I required, and run it through a supplied utility, to produce a font metrics file with exactly what I wanted.



There's a lot of maturity, thoughtfulness and market support behind PageMaker - as in the example above, from **Pagemaker Portfolio: Designs For Newsletters** *released recently by Aldus (the design templates are on disk, and a comprehensive manual explains their use).*

All of a sudden my favourite type sizes were back on the menu - but not too many of them, because I wanted *some* room left for my documents. It's very restrictive, and that's a word I never expected to associate with PostScript printing.

The Crunch: Type Quality

Not only is PageMaker better at providing fonts, it is better at using them. Its dictionary-based hyphenation is far superior, and it provides automatic kerning above any user-defined font size. Minimum and maximum word spacing and the end-of-line hyphenation zone are user-controllable.

PageMaker (and Harvard Professional Publisher, if you must) on the PC and Ready, Set, Go version 3.0 on the Mac are the only existing WYSIWYG programs I consider typographically competent. I would never use the others to typeset this magazine, for example, without a lot of manual massaging.

Of the three, PageMaker is the best. As second-generation software, it's a mature package with all the benefits of user feedback from the Mac version.

New Versions

Version 1.1 of Ventura, due for release in June, solves many of the current version's problems likr the lack of scrolling. It provides for input from over 500 word processors and graphics packages (including Macintosh formats), and attempts to remedy some of the typographic deficiencies.

Similarly, new versions of PageMaker will answer many of my questions. First on the list is writing text back to the word processor file, but others will be there in the next release, I'm told.

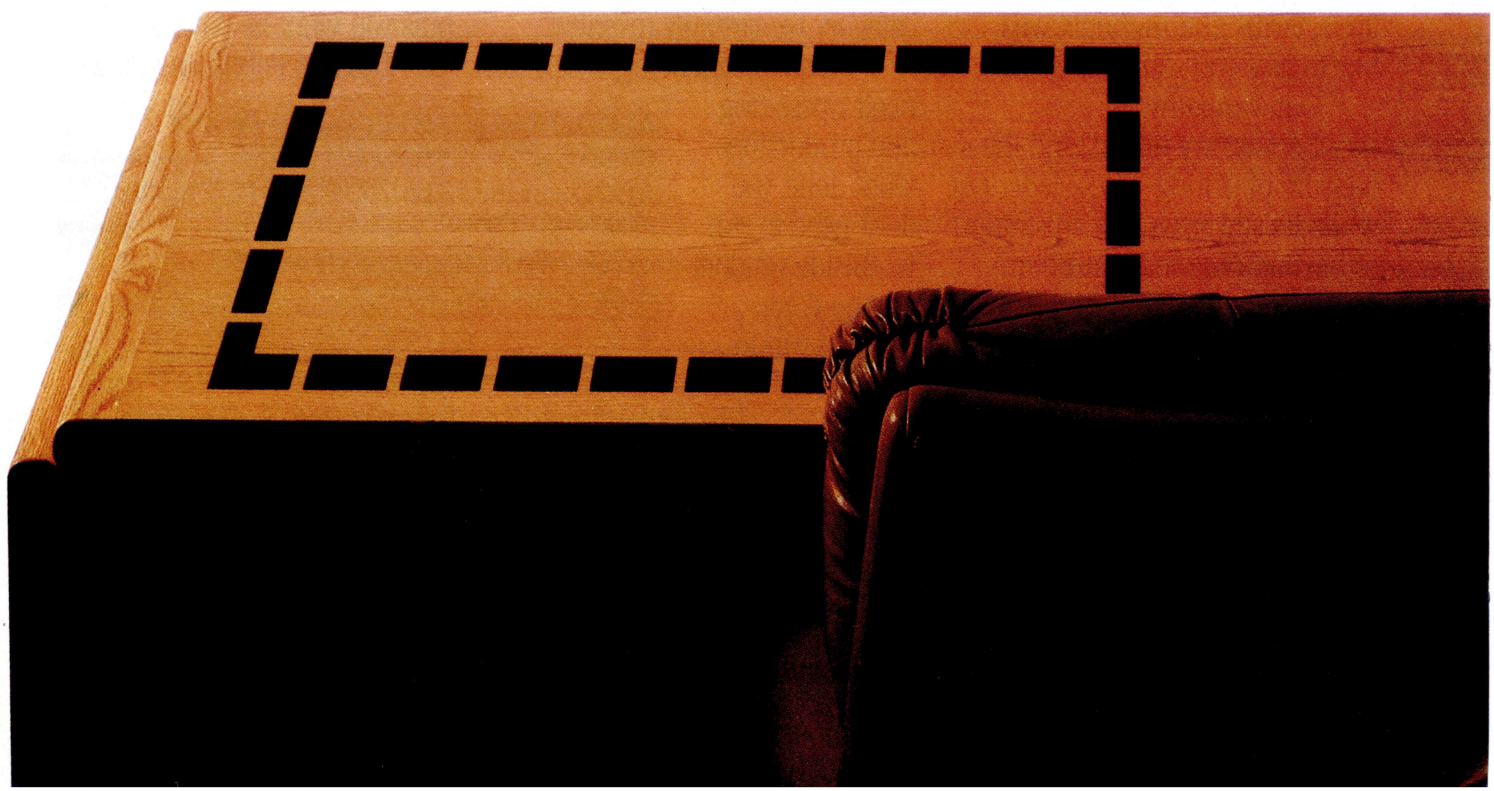
The DTP field is changing week by week, and any new features like those introduced by Ventura are soon emulated by the opposition. Be patient; the ideal package can't be far off . . .

This Week's Selection

My ideal program? It would be PageMaker for the user interface and style of operation, with Ventura's bulk-text handling including tags, indexing and table of contents, plus Harvard's drop-capitals and graphics runarounds.

Until it exists I'll stick to PageMaker **and** Ventura, most often (but not always) in that order. □

How to build a design studio, a type house and a print shop on your desk.



Introducing Desktop Publishing Plus.

You can hook up to 31 Macintosh Plus computers up to one LaserWriter Plus over the AppleTalk network.

If you're in charge of producing your company's newsletters, flyers, forms and manuals, we'd like to give you something:

Our sympathy.

Because we understand the pressure of getting a newsletter out while it's still news. The frustration of having a manual with more type bills than pages. The panic of revising a presentation ten minutes before you present.

Sympathy, of course, won't solve your problems. But we have something that will. Our Desktop Publishing Plus system.

The whole idea of Desktop Publishing Plus is based on the concept of desktop publishing, a category we virtually invented.

That concept being, when you need typesetting and production work done, you don't need to run to outside vendors anymore. You can just run to your desk.

Which will save you time because you can create, revise and, in many cases, produce mechanicals without going back and forth to type shops all day.

And you'll save money, because of all the monstrous type bills you won't be paying.

Desktop Publishing Plus actually consists of two pluses.

Our Macintosh Plus computer and our LaserWriter Plus printer.

The Macintosh Plus is the most powerful personal computer

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz ITC Avant Garde Gothic

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz ITC Bookman

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz Helvetica Narrow

Here are some of the new faces you'll be seeing around the office. And you'll be seeing them in sizes from 4-point to 720-point.

For an authorised Apple dealer near you, outside Sydney call toll-free (008) 221555. In Sydney, call 908 9088.

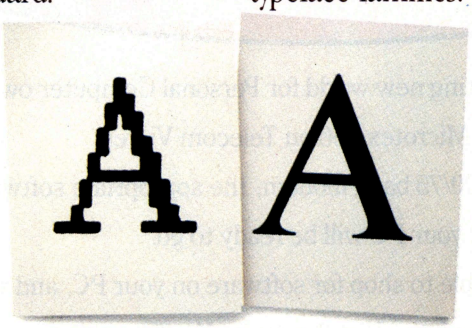
we've ever built. Its Motorola 68000 microprocessor and full megabyte of memory allow you to run powerful graphic and page design software programs. As well as powerful word processing, spreadsheet, database, and other business programs.

And its point-and-click mouse technology makes it easier to use than Letraset. So you can spend more time doing work instead of learning how to get the computer to work.

The LaserWriter Plus printer has the same 68000 microprocessor that's in the Macintosh Plus. Not to mention a hefty 1.5 megabyte of memory and a megabyte of ROM.

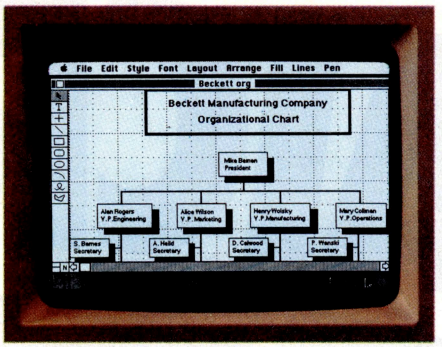
And inside its ROM is POSTSCRIPT, the page description language that is quickly becoming the industry standard.

Translated, this means the LaserWriter Plus can cover an entire page with virtually any combination of near typeset quality text and high resolution graphics.

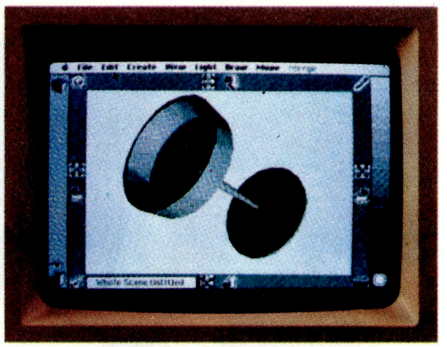


The crisp looking "A" was done on a LaserWriter Plus. The fuzzy one was done on a standard dot matrix printer.

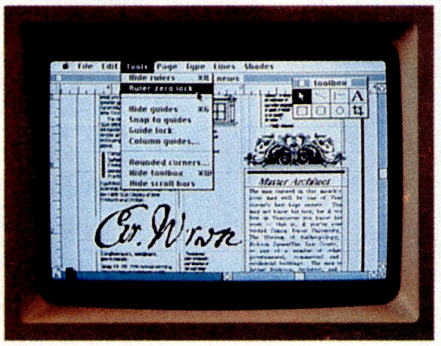
POSTSCRIPT also allows the LaserWriter Plus to generate dozens of different type styles and hundreds of sizes from its 11 built-in typeface families. These families being Helvetica, Helvetica Narrow, Times, Palatino, ITC Avant Garde Gothic, ITC Bookman, New Century Schoolbook, ITC Zapf Chancery, ITC Zapf Dingbats, Courier and Symbol. And more families are becoming available all the time.



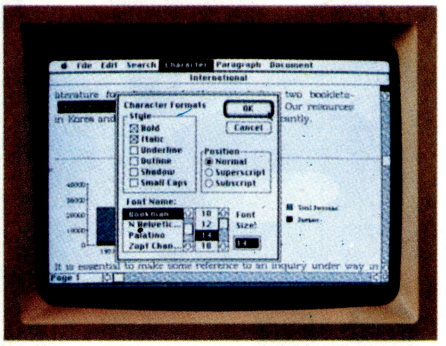
MacDraw from Apple



Easy 3D from Enabling Technologies



PageMaker from Aldus



Word from Microsoft

All of which means, you can now generate professional quality manuals, reports, presentations and overheads faster than you can say "you can now generate professional quality manuals, reports, presentations and overheads."

And if you decide you need commercial typeset quality printing, the Macintosh Plus can easily hook up to larger POSTSCRIPT compatible typesetting machines like a Linotype Linotronic 100 or 300.

So visit your authorised Apple dealer.

And start making plans to build a design studio, a type house and a print shop on your desk.

But don't expect to have a ground-breaking ceremony in your office.

Just expect to break some new ground in it.

These were produced with nothing more than a Macintosh Plus, a LaserWriter Plus, and software like Aldus' Pagemaker, Microsoft's Word and Excel, and our own MacDraw and MacPaint.

BETTER FOR MICROS

Now there's an exciting new world for Personal Computer owners to explore. The world of Microtex 666 on Telecom Viatel.

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Suddenly you'll be able to shop for software on your PC, and actually download it directly through the Viatel system. You'll be able to get PC advice and tips. Even place messages on the system for other Viatel users to read and respond to – literally a PC talkback service that lets you have a say on almost any subject.

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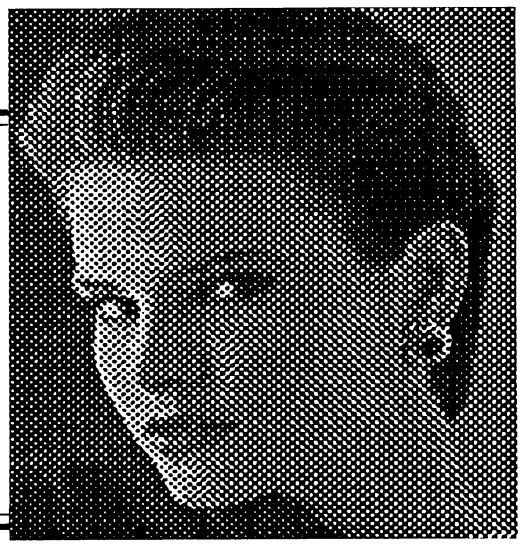
TM657C

President's Power Publishing



An elegant combination of converging technologies — typesetting, printing, optical character recognition, facsimile transmission and more — makes President Computers' desktop publishing system potentially the best in the world today. Matt Whelan has now tested it three times and says it gets better by the week . . .

MELBOURNE was a wasteland, I decided, after discovering none of the companies or people I knew had a facsimile machine. Nor did the hotel — even worse, nor did it have the staff to type in a telex for me. I had a seminar schedule that had to be transferred to London urgently, and the thought of reading it out over the phone was depressing.

As I wandered into the dimly-lit ballroom, scene of our desktop publishing seminar that day, the penny finally dropped: the technology I needed was right there in front of me!

I switched on the bank of demonstration hardware, half confident yet fearful. With so many steps through so many different technologies ahead, something had to go wrong . . .

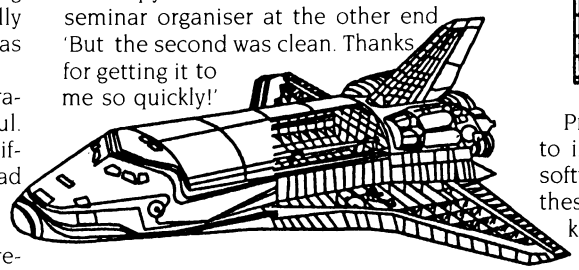
It didn't.

The two-page schedule had been prepared on the Macintosh, and had first to be transferred to the President Publisher system — data transfer between two different machines is always fraught with danger. Not any more. Step one was simply to print the schedule on the Apple LaserWriter.

I placed the first sheet face down in the President's scanner, and marvelled as it read it directly into a text file (as word-processable ASCII text, not a digitised image — this is both a scanner *and* an optical character reader) with only one error: an extra full stop. Page two was more of the same, and within seconds I had the data firmly entrenched on the President's hard disk. No cables, no modems, no breakout boxes, no comms software . . .

I switched programs from OCR to MegaFax, selected the 'convert to fax file' option, typed in the London number, and sat back to drink a cup of coffee. It had been too easy. Here's where it would go wrong, I told myself.

It seemed to work. I didn't believe it, so I tried again. Then I phoned London — 'The first copy had one line blurred,' said the seminar organiser at the other end. 'But the second was clean. Thanks for getting it to me so quickly!'

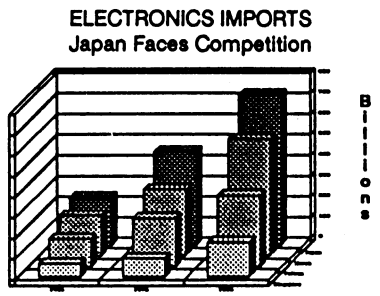


Power To The People

Read through the last 10 paragraphs again, slowly. Think about it. Just a year or two ago that technology was available only to large, cash-rich corporates. Today *you* can have it on your desk. Not as a row of expensive, dedicated machines but as a simple side-effect of your move to desktop publishing.

The converging technologies of scanning, facsimile transmission, optical character recognition, photocopying, laser printing and typesetting could have as much impact on our lifestyles as the introduction of printing, or even computers themselves.

Figure 1. *Graphics and pictures, such as those shown on this page, can be scanned from just about any source, and then combined with Ventura layouts via the MegaBuffer.*



President's publishing system, the first to integrate the necessary hardware and software, takes us to the leading edge of these technologies — and promises to keep us there.

Configured correctly, it is arguably the best desktop publishing system available anywhere in the world today. As I said in my preview of the machine, President's spectacular claims for its MegaPage system had left me slightly bemused — until I saw it in action. The system really did offer faster throughput and more potential versatility than anything I've seen.

Much of the potential of the system has been realised in recent months as new components, which were 'Real Soon Now's' when I previewed it, have been added, seemingly week-by-week, *and on schedule*.

At first it was a useful system for dabbling in desktop publishing. Then it be-

came a good system, useable in most forms of DTP and invaluable in niche areas where scanning was vital.

Now it can be all things to all people. It can scan and manipulate images more rapidly and easily than anything else on the market. It can prepare 'instant-print' layouts using its own MegaPage software. It can do more complex document design and production using Ventura Publisher. It can read text in through the scanner using advanced optical character recognition software and drop it straight into a layout — or file it away in a giant step towards the true paperless office. It can send and receive facsimile transmissions, and place the result straight into a DTP document if necessary. And its scanning and printing is so fast it can do an excellent imitation of a photocopier.

These items are the keys to its brilliance as a packaged system. Yet its dependence on bit-mapped printing, rather than a page description language like PostScript, had kept it well down my list of DTP solutions.

I should have known better. Advanced Vision Research, the US company which developed the President's integrated software/scanner/printer base, has made it so open-ended that just about any desirable adaptation is feasible.

Just replace the Canon printer with an Apple LaserWriter and you can have the best of both worlds — instant printing of images that could take hours under PostScript, plus the type, graphic and page design flexibility which makes PostScript a must for serious desktop publishing.

Killer Configuration

Using a Canon-engined PostScript printer (the LaserWriter, in fact) is the key to the 'correct configuration' I mentioned earlier.

Desktop publishing has so far been too text-based, with not enough consideration (or rapid enough development) given to getting graphics, including photographs, into the page. PostScript's ponderous handling of bit-image graphics has not encouraged users to explore this area.

President's original system, based as it was around a bit-image scanner, was at the opposite end of the scale.

And the MegaScan software, MegaBuffer card, and Advanced Vision Research flatbed scanner were so clever in concept (and execution) that President understandably concentrated its promotion on this aspect — without fully understanding either the existing page layout

Desktop publishing has so far been too text-based, with not enough consideration (or rapid enough development) given to getting graphics, including photographs, into the page.

and design capabilities or the further potential of a system with PostScript as well.

The addition of the interface to Digital Research's GEM (the IBM operating environment that was so close to the Macintosh that Apple sued DR) and Ventura Publisher, moved President out of the 'black-box' proprietary software market and into the real world. And its system became useful across a range of third-party applications.

The provision of facsimile facilities took the system a step beyond desktop publishing, while the conversion to OCR capabilities, with the availability of 400 Mbyte CD-based WORM (write-once, read many times) drives, adds yet another dimension to what is already looking like the office machine of the future.

It's time to stop and think again, slowly. We are staring a revolution in the face.

Think about the concept of scanning all the correspondence which comes into your office, filing it on compact discs, and then throwing the original away. No more filing cabinets stuffed with paper, no more throwing away old information because there is no room for it any more . . .

The next stage of the President system is a product called FileMaster — designed for the storage *and* search-and-retrieval of large amounts of information such as office correspondence and so on.

Inside the Megasystem

The way the scanning/printing combination works is the key to the system's potential in all areas, so it needs some explanation — The dual-mode driving of the printer is the major departure from traditional practice. Normally, a desktop publishing laser printer will have a controller which is a computer in itself. The Apple LaserWriter, for example, is the most powerful computer Apple makes — it has its own Motorola 68000 processor and a staggering two megabytes of memory, for page composition, downloaded fonts and so on.

The President system completely bypasses the printer controller, driving the laser engine directly. Thus it will work equally well with any Canon-engined laser, even the no-featured cheapies.

This system moves the printer controller inside the computer, into a card called the MegaBuffer which features its own 1.3 Mbytes of memory (enough to handle a complete bit-image page at the Canon's 300 dots-per-linear-inch — or 90,000 dots-per-square-inch — resolution).

When the MegaScan software reads a page from the scanner (also 300 dpi) in a maximum of nine seconds, it reads it directly into this buffer — in effect, directly into the printer! Yet while it is in the buffer, you can manipulate it on the screen (down to the pixel level), resize items, place text on it from disk, and a number of other page-layout operations before saving it to disk or pushing the print button.

When you tell it to print it does so — instantly. Anyone who has watched a laser compose a graphics/text page — or even measured the time it takes to send a megabyte of bit-image data from the PC to the printer — would find the speed almost impossible to believe. I know — when I first saw it demonstrated I though I was being conned. I wasn't convinced until I saw a change made on the page and the page printed again — at the same speed, complete with alteration.

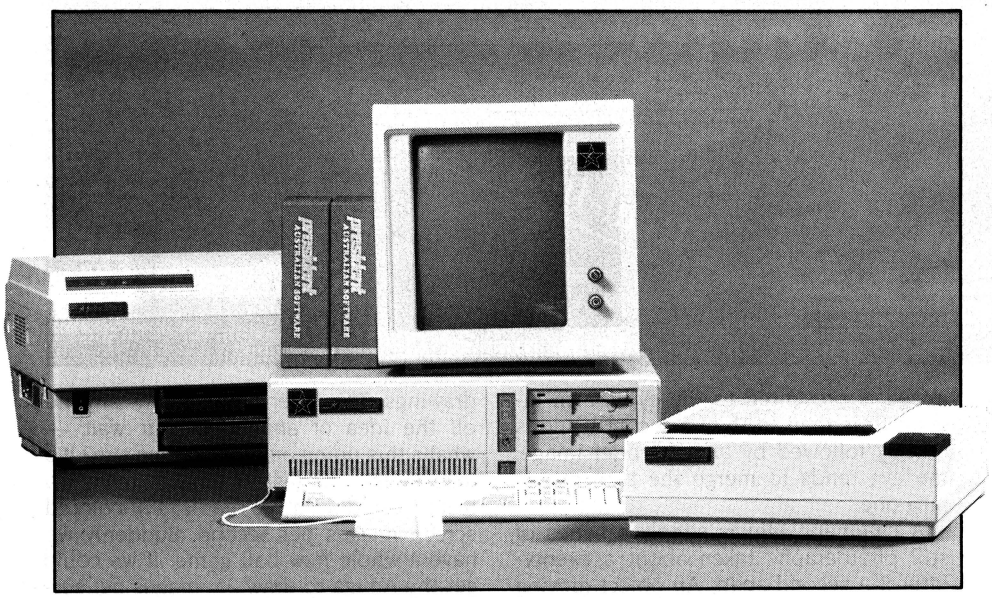
I have twice demonstrated the system at our desktop publishing seminars. The result was dropped jaws and a chorus of *wow*s, *ooh*s, and *aah*s. No-one had ever seen speed and quality like it.

The neat thing is the MegaBuffer — your in-the-PC printer controller — drives the laser engine directly through its video interface *without* disabling the printer's normal controller. So, as well as your direct connection, you can still drive the LaserWriter as a LaserWriter, using PostScript, through the serial port.

Two connections, two different approaches (each with somewhat complementary advantages and disadvantages) merged into one totally versatile system. Impressive isn't a strong enough word . . .

Why PostScript? We'll cover that in more detail next month when we talk about desktop publishing hardware, but a short description of just one of the reasons is in order.

A non-PostScript printer's typeface and



graphics memory limitations determine the quality of your desktop publishing. With PostScript, your imagination is the only real constraint.

For example, the MegaPage system has an impressive range of fonts available at this early stage — Avant Garde, Bookman, Century Schoolbook, Courier, Helvetica, Helvetica Narrow, Palatino, Times and so on — but each font takes up a disk on its own, and is limited to sizes between 6 and 30 point. Eight font families are provided as standard, but the range of sizes and styles is distinctly limited. With a bit-mapped font, each style and each size takes a file of its own.

PostScript fonts are mathematical representations which can be scaled to any size you like (I've printed a 6620 point full-stop, which filled an A3 page!), so the 11 fonts built into the Apple printer represent literally thousands of fonts on a bit-mapped system.

Megafeatures

Another nice feature of the system is MegaFreeze, a memory-resident screen-capture program, which allows you to take a 'snapshot' of your screen (at the same resolution you are running on your display) and place it in the buffer. Then you can enhance it, add text to it, use it as an illustration in a larger document, and so on. Its potential for anyone producing user documentation for PC software is enormous.

Unlike most screen-capture software, MegaFreeze is compatible with high-resolution modes, including the IBM Enhanced Graphics Adaptor (EGA) and the stunning 1280 by 800 pixel Wyse 700 display.

Up to 76 screen freezes can be placed in the buffer at one time, depending on the size option selected and the screen resolution.

MegaGEM is the software package which links GEM applications (like Ventura Publisher and the Mac-style GEM Draw and GEM Paint) to the MegaScan image/text-editing system. It consists of three separate programs: a GEM desktop accessory for scanner control and image-format translation; a printer driver for 300 dpi output from GEM applications; and a second driver for 300 dpi output from Ventura Publisher.

It allows the AVR-300 scanner to read images into the MegaBuffer from within any GEM application, including Ventura. It can also transfer pixel images between the buffer and GEM image files. It is the umbrella which makes this such an elegant, integrated system.

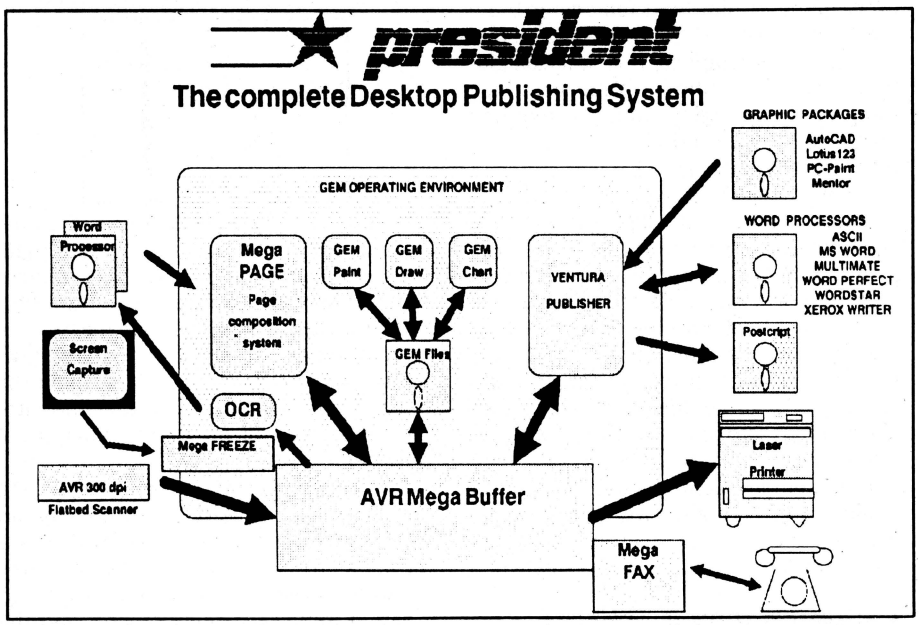


Figure 2. *This schematic of President's system was prepared using most of the components illustrated (except MegaFax).*

The Price Is Right

The complete President system comes in at $25,000 plus tax — more if you substitute the Apple LaserWriter for the Canon printer (and I strongly recommend that you do so). It may look pricey, but if you examine the components it's a real value-for-money competitor for any serious desktop publishing set-up available.

And it kills most of the competition on capabilities.

The 'base' price includes a President Publisher 286 computer (it's a real hot-rod!) with a megabyte of RAM, a 47 Mbyte voice-coil (fast!) hard disk, a 60 Mbyte tape drive, the MegaScan software, Megabuffer card, mouse, scanner, modified laser printer, GEM and Ventura Publisher. There are five package levels available for those who already have their own computer or laser printer, or who want only parts of the package. These packages start at $4000.

If you're getting into desktop publishing, you *must* have a look at this system. □

All Desktop Video needs is a personal computer, a video recorder, a dash of innovative software, a dollop of imagination, and a short stir with a two-button mouse, and presto — all singing, all dancing animated video presentations in stereo sound, with YOU as the producer and director! Gregg 'de Laurentis' Faulkner has been exploring the possibilities

THE DESKTOP Publishing revolution makes it possible to produce professional quality brochures, training manuals, magazines, whatever, in the office or home, and to do it quickly and economically. Desktop Video is part of that same revolution. Computers, like the Amiga, with their enormous graphics and sound capabilities and *fast* processors have allowed the release of a whole new generation of software — software that can process complex graphics calculations so fast that real-time animation is possible.

Traditional Animation

Now before we go any further, let's take a moment to look at what animation is all about — The human eye has a characteristic known as persistence of vision. If an image is presented to the eye for an instant (less than 1/20th of a second), and is quickly followed by another brief image, the eye tends to merge the two images into one.

A cinematic film is simply a series of still photographs taken about a twenty-fifth of a second apart. An object moving across the field of view will be captured in slightly different positions on consecutive frames of the film. When these individual images are later projected onto a screen at a rate of about 25 per second, the eye ignores the brief gaps between frames — what the eye 'sees' is a continuous moving image.

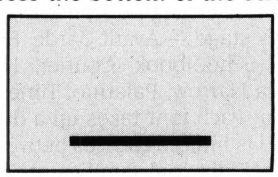
This simple fact has been used for many years by the makers of animated films (cartoons), which have been produced by extremely labour intensive methods. For example, the classic Disney animated films were produced by traditional animation techniques which require that for every frame of film (and remember there are 25 *per second*) a drawing was made, colored and photographed. A simple calculation shows that a film like Fantasia, which runs for about eighty minutes, required about 80 x 60 x 25 individual drawings — over 120,000 drawings!

I have simplified two things in the above description. First, films actually run at 24 frames per second (Australian television run at 25 per second, however). Second, the 'classic' animation technique uses a number of drawings for each frame: one for, say, the foreground, one for the background, another for the subjects and so one — up to 16 different layers. These are painted onto 'cels,' sheets of stiff celluloid. Overlaying these cels and then photographing them gives a multi-layer image comprised of the foreground, background, subjects and so on; these are moved at different rates to give realism.

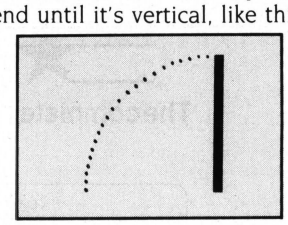
The Fastest Draw in Town!

Even a 60 second animated television commercial requires over 1500 individual drawings. This is enough to turn anyone off the idea of animation. But wait — what's this riding out of the dawn sun? It's Jose Amiga, the fastest draw in town. So fast he can draw more than 25 full-colored screen images per second. Suddenly we have a whole new ball game: if we could get the Amiga to draw 25 images per second, and if each image was slightly different from the preceding one, we've got animation!

Let's consider a very simple situation. Here we have a line drawn horizontally, say, across the bottom of the screen —



Now, let's 'animate' the line that over the period of one second. It will pivot on its right end until it's vertical, like this —



The left end of the stick rises in an arc from its horizontal position, up and right, to its final position. To produce animation, all we have to do is divide the process into 25 steps (for one second of animation) and to make a separate drawing for each of the steps. Then, when the drawings are displayed quickly, one after the other, we will have an animated sequence.

The concept of animation is easy, it's just the labour involved in producing all the intermediate step images which is a nuisance. This is where Desktop Video software comes in — it allows you to create a initial and final images, and the software fills in all the necessary steps in between.

AMBER

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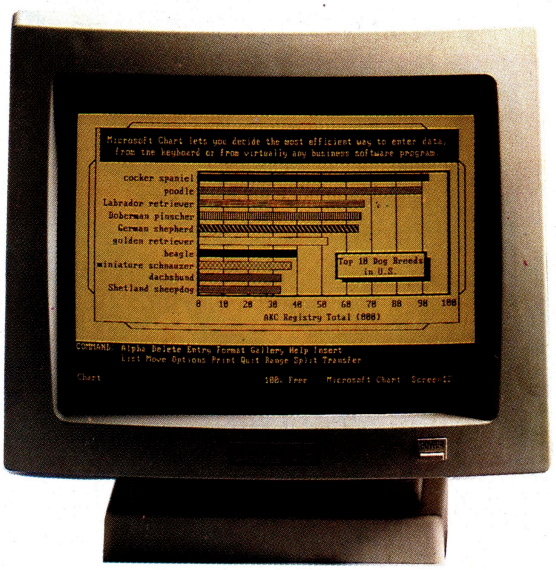

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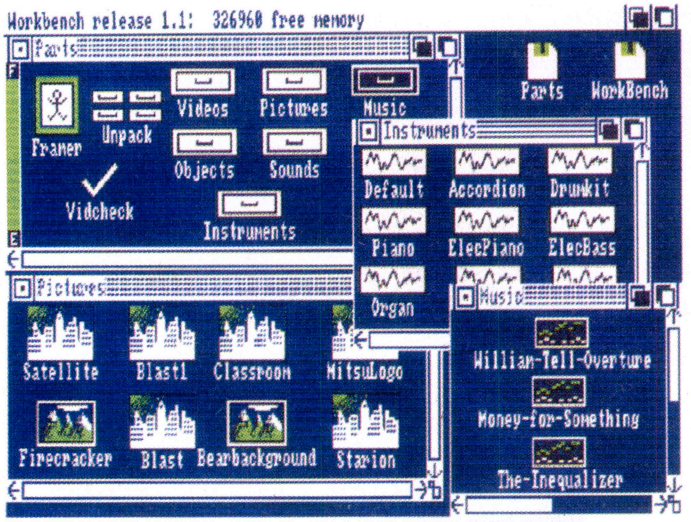
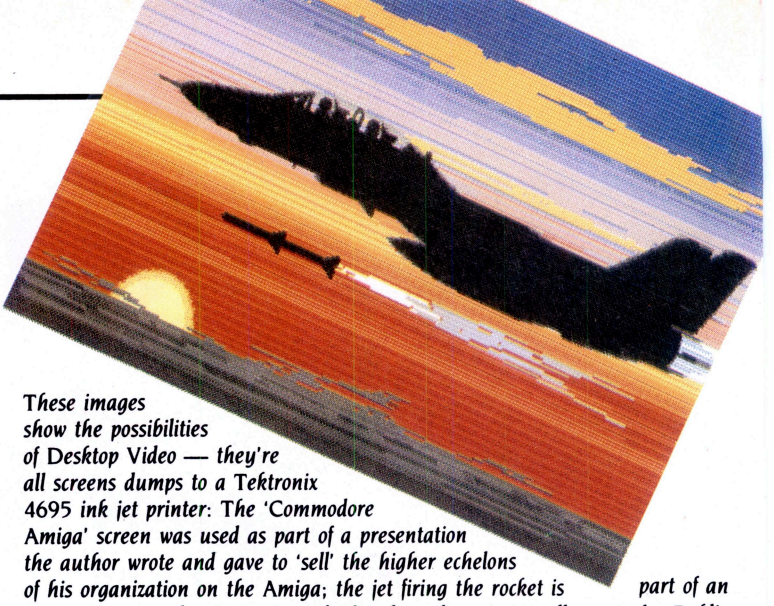
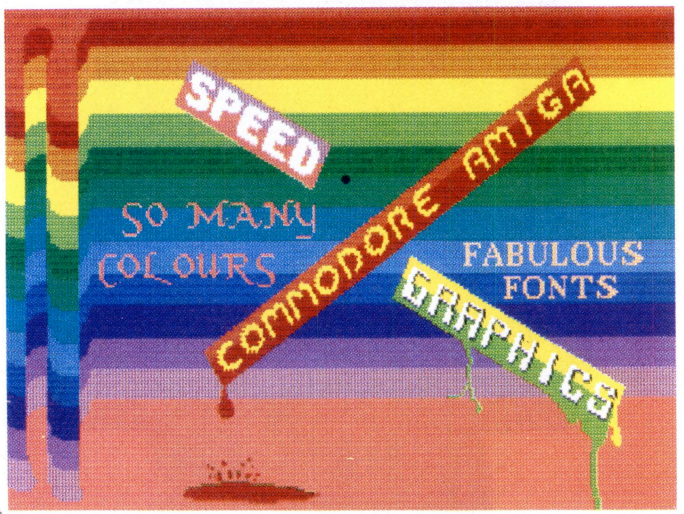
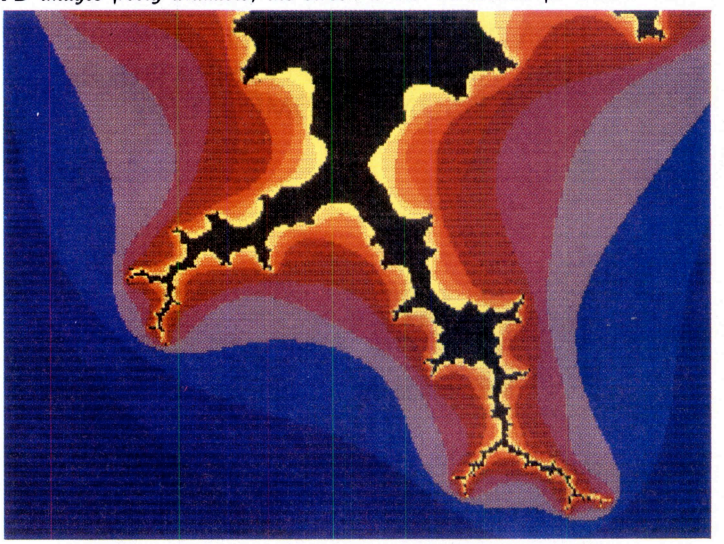




These images show the possibilities of Desktop Video — they're all screens dumps to a Tektronix 4695 ink jet printer: The 'Commodore Amiga' screen was used as part of a presentation the author wrote and gave to 'sell' the higher echelons of his organization on the Amiga; the jet firing the rocket is part of an Aegis Animator demonstration; the formless shape is actually part of a Public Domain Mandelbrot Set image in Image File Format — there are thousands of PD images freely available; the screen is the 'workbench' for Deluxe Video.





Tweens

One of the Desktop Video packages for the Amiga is Aegis Animator. The designers of Animator have introduced a concept which they call 'tweening.' A 'tween' is a time interval during which some event occurs — the event may be a change in shape, a change of position, a change of color, or a combination of all of the these.

In its simplest mode, Animator permits the user to draw a shape on screen, using the available options like line, polygon, star, and circle. The user then selects 'next tween' from a command menu and proceeds to manipulate it by moving it, reshaping, recolouring, and so on. Obviously, very complex actions may have to be made over several consecutive 'tweens'. Animator will now produce the intermediate images to provide a smooth flow of action between the starting and ending positions.

Some of the actions which Animator provides are, change color, size, move, rotate (in three axes), and 'morph'. 'Morph' is a powerful function which allows complex shapes to be made very simply. For example, during a single 'tween' a star may evolve into a space ship shape, or a circle may writhe and twist itself into the outline of a dinosaur. In fact, the possibilities are limited only by the imagination. 'Morph' quickly became my favorite function in Animator because of its versatility and its *extreme* ease of use.

Animator also permits background scenes which have been created in IFF format to be used — this is the 'standard' Image File Format for the Amiga and various painting/drawing packages such as Deluxe Paint, Aegis Images, Graphicraft and VDraw. This allows you to develop a library of backgrounds which can be used in producing animations, or conversely, you can build animation onto your favorite background scene.

Another of the new Desktop Video packages is Deluxe Video from Electronic Arts. From my early observations I would class this package as being aimed more at the advanced and business user than is Animator. Whereas Animator permits simple animations to be produced very easily and quickly, Deluxe Video appears to cater more for those who want to produce very high quality, complex animation with a little more effort.

Deluxe Video is, in operation, more closely related to the 'real world' of animation in that the construction units are called 'tracks' and 'effects' and the duration of individual units is planned on a time chart. While the approach is quite different to Animator, the end result can be very similar. Each package has its advantages and I wouldn't like to recommend one over the other in terms of quality, value for money, or operation. The distinction I make is that Animator allows me to concentrate almost solely on *what* I'm was doing, while Deluxe Video requires me to consider *how* I'm doing it. On the other hand, I feel that the time chart organization of Deluxe Video would be a big advantage to any professional or serious user. So, depending on the application, each has its use.

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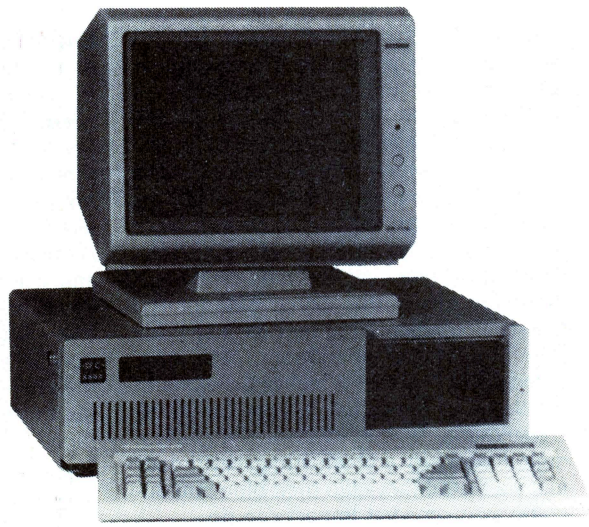

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Another Desktop Video package which I have had the opportunity to experiment with is Aegis Impact. This package is aimed squarely at the business market where it will take head-on, products like ExecuVision which runs on IBM PCs and clones. The business video market requires a package which can present business information in an easily digestible, stimulating manner. ExecuVision does a moderate job of this using IBMs limited four-color presentation and an incredibly primitive form of animation. I was staggered to find that the higher echelons of the large organization I work for, think ExecuVision is the neatest thing since digital watches and whistling keyfinders. Just wait until they clap their blue bureaucratic eyes on what Impact can do.

Impact makes graphics presentations a breeze. Its utilities can produce two or three dimensional pie-charts, bar charts, line graphs or area graphs, with segments which arrive tumbling onto the screen before settling into their allotted places. Titles and labels are produced using a range of fonts with drop-shadow and outlining available. All very professional stuff, and all very easily and quickly achieved. It's no use having a package which can produce works of art if it takes man-years to do it.

Impact also permits you to load existing IFF images as backdrops. It permits the use of eight colors on screen; if your IFF library image contains more than eight colors, Impact will give you the choice of selecting which eight to use, or to let Impact make the choice. I have to admit that frequently, when I let Impact select the 'best' eight, I was pleasantly surprised by the resulting image — sometimes better than the original.

Now, what use are these packages? Let's start with business applications. In this sphere, where the IBM PC has reigned supreme for some time, change is in the air. In my organization we often use a Sony video-projector to throw presentation material onto a large screen for seminars and the like. In order to project a computer based presentation we have had to use (until recently) an IBM PC/AT running ExecuVision software. The IBM was connected from its CGA board to a Sony PC701 adaptor which converted the IBM signal into something the video-projector could ingest. From the PC701 no less than five co-axial cables ran to the video projector, and all to produce an image with poor animation in four colors!

Enter the Amiga

As the Amiga is provided with a composite video out socket, only one lead is needed to connect to the video-projector; two leads run to loudspeakers flanking the screen for full stereo sound from the Amiga — and, end of set-up. Now the effect is overwhelming when those same executives are presented with real-time animation, using up to 4096, accompanied by broadcast quality stereo sound. Now, that's what I call a professional presentation — you with undivided attention in the best possible atmosphere, it's possible to convince them of just about anything!

For those of us who don't aspire to the heights of corporate power what use is all this fandangle? These days most of us have a video recorder, and most video recorder owners build up a collection of tapes of everything from Aunty Min's ninety-eighth birthday to that special Danish 'Art' film which we keep for its technical merit. Now we have the opportunity to produce professional introductions to our tapes. The more adventurous of us can set about producing our own animated dramas: 'The Erotic Adventures of Billy Filibuster', directed and produced by yours truly. Hollywood, here I come!

I also strongly suggest that there is great value to be gained from letting the ankle-biters get their grubby little fingers on this stuff. In particular, I found that the ten year old apprentice human around home found Animator easy to master and fun to use. In planning her animation sequences as series of 'tweens' she was forced to use those largely unplumbed depths between her ears in a logical and analytical manner. The exercise in conceptualization involved in this planning (my words, not hers) probably gave her grey matter more exercise than several days in what is laughingly referred to as our modern education system.

Speaking of education systems... What better place to make use of video packages. Using this software and a modicum of imagination a teacher could produce packages specifically tailored to the needs of a particular group of students. Imagine the students watching the chemistry experiments shown at a molecular level in an animated video presentation before actually trying the hands-on session. In this way the they would have an idea of what to expect and, more importantly, what to observe in particular. I tried a similar approach some years ago, using conventional video, but found that the gloss was taken off the students' own experiments by the hard reality of the video presentation. Animation would alleviate this problem and could provide a means of passing the information across without preempting the spontaneity of the experiment.

As an instructional medium video has no peer. Animated video has all the benefits of conventional video without the constraints imposed by reality. With animation, imagination is the prime ingredient. Any image which can be logically imagined can be produced on screen. So now, it's not only possible to make a silk purse from a sow's ear, it's easy.

The Amiga is an excellent, cost-effective tool for video animation. It is easily connected to any domestic video-cassette recorder via the audio and video connectors. (This is discussed in more detail later.) Video programs ranging from brief title sequences to feature length programs can now be produced on your desktop — thus the term Desktop Video.

Now that we have an idea of the meaning of the term Desktop Video, and we've had a brief look at some of the applications for the concept, let's take a closer look at the packages referred to earlier. All of these are available from your local Amiga dealer.

Aegis Images and Animator

This is really two packages in one. Inside the attractive cardboard box is a manual and disk for Aegis Images, which is a full featured painting/drawing package, as well as the manual and disk for Aegis Animator. The reason for this is that Images can be used as a tool to produce the IFF paintings for backgrounds, windows and masks used in Animator. Images is, in itself, a beautifully designed package with a load of excellent features which encourage the Picasso in all of us to come to the fore. It allows for effects like cycle-draw, which changes the pen color constantly through a range of colors as you draw lines. The resulting rainbow effect is spectacular enough in itself, but if you select color cycling after the image is drawn, the result is mind blowing. All the other usual options are provided — the magnifying glass, multiple brushes, patterns, airbrush, and so on. As is usual with Amiga painting packages, 32 two colors are supported and two levels of resolution are available (320 x 200 and 640 x 200).

One feature of both Images and Animator which deserves more than a passing mention is the quality of the manuals supplied. These are truly state-of-the-art technical manuals. Beautifully organised with key words in bold font, full indexing, and fast path access for the race-aheads — they are a pleasure to read and refer to. It's interesting to note that they were written on a 512K Mac. (Oh well, the excellent desktop publishing software for the Amiga was a long time coming.)

The introduction to the Aegis Animator manual sums up the package this way — 'With your Amiga and Aegis Animator you can –

- produce objects in 32 different colors from a full range of 4096 available,
- animate those objects by changing their shape, size, or color, or by dragging, rotating, or plotting a path for them around the screen,
- create up to nine different scripts and cut, or splice them together on a single storyboard,
- load backdrops from Aegis Images or similar paint packages,
- have a lot of fun.

I agree wholeheartedly with all that , but I think the last one should be first — Animator is loads of fun to use. Learning the basics of Animator takes about ten minutes, and from then on, you're on your way to producing animated sequences of all sorts. To fully master every aspect of the package could take much longer, but I don't think I'll ever get sick of it. Whoever invented 'tweening' should be in line for the Nobel Prize, and the same goes for 'morphing.'

As I mentioned earlier, the ten year old in this household has no trouble using Animator (and gaining some valuable mental exercise from doing so) and has a ball with it. I think there's a moral here somewhere. If kids can get fun out of watching cartoons –and how many don't? — imagine how much more fun (and value) they can get from producing original cartoons.

Don't get the idea that Animator is only for kids. This is a powerful production facility which is just as much at home in the workplace or the schoolroom as in the domestic domicile. Business presentations produced with Animator take on a new dimension. The driest, most boring statistics come to life with an animated graph, and the dynamic titling possible can get the attention focussed right where it's wanted. As business people become more technically sophisticated, this is the standard of presentation they are going to insist upon.

Deluxe Video

Much of what I have written about Animator also applies to Deluxe Video. In terms of its application I would class Deluxe Video as a more workplace oriented package than Animator. Part of the reason for this is the way in which Deluxe Video is structured. Figure 1 shows an example of the Deluxe Video VideoScript window where the sequence of events is laid out in scenes. The start and finish of each scene is scheduled down to a decimal fraction of a second.

Interestingly, the smallest time division is 0.03 seconds which is approximately the duration of one frame in the American NTSC television system (which runs at a rate of 30 frames per second). Ideally, for Australia the interval should be 0.04 seconds which would correspond to our 25 frames per second standard. This discrepancy suggests to me that all timings using Deluxe Video will be out by a factor of one third. From brief experiments this appears to be the case, and must be allowed for if accurate timing is required.

One major advantage that Deluxe Video has over Animator is in the use of sound. Deluxe Video is designed to handle sound tracks, either music or effects, and to chose the channel which will emit individual sounds — full stereo effects are no problem at all.

Deluxe Video is presented in a novel type of cardboard folder rather reminiscent of an undersized, but overweight, record album cover. Within this rather peculiar package is a comprehensive instruction manual, sundry guarantees and the like, and three disks. One of these is the Master Key which must to be inserted at the start of every session as a 'security precaution' (for the software house, not the user). When are they going to wake up to themselves — they are only inconveniencing and irritating honest users with all this nonsense. Especially since it says right on the package itself that an unprotected version is available for an extra $20. What a farce! Oh well, back to serious business.

Within the VideoScript window, a SceneScript window can be opened which allows the 'laying' of individual tracks and effects. In Deluxe Video, a track can be a background image, a foreground image, a music (or sound effect) sequence, or a control track. Effects include wipes, fades, cuts, and color effects. The entire contents of a SceneScript window become one effect in the VideoScript window.

The composite window shown in Figure 2 displays the three tracks used in an animated sequence where a space shuttle blasts off from its launch pad and exits off the top of the screen, accompanied by rocket engine sound effects. The Blast track is used to load the background

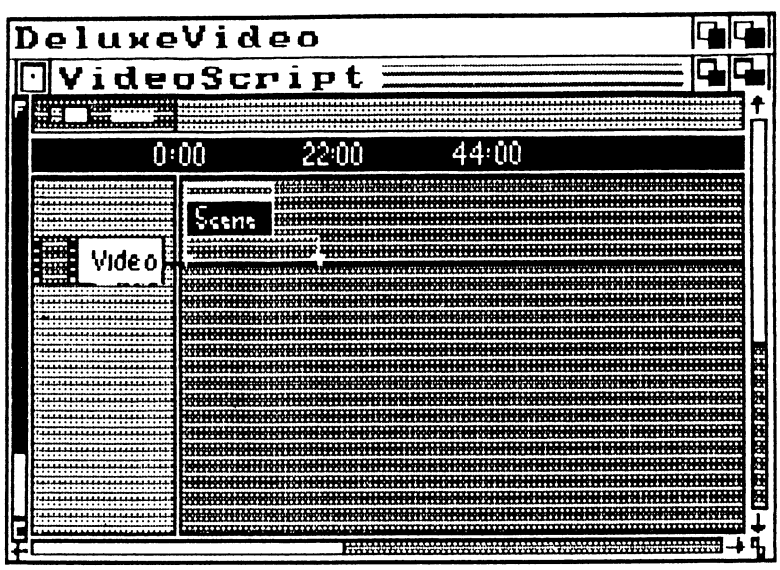


Figure 1. *The sequence of events for the video is laid out in Deluxe Video's VideoScript window. The start and finish of each scene is scheduled down to 0.03 seconds.*

image of the launch pad; it begins at 0.00 seconds and continues for the duration of the scene. The Shuttle track is the image of the space shuttle itself; the shuttle appears at a predetermined position on the screen at 0.00. Between 3.57 seconds and 7.30, seconds the shuttle moves from its initial position to its final position off the screen. The Zoom track is the sound effect of the rocket blast which plays from 3.57 to 7.54 seconds (while the shuttle is moving and briefly after it leaves the screen).

As I said previously, Deluxe Video uses a much more structured approach than Animator and for that reason is probably better suited to a business or professional environment.

Don't Read This!

The Deluxe Video manual contains an excellent description of exactly how Deluxe Video works, and an intriguing section labelled *Don't Read This!* — I'd love to tell you what it's about but I haven't read it.

Deluxe Video and Animator are both compatible with the Amiga 1300 Genlock which allows computer generated graphics/animation to be combined with a video signal from a camera, VCR, wherever, and then recorded or displayed. Both are also compatible with Frame Grabber which is a device to digitise an image from any video source and convert it into an IFF standard file. Similarly DigiView files, images digitised through a black and white video camera using colored filters, can be used with both packages.

Aegis Impact

Aegis Impact is aimed, as I have previously stated, directly at the business market. In operation it is not as flexible or powerful as Animator or Deluxe Video but it contains utilities to make it very fast and easy to work with. Production of graphs, charts and other business oriented graphics can be produced with absolutely minimum effort. As with the other packages I've discussed here, Aegis Impact can use standard IFF format image files as backgrounds so the image libraries set up under other packages can still be used.

The individual items produced by Aegis Impact are called 'slides' and the whole presentation can be easily thought of as a slide show. A variety of ways of moving from one slide to the next are provided, including fades, wipes and special effects with 'random' and 'trickle' image blocks. A full chapter of the manual is devoted to The Show Builder which enables the structuring of a complete presentation, including such parameters as the time for which a slide is displayed, and the duration of the transition between individual slides.

Aegis Impact can 'import' data from suitably prepared files for use in constructing graphs and charts. This means that a pre-prepared presentation can be updated very simply as new data becomes available. This is valuable in business as it means that only the data files, and not the whole presentation, need be updated from one presentation to the next.

The slides created by Impact can be printed (in color if the appropriate printer is available) for hardcopy distribution or for binding. The Polaroid Palette system, which many businesses already use with the dreaded IBM PC, is easily converted to the Amiga; with this facility, color prints and color slides can be made of your Aegis Impact 'slides.'

In summary, Aegis Impact is a very useful tool for the preparation and presentation of business graphics. With the Amiga's ability to interface easily to a video projector, the package becomes very useful indeed. For ease of use, speed of preparation and flexibility of presentation I would have to say there is no comparison between Aegis Impact and the competition, ExecuVision, for example. Impact is part of a whole new generation that will take us into the world of Desktop Video.

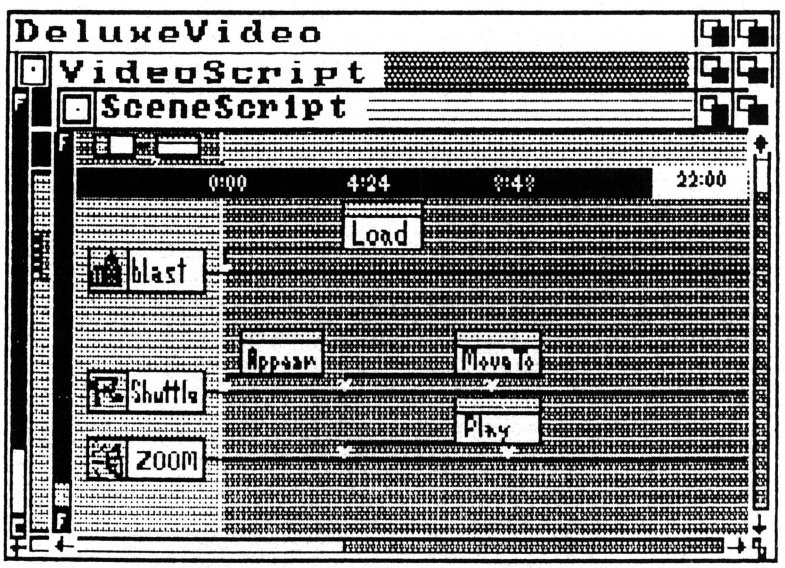


Figure 2. *A SceneScript window within the Videoscript window: This is the script of an animated sequence where a space shuttle blasts off from its launch pad and exits off top of the screen, accompanied by rocket engine sound effects. The Blast track loads the background image of the launch pad; it begins at 0.00 seconds and continues for the duration of the scene. The Shuttle track is the image of the space shuttle itself; the shuttle appears at a predetermined position on the screen at 0.00. Between 3.57 seconds and 7.30 seconds the shuttle moves from its initial position to its final position off the screen. The Zoom track is the sound effect of the rocket blast which plays from 3.57 to 7.54 seconds (while the shuttle is moving, and briefly after it leaves the screen).*

Desktop Video on the Amiga

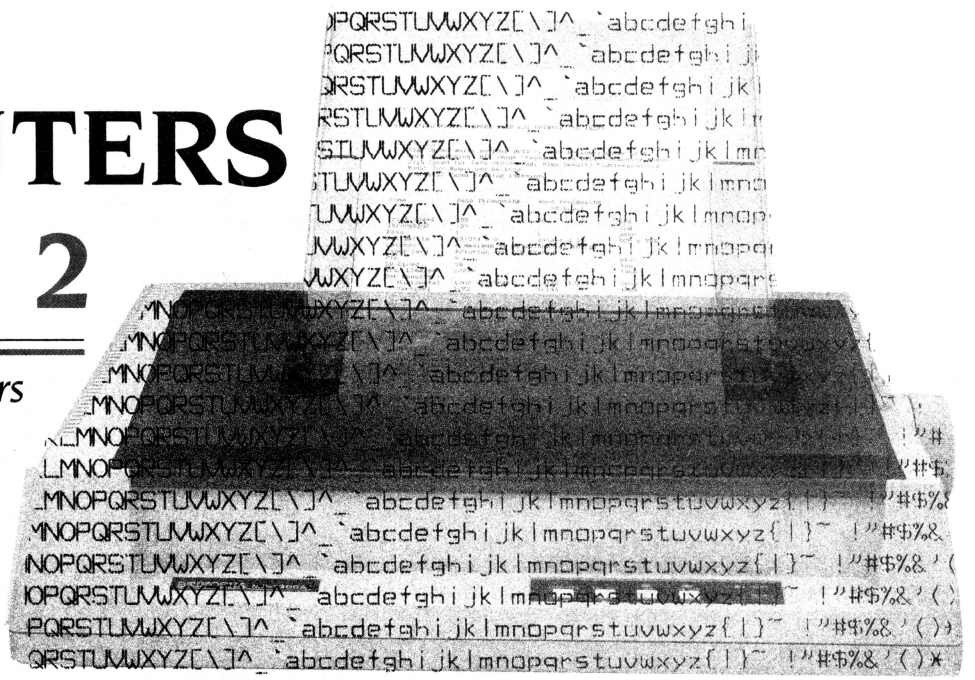
Your Amiga can be very easily connected to most domestic video cassette recorders. First establish whether your VCR has Video In and Audio In sockets. If it does, carefully check which type of connector each uses. For example, National VCRs use a BNC connector for video and an RCA connector for audio; Hitachi use RCA connectors for both. On the back of the main system box of your Amiga is a connector labelled Video and two RCA connectors labelled Audio Out.

Believe it or not, all you have to do is connect the video socket on the Amiga to the video in socket of your video recorder using a length of 75 ohm (television antenna type) coaxial cable fitted with appropriate connectors. Then connect the audio connectors in like fashion using shielded cable and the job is done.

To record, select Line or Camera input on your video recorder and let-'er-rip! But — if you are at all unsure about the correct wiring of the leads and plugs, seek technical advice. Once it's right — your on your way to Hollywood! □

PRINTERS —PART 2

— Lasers



LAST MONTH WE LOOKED AT dot matrix, ink jet and thermal printers, this month we go a little more high tech and look at the new kid on the block, the lasers (sounds like the name of a gang, anyway). And then next month, we'll check out plotters and the battling daisies — daisy wheel printers, that is. (We had intended to finish our survey of printers this month, but we were unable to test enough daisy wheels and plotters in time (primarily because of slow delivery from distributors).

Plotters aside, these printers are definitely Letter Quality — no *near* here. The daisy wheel printers have reigned for the last ten years as the ultimate in office printing, apart from the old typewriter, but the lasers printers are marching on the field with a vengeance.

According to Micro Storeboard (a survey team which monitors the sale of computer equipment in Australia), in 1986, lasers held 3.9 per cent of the market, compared to the daisy wheels' 1.7 per cent. (As mentioned last month, dot matrix printers hold 91.5 per cent.)

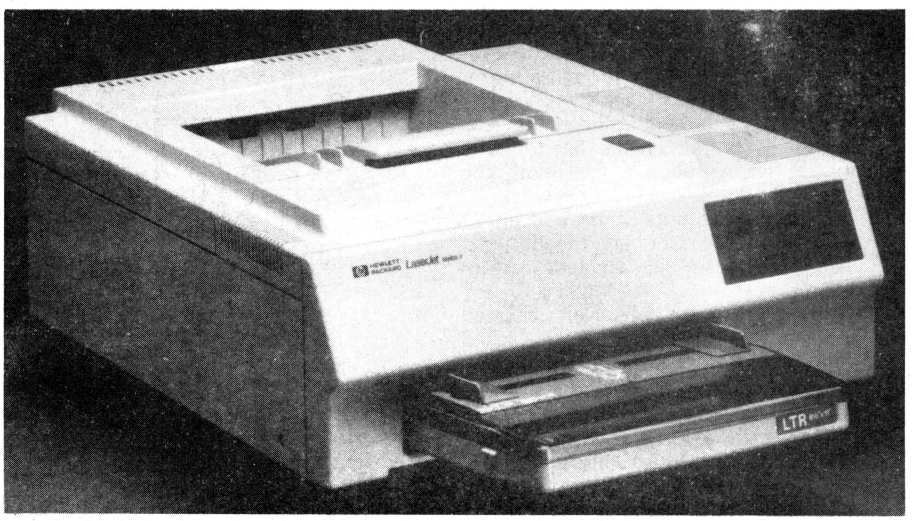
Last year's leader in the laser printer stakes was the Hewlett-Packard range of LaserJet printers which captured a healthy 62.4 per cent of the market with Apple as the only close competitor — their LaserWriter Plus took 30.5 percent of the market. That's 93 per cent of the market between the two of them!

Hewlett-Packard are set to maintain the lead after the release in March of their LaserJet II with the new Canon engine — it's smaller, quicker and lighter than its predecessors. H-P are amongst the first to take advantage of the new engine which answers the most common complaint about laser printers — their size and weight.

Laser prices are coming down as the technology matures and the competition increases; couple that with the print quality and flexibility of these machines, and you can see why the daisy wheel market is in trouble. The only advantages that matrix printers still hold are price (but the gap is closing fast) and the ability to produce colour printouts — lasers are still waiting for colour photocopy technology to reach the desktop stage.

The Laser

The technology of the laser (Light Amplification by Stimulated Emission of Radiation) has been with us since Bell Laboratories tested the maser (named after the micro wave laser) in 1960. It was first linked to computers in 1970 when Xerox and IBM built massive laser printers to match the mainframes of the time — about $500,000 retail, in 1970 dollars. The printers didn't get small enough (or affordable) for general use until October, 1984, when Hewlett-Packard released their LaserJet using the first Canon 'engine' which they had jointly researched and developed.



Hewlett-Packard's new LaserJet II series features the Canon engine which H-P collaborated on. Not only is the printer half the size of older models, it weighs 30 per cent less. The improved paper out system stacks pages face down in the order they're printed — no more re-shuffling. Envelopes and labels can be printed using a flat path through the printer.

We think of lasers as new to the office, but they have been around for years now in the form of the photocopier. The technology the two use is very similar — the main difference is that photocopiers use a scanning plate to read the image, while lasers accept information over the printer cable; and, in some cases, the photosensitive drum may be different.

With lasers printers, as with photocopiers, a light sensitive drum rolls over the paper transferring the image; the difference is that lasers 'write' directly onto the drum. This writing polarises the drum into positive or negative areas where text and white space (respectively) will be printed.

After a set area on the drum has been written to by the laser, the drum rotates past a toner cartridge. The toner, which we discovered is 'styrene-acrylic co-polymer, with carbon black and pigments,' is brushed across the drum and is attracted to the positively charged areas marked out by the laser, leaving the negatively charged areas clean.

As the drum continues its rotation, it comes in contact with the paper which picks up the toner. The page then passes through heated rollers, which melt the toner onto it. The specific temperature varies with manufacturers, but the average of 150 degrees Celsius is good enough reason not to stick your fingers where you shouldn't. The excess toner left on the drum is wiped off as it completes its a turn.

Although getting the toner onto the page is an involved process, the printers are designed to carry out the procedure from five to twenty-odd times a minute.

New techniques allow laser printers phenomenal versatility since the laser head is able to shoot at every part of the drum face in any order you like, and do it accurately. The older style photocopiers and laser printers (from three years ago), bounced the laser light off a mirror onto the drum. This was a frequent source of problems as the mirror would get out of alignment, resulting in poor quality images. This has been rectified now that lasers shoot straight onto the drum.

The great attraction of the current generation of laser printers is that the user, through software, now has full control over what is put on the page. Graphics and wordprocessing packages are beginning to make full use of this ability.

As mentioned above, the one edge that the matrix (and ink jet) printers still have is that they can produce colour images. However, Xerox released their (very pricey) 6500 Colour Graphics Printer in 1978, five years before the original Canon LBP-CX engine for monochrome printers was ready for production.

Ricoh, who have developed their own engine, has decided to hold off in the colour market until they can market a colour printer competitive in price with the matrix printers. Toshiba has taken a different approach — they've come out with a two colour printer called the Twin-Colour LP, which produces 26 pages per minute. And, a four colour printer is in the pipeline.

The main problem with colour lasers is the necessity for the printer to process the paper through four rollers to get the three primary colours (cyan, magenta, and yellow) plus black for shading, down on the page. With the work quadrupled, printing is much, much slower. Most companies are waiting for when (not *if*) the lasers will have cheap and efficient colour processing.

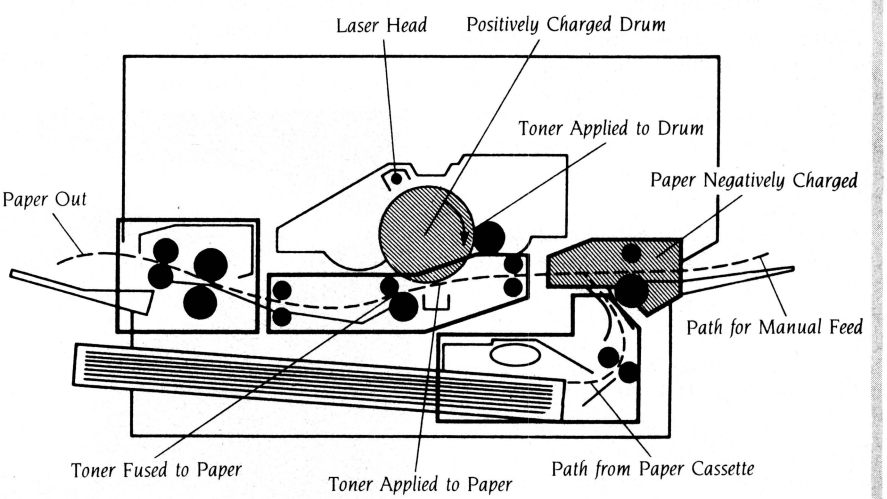
The following is only a sample of what is available at the moment — and many manufacturers are preparing for new releases in the the next few months; some of these will be from companies not even in the market at the moment.

Laser Printing

ALL LASER printers use 'electrophotography' in much the same way as photocopiers. However, copiers use a light reflected off the document to transfer the image, while laser printers use a low-powered laser directed through a mirror onto the drum (with Canon engines) or onto a belt (with the new Ricoh engines). Regardless of the engine used in the printer, the operation is essentially the same.

The four basic parts to the workings of the laser are the laser light, the electrical charger, the fuser and a plastic powder called toner.

The drum is a positively charged photosensitive cylinder which is turned neutral where it's scanned by the by the laser — The image of the text (or graphics) sent by the computer is stored in the printer's memory. The laser light then draws this stored image onto the drum, neutralising areas where the text is to be, leaving the surrounding areas positive. (While the principle of image transfer remains the same, Ricoh's belt system attracts toner to the areas that have *not* been exposed to the laser.)



The toner is a positively charged powder which is repelled by the positive areas of the drum and is attracted to the neutralised dots. These dots (or groups of dots) fill with toner and make up the image.

The printer transfers the picture from the drum to paper using those same principles of attraction and repulsion. The paper is given a negative charge as it enters the printer so it attracts the positively charged toner as it passes the drum. The page then passes between two rollers which heat up to 200 degrees Celsius, fusing the toner onto the page.

Diagram courtesy of Apple Computers.

The Hewlett Packard LaserJet II

The LaserJet Series II printers feature the new Canon engine which Hewlett-Packard collaborated on. As mentioned above, the new engine is a vast improvement on the Canon engine found in most laser printers to date.

The first thing you notice about the LaserJet II is that it is half the size of the laser printers which have graced the market until now. Even more interesting, is the reduction in weight to 23 kilos, 30 per cent less than the original. And the price is competitive with the high end of the matrix and daisy wheel market.

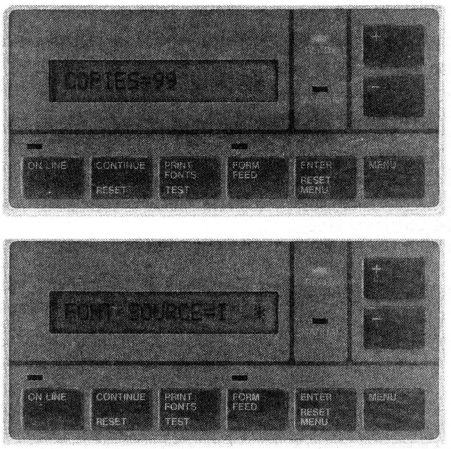
Another improvement is size — the printer, with everything extended and sitting the recommended distance from the wall (to give the cooling fan breathing space), takes up 103 by 46 cm and stands 22 cm tall; the base measures 46 by 47 cm.

With the controls at the front of the printer, the paper feed at the front, the two font cartridges at the front, and the out tray on the top, the LaserJet is easy to use — except when turning it on and off: the power switch is still around the back.

A very good design feature is the paper-out system. In normal operation the paper is fed out, face down (that means it's in the same order as it's printed, instead of backwards, as is usual with laser printers). You can also have the copy coming out the 'back' ('side,' as it's usually set up) by opening a compartment which forms a tray allowing the paper a flat path through the printer. This flat path allows for printing envelopes, which are generally too thick to wrap around and come out the top, and labels, which peel off from their backing if they're wrapped around.

On the right hand side (as it's set up) of the printer, near the base, is a tiny button which activates the 'engine test' (it's necessary to use a pen to push the button since it's inside the casing and the hole is too small to put a finger through). The test produces a page of vertical lines which show the positioning of the laser beam in relation to the page, the clarity of the printing, and whether the printer drum is marked by dirt or scratches. The first time we ran the engine test it showed a mark on the drum which was gone on the second — probably just dust.

The standard 512 Kbyte of memory is ample for most applications such as word processing, limited desktop publishing, basic graphics and spreadsheets. If you need more, there's space for a RAM expansion card on the left side of the LaserJet. Using cards, the memory is expandable to 1 Mbyte for producing full-page, 300 dots per inch graphics and additional fonts and forms, or to 2 Mbyte for full-page graphics in a multiuser environment, or to 4 Mbyte for even more memory intensive needs.



The LCD on the front control panel is used to select the primary font, lines per page, and other parameters. It also displays printer status and error messages.

Next to the out tray on the top of the printer is a release latch — the top pivots open to expose the internal workings far better than most laser printers currently on the market. This should make clearing paper jams a cinch and should also cut down on service time.

As with most Canon-engined printers, the toner cartridges are supplied with the drum, toner and developer as one clean unit which slips into the machine like a tape into a pop up cassette record. The new cartridge with the LaserJet II is an improved version with an expected life of 4,000 copies — up from 3,000. Of course, the actual number of copies you'll get out of a cartridge depends what's being printed.

Our review machine was provided with the standard font cartridge (which looked like an oversized calculator) that slips into a slot under the paper feed bin. When a test print is run, the six Courier and the six Gothic fonts print out with a message telling which cartridge port is being used. Don't go putting the printer through too many tests — it can take up to three pages to run a full test since the printer gives you the test in both a vertical (portrait) and horizontal (landscape) format.

The paper bin is typical of those found with photocopiers and accepts 200 sheets of A4 paper. The interesting part of the feeder design is the size adjustment, which is built into the hood of the paper bin (rather than on the bottom of the tray) and allows simple single sheet feeding, from A4 down to envelopes. The manual feed is activated from the control panel. Although the paper bin holds 200 sheets, the out bin only holds 100.

Speaking of paper, the manual gives the best paper to use as Canon's NP or Xerox' 4024 paper. We used normal photocopy paper and got an excellent, dark image which could only be described as 'true black.' However, there were rough patches where too much toner had been taken up by the paper and and then bubbled as it was heated.

Going the way of many printers these days, the LaserJet II has a comprehensive control panel which is easy enough to master. The menu and other programming functions are accessed by pressing the 'online' button (to take the printer 'off-line'), which responds via the LCD display with the prompt for your next step: '00 READY.'

The menu button responds to the first push by asking for the number of copies to be printed (up to 99). The number is set using the + or — keys. When the menu button is pressed a second time, the manual feed selection comes up; next, is the font source (the choices are internal, software provided or cartridge), then the font number. The last selection is the form length which is set by the number of lines on the page; the factory default is 60.

The test runs provided with the printer are comprehensive with three different modes. The first is as described above; the second looks like the standard printer test with diagonally-running characters. The third test is more comprehensive as it prints the diagonal test until the paper runs out. This revealed that the printer had a very distinctive clunking sound each time it printed a page. The printer didn't seem to mind the third test and printed the 150 pages (at 8 per minute) put through it without any change in quality or performance.

Overall, Hewlett-Packard's LaserJet Series II is an impressive machine. They've undoubtedly set the standards for friendliness, and quality printing that everyone else will being trying to beat — if they can match it first! ~$6600

President News on MegaPAGE

New Features and utilities make MegaPAGE the most advance page composition software

PRESIDENT COMPUTERS PTY. LIMITED.

An eighteen year old leading Australian owned Computer Company with manufacturing facilities on the Gold Coast Queensland, have boldly released a total systems solution for Desktop Publishing.

As Desktop Publishing requires so many hardware segments to make up a complete publishing system such as A.T. Computer, Hi-Resolution Monitor, Laser Printer, Image Scanner, Voice Coil Hard Disk, Tape Backup, Graphics Software and Publishing Software. It is most desirable, if not essential, for the customer to be able to source the complete system from one Computer House, a Company that offers total support, both hardware and software.

President Computers is offering total support on site for the complete system as well as a formal "hands on" training facility available in all major cities.

HARDWARE

Presidents hardware consists of a Publisher 286 Computer which is a custom A.T. built in Australia at Labrador, which incorporates a 80286 processor with 6-8-10 Mhz selectable speeds, a choice of 44 or 71 megabyte voice coil hard disk with fast access speeds, 60 megabyte of tape backup and a special 101 keyboard incorporates the new tactile positive keys. The standard CGA colour monitor is supplied or a choice of EGA or powerful Wyse-700 which displays 1260 x 800 lines. A specially modified Canon A1 Laser Printer comes with the system giving a full 300 D.P.I. resolution at 8 copies per minute. The AVR-300 Flatbed Scanner which is Australian Built is a key component which has the ability to scan any A4 document in an amazing 9 seconds at 300 D.P.I. the results are astoundingly high quality scans from sheets, photographs, oversized documents, books, even some 3 dimensional objects. With scanning, a flat bed scanner is essential to give all the flexibility and choice you will most certainly require.

The software President offers is the A.V.R. MegaSCAN page composition software, this software is fully interfaced with the AVR scanner, MegaSCAN is a most powerful graphics orientated package, and is simple to use. MegaSCAN can manipulate scans or text introduced from your standard word processors or scanner, to compose pages with combinations of graphics and text fonts in amazingly short periods of time. In many applications MegaSCAN will be all the software you require. MegaSCAN has many advanced operations including drawing attributes, boxes, circles, eclipses, freehand as well as operation options such as outlines, reverse image, darken, lighten, halftone white, halftone black, move, copy, scale. MegaSCAN also has functions to photo enhance photographs, paint box which allows selection of 128 different patterns, smooth which will clean up rough scanned images and rotate. The ability to store files from most ASCII type word processors, then select from the vast range of type fonts and flow your text into preset areas of your page from embedded commands (like batch files) with features like centre, left justification, right justification etc, gives MegaSCAN the power to handle most layout requirements.

Standard Features

Mega Freeze

Allows you to capture complete screen images from your monitor and store and use at will, particularly useful for creation of training manuals etc.

Mega Disk

Allows you to access the 1.3 Megabyte MegaBUFFER Ram Card for normal software applications as Ram Disk.

Mega Gem

Transfers megabuffer files into Gem files and allows scanning into Ventura or Gem.

Mega Write

Is a Word Processor which creates a window on your page layout so you can input your text with word processing features and flow the finished text file directly into your page composition without leaving MegaPAGE.

OPTIONS

MegaFAX

option is the ability to use fascimile operation from your system by adding MegaFAX, you can also scan an image, create a page layout and fax it directly from your system to any other fax machine in the world, or if you have a computer on the other end of the line with suitable recieving ability you can receive the transmission directly into your computer system and print out on a laser printer for camera ready art. MegaFAX has a number of features such as auto dial auto receive so that you can preset your fax transmissions with after hours telephone rates for transmissions and you can receive transmissions after hours and for security store them directly into your computer awaiting printout instructions at your convenience.Mega Read

Mega Read

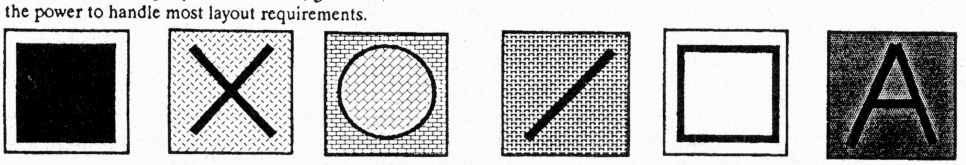
is an OCR Optical Character Recognition option due to be released shortly which allows typewritten documents to be scanned into the system converted to ASCII text files and manipulated edited and reprinted in a new format.

Training,

President has opened three full time training centres in Sydney, Melbourne and Brisbane to give XEROX Ventura publishing software "hands on" operator training programmes.

The President Certificate indicates that the operator has been trained on - Ventura Software, MegaPAGE Software, Scanning , Page makeup, Fax facilities, Screen Capture.

The Courses run over three consecutive days at a total cost of $350.00



Sydney	(02)476-2700	Brisbane	(07)846-2228	Gold Coast	(075)37-4641
Melbourne	(03)347-0555	Perth	(09)328-6522	Canberra	(062)80-4804

President News on Ventura

President Computers release the Complete Desktop Publishing System

YOU MAY NOT REALIZE IT

but if you are like most businesses and organizations, you spend a lot of time and money publishing documents.

Think for a minute do you print :- memos, technical reports, marketing and sales manuals, catalogs, financial reports, forms, promotions, presentations or newsletters to name a few.

Maybe they are not always selling aids, but they are important to you, your company, your clients and customers, so why not make your printed material look its very best, to boost your companies overall presentation.

Now most businesses, can do just that -- without the heavy cost, lengthy delays and needless complications on getting these type of documents produced professionally by graphic artists and typesetters.

NOW YOU CAN DO IT YOURSELF, with the newest and what we at President Computers think is the best Desktop Publishing System available, combining the fantastic XEROX VENTURA Publisher Software, with image scanning from our AVR-300 Flat Bed Scanner and our high speed output via President MegaPAGE Software and MegaBUFFER Card. XEROX VENTURA from President is a software package that combines efficently into the President MegaPAGE system or your existing P.C. compatible office computer system.

FULLY SUPPORTED

VENTURA is a package that is easy to use, easy to learn, and easy to intergrate into your marketing, finance, documentation or any other office routine. Xerox Ventura the fastest, friendliest, most versatile desktop publishing software yet developed, is fully supported by President Computers Pty. Limited a leading Australian Company established over 18 years.

With XEROX Ventura Series, you get the features that are making desktop publishing much more than just another hot new trend, features that propel existing P.C. technology in new dramatic ways to improve productivity throughout any organization.

XEROX Ventura accepts new or existing text files directly from a wide range of P.C. word processing programmes; they do not even have to be compatible with each other. Ventura also accepts imput in standard ASCII file format. With a click of your P.C. mouse you can simply select the word processor or other file type and flow information into the new document you are creating proposal, technical report, presentation, manual, page layout or whatever. XEROX Ventura utilising a pre-set or unique style sheet, then generates a completely formatted document and displays onto your computer screen exactly as it will appear when you print it.

XEROX Ventura in the President System makes routine changes easy too, with its built-in text editing function, after you have composed a page or a document you can add, delete, cut, duplicate, move text or compose directly all on your display copy to fit instantly, the system automatically reformats and re paginates the entire document as each change occurs. You do not have to duplicate your changes in the source text file, because XEROX Ventura publisher does that to, automatically.

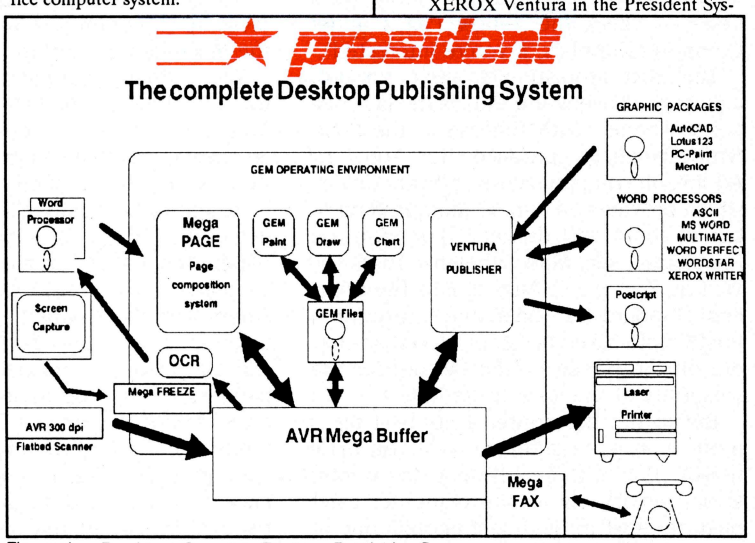


Figure 1 President Complete Desktop Publishing System

VENTURA will give you beautifully designed typeset quality documents that sustain and solidify an image of professionlism, imagination and care for detail.

Xerox Ventura incorporates graphics images into your documents from the most popular graphics, spreadsheet and C.A.D. programmes, or orginal logos, images, diagrams, photographs and some 3D objects scanned into the system on the President AVR-300 Flat Bed Scanner which scans a full A4 page at 300 dots per inch in an incredible 9 seconds. The composed text automatically flows around the graphic image or scan, and all the hypenation and justification changes are made to fit the text and scanned graphics neatly together.

You can crop, enlarge or shrink a graphic and add background texture and if adding graphics of text means that the following pages need to be rearranged and repaginated, you do not have to keep track or memorise complex codes, Ventura does it all for you, even if it means adding new pages.

XEROX Ventura also relieves you the annoying "detail work" that goes into creating and finish, professional-looking documents, because it generates running headers for each chapter or section, numbers, section and subsection, puts footnotes where they belong, and generates indexs and table of contents easily and quickly, with a minimum of involvement on your part.

PRESIDENT Training

on Xerox Ventura is available from President Computers in all Capital Cities. President Computers "hands on" courses teach setup, installation procedures, style sheet creation, text formating, graphics layout, scanning, fascimile and printing procedures. This gives the operator all the skills required to utilize XEROX Ventura. President award their Desktop Publishing Operators Certificate to those completing the Ventura course.

STOP PRESS see President at DATA 87 Centrepoint may 26 27 28 and 29

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The Apple LaserWriter Plus

The Apple LaserWriter Plus has been a big success — only the LaserJet outsells it — through Apple's ability to capitalise on the good software support which utilises the graphics potential of the LaserWriter better than most other machines.

Like most lasers, the LW Plus is heavy, weighing in at 35 kilos, but it sits well on your desk and hooks up easily to the Macintosh range by way of AppleTalk, Apple's networking system. Apple's recent success with the LW Plus is due mainly to the release of Aldus' PageMaker for the Mac and the current popularity of desktop publishing.

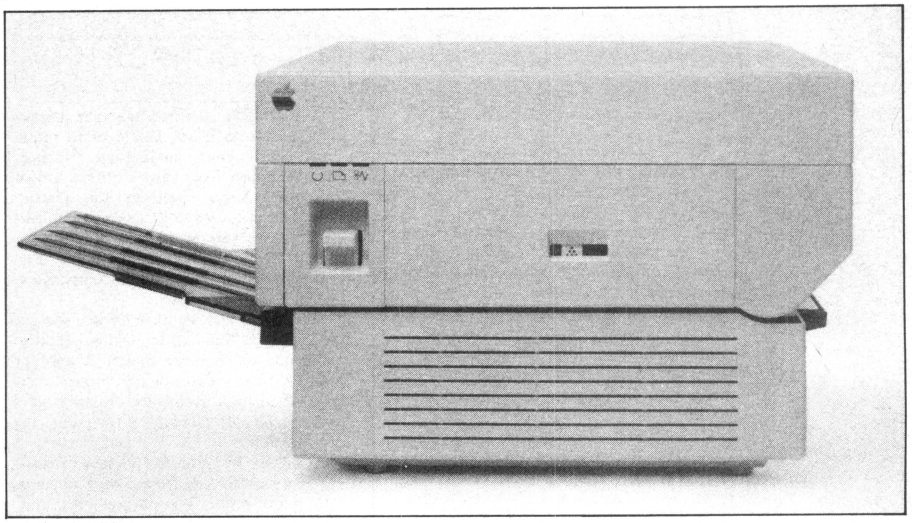
When turned on, the LaserWriter takes a while to warm up — about 2 minutes — but then it's ready to print an honest 8 pages per minute of simple text. A text files with seven font changes (not uncommon for reports), slowed the printer down to 4 pages per minute. However this laser seemed to shine when graphics tests were carried out, producing good shading and getting close to the faster output.

When the LW Plus was started up, it put itself through a self test which produced a good graphic representation of the printer, three overlapping pages with the printer's name large enough to show off the black. This test is shorter than most laser test runs; with the test, you're told the number of pages printed on the machine and the printer connection that's being used.

When a solid black figure was printed in the graphics test, we noticed that the 300 dpi runout on this machine was not so black as that produced by some of the competition. However, this could have been because this was Apple's much-used 'review machine' — it might have just needed a service.

Like most laser printers, the Canon-driven LW Plus has an easy installation method for the drum, toner and developer. These necessities are contained in a single cartridge which, like the LaserJet, is the size of a small portable typewriter. The cartridge for the LW Plus is designed for easy (and clean) installation.

The draw backs of the cartridge are that the drum and the developer can last longer than the toner: the drum can last up to 200,000 copies, the developer 8,000 and the toner is only expected to last 3,000. As mentioned before, this depends on what you use the printer for — the toner will last longer if only short letters are being runout on pre-printed stationery, for example.



The most interesting feature on Apple's Laserwriter Plus is the lack of a control panel. With the use of the PostScript language all commands are software driven, which provides an almost unlimited number of fonts and designs. The LW Plus has a 12 MHz 68000 coprocessor, half a megabyte of ROM, and 1.5 Mbyte of RAM — that's more than is found in many personal computers; until the new Macs were released, the LaserWriter was the most powerful computer made by Apple.

There are companies around which take the used cartridges and replenish them for around $100 (cartridges are about $250 new) — check the Yellow Pages under Computer Supplies, if you're interested.

The most interesting feature of the outside of the Laserwriter Plus is the lack of a control panel. With the use of the PostScript language, produced for Apple by Adobe, all commands are software driven, which provides an almost unlimited number of fonts and designs. (For more on PostScript, see Matt Whelan's *PostScript, We Love You!* in YC, August '86.) The printer's standard 11 fonts and those from PostScript looked better printed than they did on the screen — the LW utilises the versatility of the laser to its fullest.

But to run the printer at its best takes more than good software — if you drive the LW Plus with a 512K Mac, the printer slows remarkably as the computer can't push the text through fast enough due to a lack of available RAM; a Mac Plus handles the machine like they were made for each other (they were). The LaserWriter can emulate the Diablo print formatting commands, which means it can be used with many, non-Apple computers, but without the help of PostScript only 12pt Courier is supported.

Because of the design of the Canon LBP-CX (the engine used in the majority of lasers), there is provision for a flat paper path with the manual feeder at the back of the printer. This allows you to print on envelopes, and, more importantly, labels, which as mentioned earlier, can mess up the printer's internal workings if the machine isn't set up for them.

The normal paper path originates from the 100-sheet paper bin situated at the front of the printer. The out tray only holds 20 sheets, and they're fed out face up, so they need to be shuffled into order.

According to Apple the best paper to use in the LW Plus is standard photocopy paper (Xerox 4024 is the example quoted) — the manual warns against using very smooth or shiny papers. Letterhead and coloured stock, from about 40 to 150 gsm can be used (for reference, most copy paper is about 80 gsm) and it even prints on standard overhead transparency material. The bin and the manual feed both support Letter, Legal, A4, and B5 sized papers ('Letter' and 'Legal' are American paper sizes that roughly correspond to our quarto A4, and foolscap B5.)

Just to show the sheer power of one of these machines, the LW Plus has a 12 MHz 68000 coprocessor, half a megabyte of ROM, and 1.5 Mbyte of RAM. More than what you would find in many personal computers — until the new Macs were released, the LaserWriter was the most powerful computer made by Apple.

The power switch is located front, left,

half way down the printer, next to the paper out tray which is just above the paper bin. The front, right hand side, has the lever which opens the top of the printer to get at any paper jams or for changing the toner cartridge. Above the lever are three LEDs — the left (green) one is the warm up and ready light, the centre (yellow) light with its 'page' icon, shows whether the printer is processing a job by flashing, or either if the paper cassette is empty or the printer is on manual feed is shown by a steady light. The red light on the right does as its icon suggests — it flashes when there is a paper jam.

In the centre of the right hand side is the door to the toner compartment which features a window to inform you (approximately) how much toner is left.

The LaserWriter Plus is a great companion for Apple's Mac range of computers although it's too pricey for the average home user — but, how many of us can afford (and justify) a laser printer for home?

~$11,200

The Impact L800 II

The Impact L800 is Australian designed and manufactured, and it's one of the most sophisticated laser printers around (it has two 10 MHz 68000s). The L800 II is built around the standard Canon engine, but a lot of work has gone into the printer to give the user command of text fonts, styles and page layout through the control panel or the computer.

Since it uses the same engine, the paper path is very similar to the LaserWriter's and the arrangement of buttons and levers are the same. However, the Impact is made more interesting by the control panel, which is inset at the top left of the printer, and a font cartridge slot on the right hand side.

When you talk about comprehensive manuals just give Impact's manual a look, it is very indepth, and gives more detail than the average user could ever need — and it's well-organised.

When we turned the printer on, it warmed up in about 90 seconds — that's a lot quicker than the stated two minute warm up. Page throughput for a test run turned out to be around 18 seconds for the first page from the cassette, while manual feed was slightly slower at 22 seconds.

The printer accepts Legal, Letter, A4, and B5 paper and the cassette can hold 100 sheets (sound familiar?). Again, due to the optional flat path, envelopes can be

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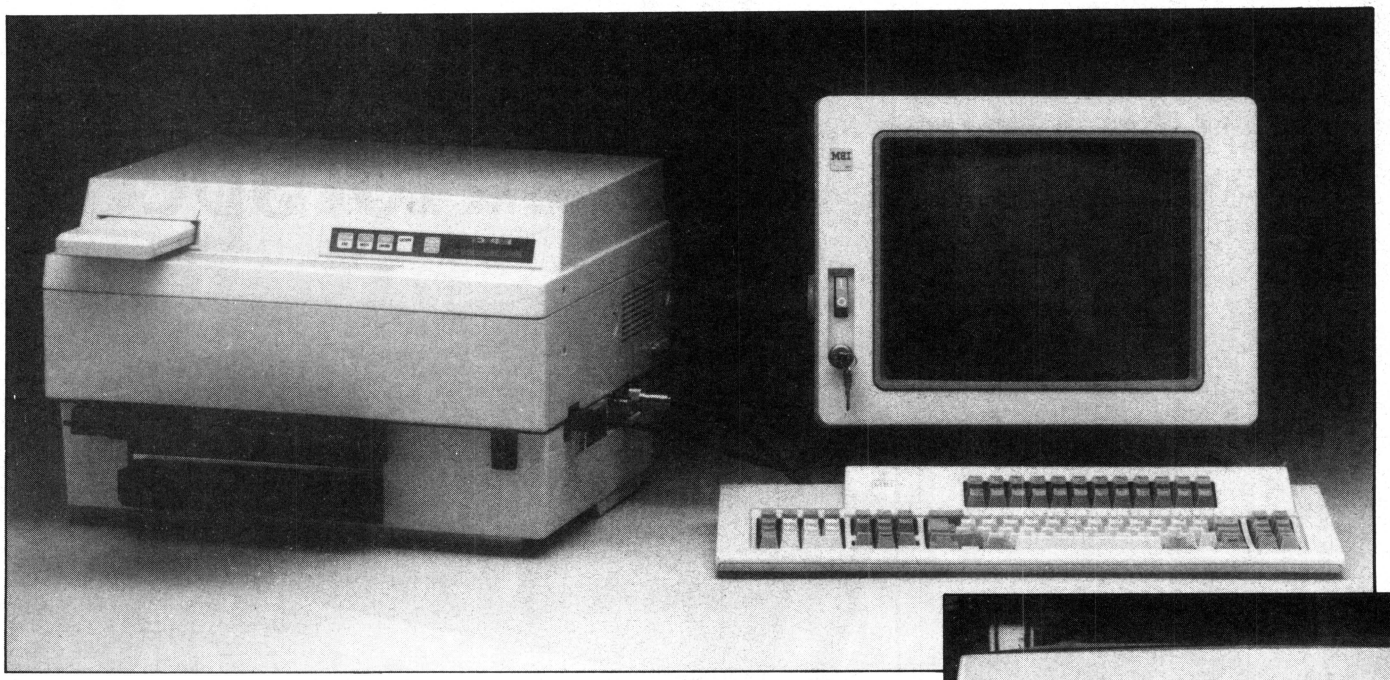

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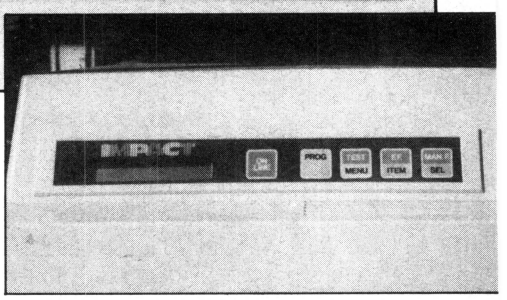


The control panel on Impact's L800 is really a comprehensive programming system that uses menus for setting page format, emulation, font, and other parameters such as auto wrap and line spacing. When the printer is warming up there is a nice Aussie touch as a kangaroo hops from left to right across the display.

used, as can labels.

The control panel is really a comprehensive programming system designed by Impact to provide versatility. The instructions on the panel are clear and easy to follow; the mode you are in is shown on a 17 character LCD. When the printer is warming up there is a nice Aussie touch as a kangaroo hops from left to right across the display. The review machine had a problem with the display — it had slipped under the casing and the first character couldn't be seen.

The 'colour coding' of the control panel was a bit confusing in that the blue Online button matches the colour of the Test, Form Feed and Manual Feed buttons — logically, that means you should be able to use them together. In fact, when the printer is online you can't do any programming since it will only talk to the computer in that mode. Once we worked that out and took the printer off-line, we were able to use the other buttons.

A problem encountered with the test run with manual feed selected, was that the printer would take both the manually-fed sheet and one from the bin and process them at the same time — one sheet had nothing on it while the other came out normally.

Next to the Online button is a silver button ('Prog') which does what it logically should — it allows access to the silver-coded Menu, Item, and Sel(ect) switch functions. Pressing Menu the first time enables the page to be formatted, press it again and you can select the emulation, and so on through font, interface, service, user and save. As an example, the page format options are shown one at a time by using the Item button and chosen with Sel. Your choices are number of copies, page orientation (portrait or landscape), lines per inch, characters per inch or form length. It's all very straightforward (and well covered in the manual).

The emulation menu offers Diablo 630 ECS and IBM, QUME, Epson FX-100, H-P LaserJet, and line printers. This allows The L800 to link up with most computers, including specialised CAD hardware.

The font menu lets you select a primary *and* a secondary font. The font selection and manipulation mode of the printer is its most interesting feature and obviously the one that's had the most effort and thought put into it. Up to 15 fonts can be loaded via the software or cartridge, including those created by the user.

Pressing the Item button (in program mode), steps through the selection of fonts loaded on the system until it reaches a 'vacant internal font area' (IFA) when the LCD will show 'EMPTY.' After selecting a font, the Item button gives a choice of: three bolds, three shades, profile (shaded type), double-height characters, double-width characters, three different italic slopes and orientation which rotates the characters 90, 180 or 270 degrees.

The Interface menu gives a selection between parallel Centronics, or serial (with all its common handshaking variables — xon, dtr and etx). Serial interface users are well catered for by a choice of 'baud' rates (the speed at which text is sent down the cable between the computer and the

printer) from 300 through to 19200 bits per second.

The Service selection from the Menu prints out all the current settings and gives such handy statistics as the software release that's in the printer, the number of copies printed, and available memory. And, there is a HEX print mode which converts all the incoming text into hexadecimal numbers.

All of the commands discussed above can be embedded in the text as it's typed into the computer — that's a powerful combination. This machine is not only ready for desktop publishing, it's ready for very specialised graphics and text printouts. ~$7500

Qume LaserTEN Plus

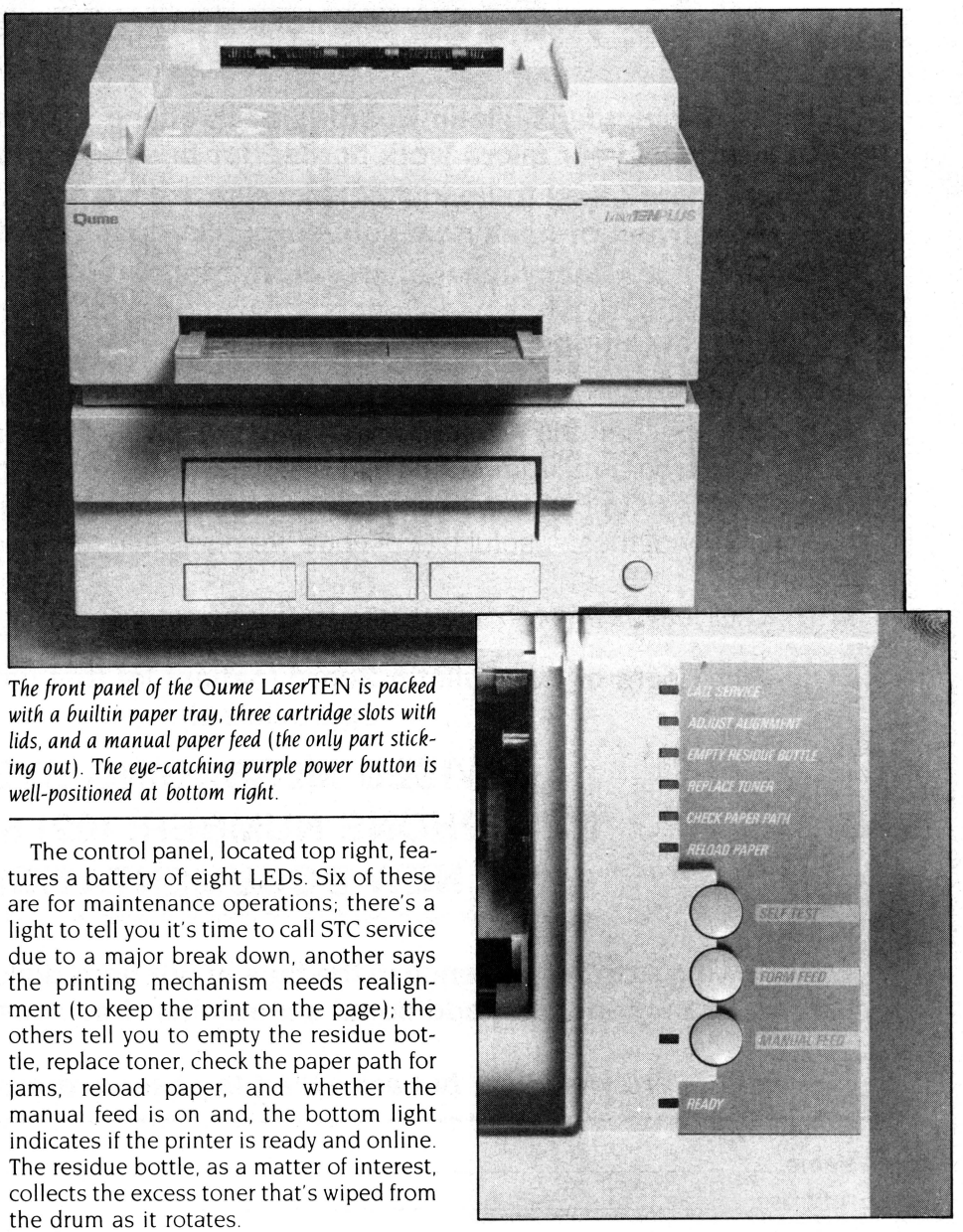
One of the most visually appealing printers around is the Qume LaserTEN Plus distributed in Australia by STC — it came in a colour co-ordinated design of pastel pinks, blues, greens and purples which brightened the office after the drab computer cream and grey printers that have cluttered the place for a while. But, it's a big machine, and looks it: it's much taller and squarer than the usual Canon-engined lasers (this one is driven by a Ricoh — also of camera fame — who developed it themselves).

The printer was actually set up for us by a technician (a standard STC service) and thank goodness — when he finished there were boxes and packing galore, strewn around. The printer comes in five parts with an easy to follow pamphlet showing how they went together; it's simple enough to do yourself, but it was nice to have a technician put it together.

After the printer was set up and the technician had given a demonstration on how toner spilled on clothing can be shaken out, we got the tape measure out to confirm our initial impression — the case measures in at 50 cm high, 44 wide, and 37.5 deep and this size is reflected in the unit's weight, 45 kilos.

Should you want to shift this beast around the office — take heed: make sure you take the toner cartridge out of the printer or tape it closed first, or you are likely to spill toner on the drum (as we did), which messes up printing for a while.

The printer's front panel is packed with a built-in paper tray, three cartridge slots with lids, and a manual paper feed (the only part sticking out). The eye-catching purple power button is well-positioned at bottom right.



The front panel of the Qume LaserTEN is packed with a builtin paper tray, three cartridge slots with lids, and a manual paper feed (the only part sticking out). The eye-catching purple power button is well-positioned at bottom right.

The control panel, located top right, features a battery of eight LEDs. Six of these are for maintenance operations; there's a light to tell you it's time to call STC service due to a major break down, another says the printing mechanism needs realignment (to keep the print on the page); the others tell you to empty the residue bottle, replace toner, check the paper path for jams, reload paper, and whether the manual feed is on and, the bottom light indicates if the printer is ready and online. The residue bottle, as a matter of interest, collects the excess toner that's wiped from the drum as it rotates.

There are three buttons on the panel with the LEDs. These are used for a self test,- which produces a status report, a form feed, and to select manual feed.

The LaserTEN has been designed with the user in mind — everything can be done from the front. Around the back is the slot that takes the cards to set the printer up for parallel or serial printing (there are no separate ports). The only other item of interest on the back is the engine test button — and the power socket.

The engine test showed how fine the printing can get on a Ricoh-driven laser — the lines are only half the thickness of those from the Canon-engined lasers test-

The LaserTEN's control panel features a battery of eight LEDs. Six of these are for maintenance operations; there's a light that says it's time to call STC service, another says the printing mechanism needs realignment (to keep the print on the page); the others tell you to empty the residue bottle, replace toner, check the paper path for jams, reload paper, and whether the manual feed is on and, the bottom light indicates if the printer is ready and online.

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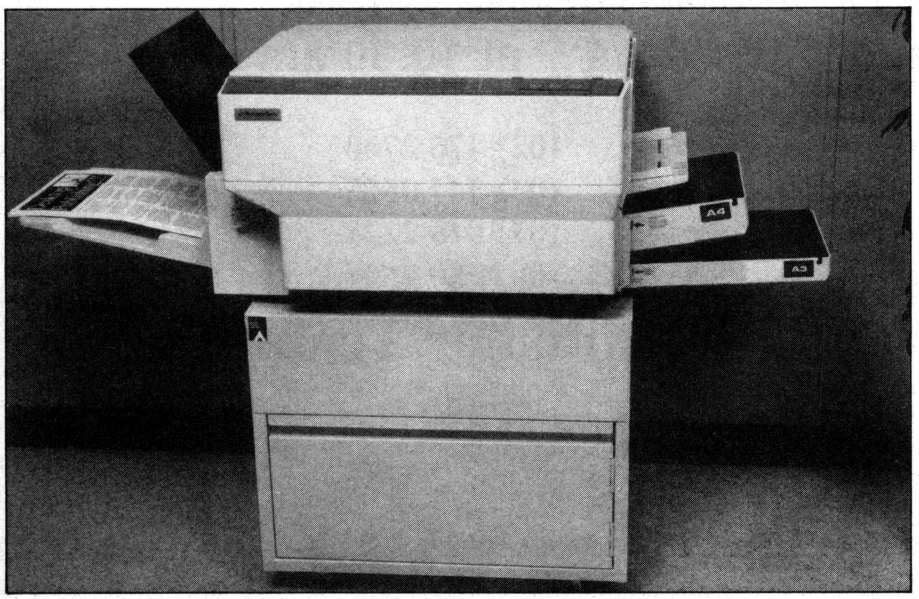
ed. The lines, about half a point thick, didn't all print perfectly, however; there was a noticeable 'dropping out' of toner in some lines. Whether this was caused by improper fusing to the paper, or simply that Ricoh have reached the limit of the technology, we can't say — in any event, the lines are much thinner than anyone would normally need. The engine test also showed lines running off the page to the right, indicating bad alignment of the drum and laser head. The alignment can change during normal use, but in this case the problem was probably caused by a rushed installation.

mix up to 209(!) fonts per page.

A comprehensive booklet on command sets is included with the printer; these allow you to use the computer to design your own fonts and graphics and customise the format of the output. These override the defaults, which are set in a nifty snap in module.

These modules are used to provide compatibility with particular computers and software, and to link the printer into multi-user systems and networks. For Macintosh users there is the Qume ScriptTEN which will be released in July.

~$8400.



PostScript coupled with a heavy duty Toshiba engine turning out 26 ppm makes the Dataproducts LZR 2665 a printer for those who are serious about desktop publishing — $30,000 worth of serious.

The printer takes A4 or B5 (foolscap) paper in the 250 page bin, and the same paper in the manual feed tray. Pages are deposited 10 per minute, face down in the output bin at the top of the printer, which stacks 100 pages. Taking the tray out needs getting used to — it's necessary to lift and then slide the tray out, while with most printers it's simply a matter of pulling it out.

The print resolution varies from 75 dpi up to the standard 300, according to the emulation and application. The LaserTEN can also print on transparencies and labels.

The printer has 128 Kbyte of RAM which can accept downloadable fonts. There are 11 fonts resident in the machine, plus the full IBM ASCII set. If you're into fancy printing, Qume have made it possible to

The Dataproducts LZR 2665

So far we have been looking at the low to medium priced range of laser printers — naturally these are the most popular with small businesses and home users. Dataproducts' LZR 2665 Text and Bit-Map Graphics Printer takes us into the high-end, $30,000 league packed with heavy duty, high throughput equipment.

The LZR 2665 is the top of the range in the Dataproducts 2600 series and definitely has some features worth highlighting (and worth looking for in lesser machines). The first thing that struck us when we saw the LZR 2665 was the fact that it takes 13 sizes of paper up to, and including, A3.

At first glance, you might think this printer was a photocopier — there are dual paper bins (for A4 which takes 500

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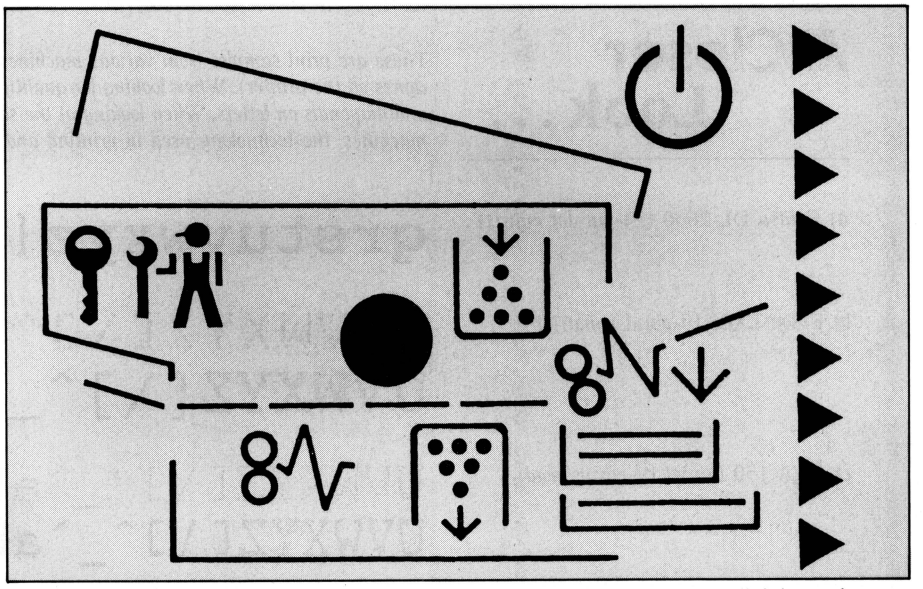
sheets, and for A3, 250sheets) on the right and the large outtray on the left (which takes 250 sheets).

Although the LZR 2665 is smaller than the LaserWriter Plus, measuring in at 68 x 60 x 41 cm, at 80 kg, it's certainly in the heavy weight division — in fairness, that's with the paper cassettes fully loaded and a full developer charge. The wider drum and other mechanicals for printing on A3 paper undoubtedly contribute to the weight, too.

Dataproducts sensibly provide a trolley which stores paper and toner and assorted maintenance tools and, most importantly, allows you to move the printer around.

The versatility of this printer and its ability to print on a greater range of paper sizes, is matched by its phenomenal 26 pages per minute throughput. This is almost quadruple the output of the printers we've looked at so far — not only that, but maintenance cycles are far longer.

The toner and maintenance cycle are



The trouble-shooting display from the LZR 2665. *With a quick glance the user can tell if the machine is warming up, out of paper, jammed, misfeeding, needs a service or the toner bag replaced. The* LCD *also doubles as a status display, showing the selected cassette and feed mode.*

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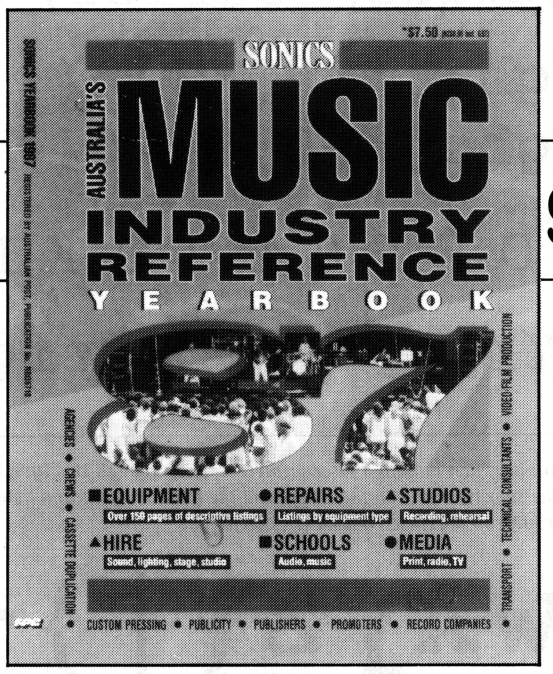

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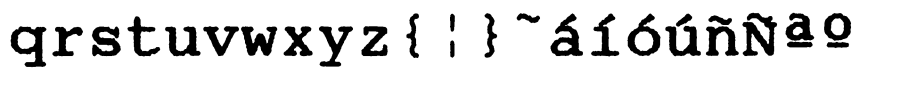
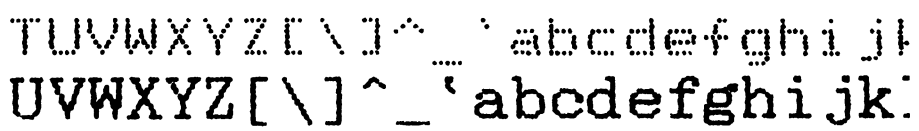
A Closer Look...

These are print samples from various machines, magnified to 200 per cent of the original (as it comes off the printer). When looking for quality in printing, pay particular attention to the curves and diagonals on letters. When looking at the samples, bear in mind the comparative prices of the machines, the technology used in printing and the job the printer is intended to do.

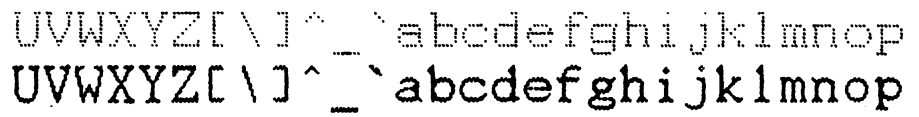
a) Fujitsu DL 2600 (24-*pin dot matrix*)



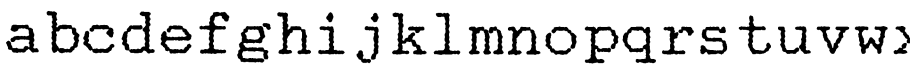
b) Epson LX86 (9-*pin dot matrix*)



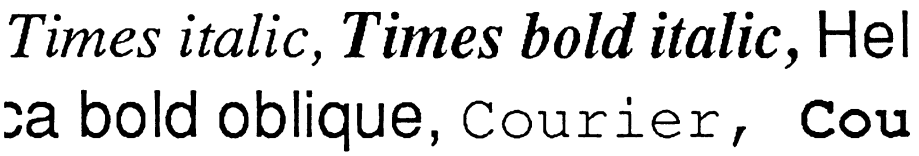
c) AWA 150 Ink Jet (9-*nozzle head*)



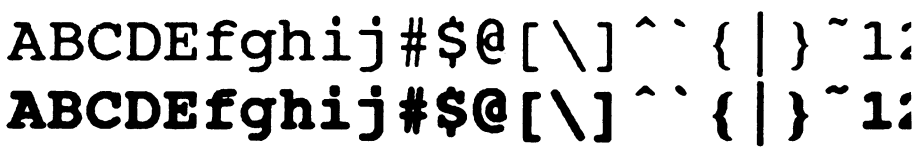
d) Epson IX-800 (9-*nozzle head*)



e) Apple LaserWriter Plus

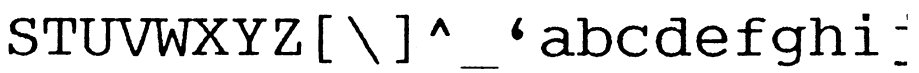


f) Hewlett-Packard LaserJet II



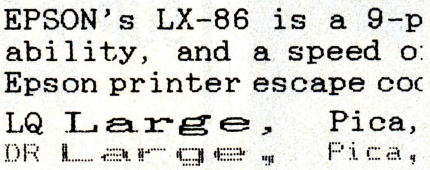
g) Impact L800 II (*laser printer*)

h) Qume LaserTEN Plus

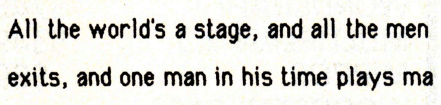


This is part of what you pay for when buying a laser printer — Even though this type has been magnified 4 times, notice the smooth curves on the letters and the consistent printing from letter to letter. (The sample was printed on a Hewlett-Packard LaserJet.)

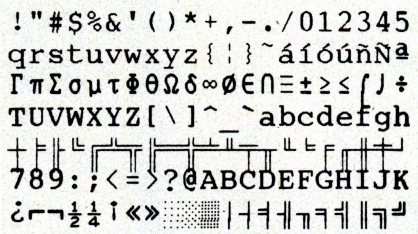
These are test samples as they would come straight off your printer. Note the overall density of the type and the appearance of ascenders and descenders on individual letters.



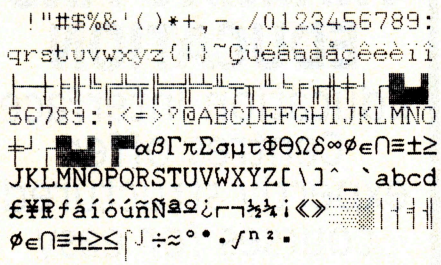
a) Epson LX86 *(9-pin dot matrix)*



b) Apple ImageWriter II (9-pin dot matrix)

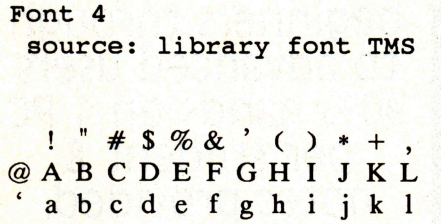


c) Fujitsu DL 2600 *(24-pin dot matrix)*

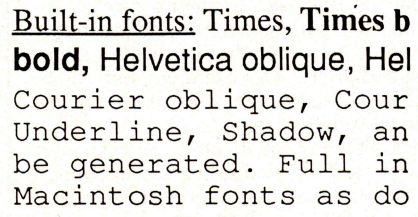


d) AWA 150 Ink Jet (9-nozzle)

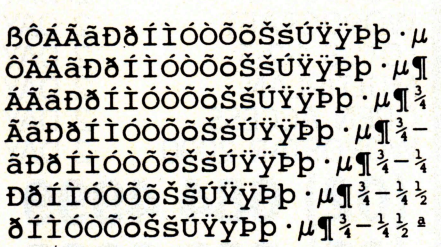
e) Epson IX-800 *(9-nozzle ink jet)*



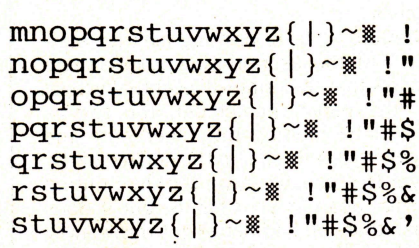
f) Impact L800 II *(laser printer)*



g) Apple LaserWriter Plus



h) Hewlett-Packard LaserJet II



i) Qume LaserTEN Plus

rated at 80,000 pages per month, compared to 3,000 to 5,000 for most laser printers. The mechanics of the printer are rated for three million pages or a five year life at 50,000 pages a month, compared to most printers with a recommended maintenance cycle of 100,000 pages. The drum's life (80,000 pages) compares favourably with that of the Canon engined lasers — the $800 price tag for a new drum gives a better per page cost than the Canon's.

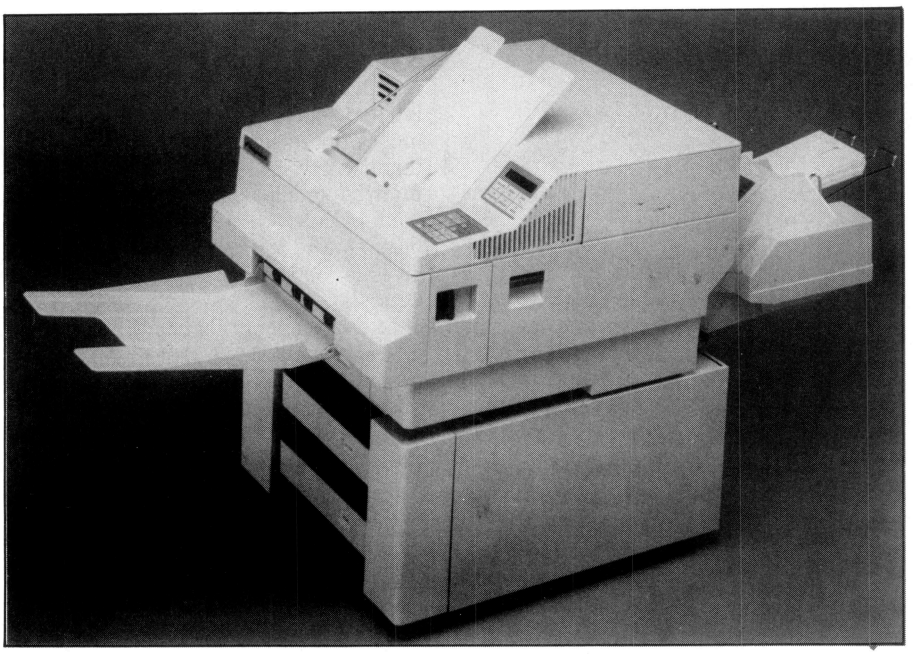
At the heart of this heavy duty printing is the Toshiba A740 mechanism taken from the proven Toshiba 7800 series of photocopier engines.

Like Apple, Dataproducts have gone the PostScript way — so much so that most Mac software treats the LZR 2665 as if it were a LaserWriter. PostScript sits nicely in the half a megabyte of ROM which also contains four font families (Courier, Times, Helvetica and Symbols) giving 13 different fonts. Behind it all is the same Motorola 68000 processor used in the LaserWriter — except, it's faster, claim Dataproducts, because there's no wait state in their processor. It runs at 9 MHz and manipulates 2.5 Mbytes of RAM for 300 dpi images.

Speed is not the only area where Dataproducts have made a difference. When looking at the output from the LZR 2665 we couldn't help but notice the rich blacks which were produced. The reason for this 'true' black is the printing operation which is a reverse of the Canon process. Instead of drawing the image on the drum, the Toshiba system starts off with an energised or black drum and then draws in the white spaces. The result is a very sharp image with no problems caused by large areas of toner, unlike the grey which is produced by the LaserWriter and the Impact when asked to print large black areas.

Connection for the LZR 2665 is through a Centronics parallel or RS 232 serial port and AppleTalk. The control panel couldn't be simpler — three buttons (Maintenance, Select, and Test) and an LCD showing any current trouble spots.

Even as a high end printer, the LZR 2665 can prove very economical for those who can justify the initial outlay. This is offset, though, by the fact that the printer is three times as fast, and only costs a third as much to run as other, lower priced lasers and the Toshiba engine's duty cycle is 30 times that of Canon-engined machines — this is a printer for those who take their desktop publishing seriously.



Dataproducts also produce the 12 page per minute LZR 1230 laser printer for up to A4 size paper, priced around $7000. This machine can emulate the Diablo 630, Epson FX-80 and H-P LaserJet plus the IBM PC graphics set (in Epson mode). The five builtin fonts can be expanded, italicised, made bold, underlined, shadowed and sub- and super-scripted. And it's rugged — its duty life cycle is rated at 600,000 pages.

What to Watch For

When you go spending so much money on a laser, or any other printer, you want it to work for a long time without costly breakdowns.

Setting up your printer can be confusing, especially if you try to set up without reading the instructions. Even though you may do the right thing, reading the instructions carefully and even following them implicitly, you can run into problems with manuals which frustrate new owners with missing information or description of operations which confound even the experts.

Before the machine breaks down — in fact, before you buy it — find out the name and location of the company that will be servicing the printer; most distributors leave servicing to a third party. If you don't have a servicing contract and are having problems with the printer, then ring the distributor for technical help.

Before you buy a laser printer, check the ease of setting up and ensure that help will be available if it's needed.

While shopping around ask whether the printer can be moved easily and how much table space it requires. Most of the lasers are so heavy that you won't want to move them once they're in place and when set up, they may need space at the back for circulation from the cooling fan.

Most laser printer manufacturers have attempted to make the necessary changing of the toner cartridge as easy and clean as possible. Changing can be as simple as pulling out the old cartridge and slotting in another (with the Canon engined printers, for example), but watch out for those printers which have elaborate cartridge systems.

(Don't worry too much if you get toner on yourself — it doesn't eat anything. Shake off the excess toner over a rubbish bin and then use cold water to remove what's left — hot water will melt the toner sufficiently to stick to your skin or clothes.

Beware — laser printing isn't for eternity. With the laser printing process there is a risk that the print will eventually 'peel off' the paper. Remember, the text is formed by melting the toner onto the paper, so it only sits on the surface of the page. This doesn't mean the the printing will fall apart in your hands, but it does mean that you had better not throw away those disks — you may need another print out after about five years. □

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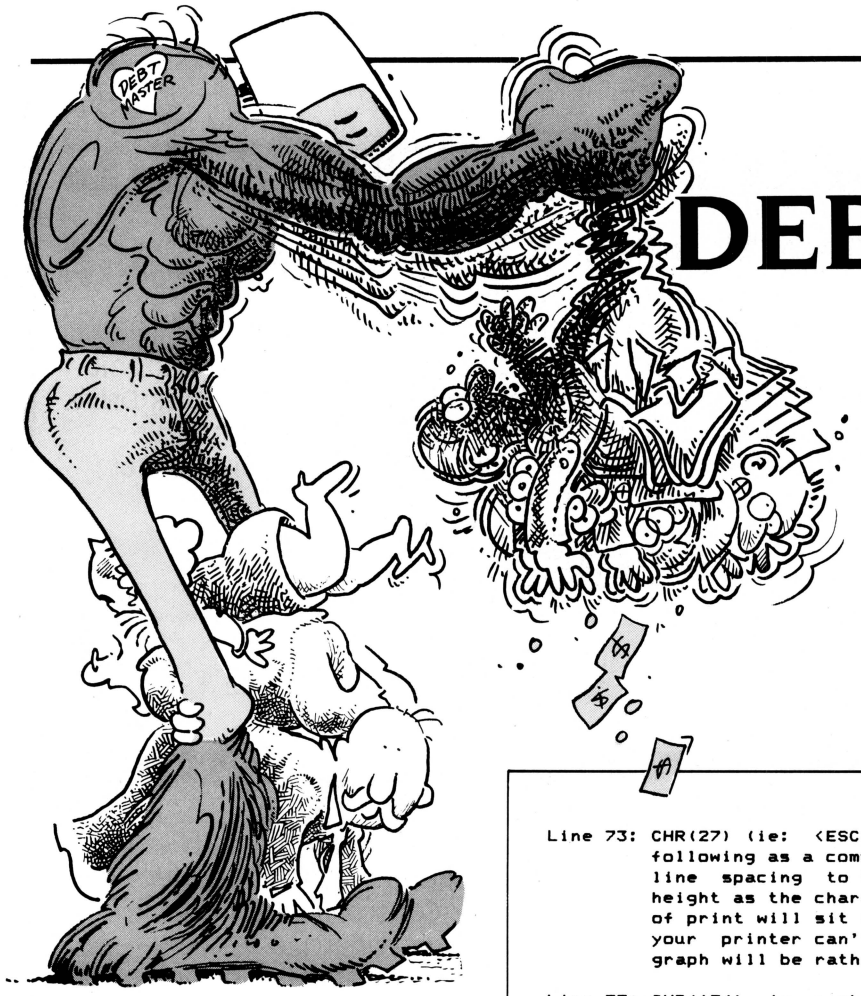


DEBTMASTER

— Part 7

In this bonus instalment of the ultimate debt recovery program, Lindsay Ford shows how you can create a graph of all those lovely profits you've earned!

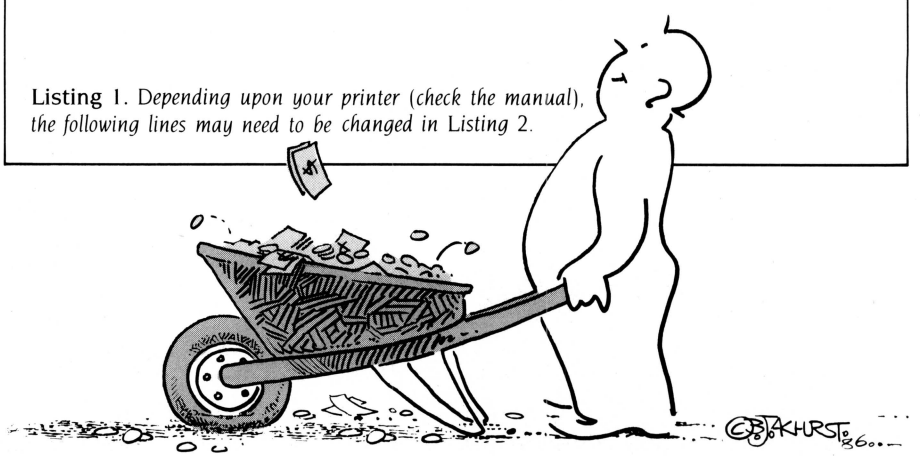
SINCE THE FIRST OF this series appeared in the November '86 issue, I've been deluged with mail from readers who are using Debtmaster in all sorts of businesses. Some just expressed their appreciation (*thank you for taking the trouble to write!*), but others suggested extra options they thought could have been included. Perhaps the most common theme was 'can I get a yearly overview of my business performance?' The answer is 'yes', but only by modifying the software and adding a subprogram we'll call BUSGRAF. It displays or prints a graph of your receipts over a 52-week period and a chart giving the monthly totals — an example is shown in Figure 1.

What use are income graphs? If you don't know, then you shouldn't be in business! They're invaluable for forward-planning as they let you identify recurrent economic trends and adapt your business to suit. Figure 1 was created by the DUMMY program (given below) rather than from 'real life figures, but it does illustrate the point. Let's pretend it relates to a real business called Big Bertha's Bikini Boutique —

□ The graph shows a decline in income over the colder months. If Bertha's business was in Victoria, then maybe she could stock thermal underwear from

```
Line 73: CHR(27) (ie: <ESC>) tells my printer to treat the characters
         following as a command sequence. CHR(65) tells it to set the
         line spacing to CHR(6)/72" (ie: 6/72"). This is the same
         height as the characters themselves, meaning that each line
         of print will sit right on top of the next. Omit this line if
         your printer can't adjust its line height (in that case the
         graph will be rather long and narrow!)

Line 75: CHR(156) is a character in my printer's graphics set. It
         prints an unbroken vertical line the height of one character.
         CHR(124) creates a similar character on the screen. Your
         printer and BASIC interpreter will have their own graphics
         sets - see towards the back of your manual or test it with:

           OUT#1 ON: FOR X=1 TO 255: PRINT X; "="; CHR(X): NEXT X:
           IN#0: OUT#0 then press <RETURN>

         Omit the OUT#1 command to view the BASIC character set. If
         none of the characters are appropriate then use "l" (lower
         case "L") instead of CHR(156) or CHR(124)

Line 77: MicroWorld BASIC displays a shaded cursor block with CHR(255)
         and my printer produces a solid block with CHR(17). Test as
         per line 75. Use "#" if there's nothing more suitable.

Line 79: As per line 75, but note that there is no semi-colon.

Line 81: CHR(27) CHR(50) reverses the effect of line 73, returning
         line spacing to the default value of 1/6".
```

Listing 1. *Depending upon your printer (check the manual), the following lines may need to be changed in Listing 2.*



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```
00001 REM -------- BUSGRAF ---------
00002 POKE 140,1: GOSUB 98: CURS 0: CLEAR: SD10: STRS(20000):
      DIM A0(102),A1(64): B=0: F1=0: K5$="": FOR X=1 TO 102:
      A0$(X)="": NEXT X: REM Set up arrays & strings
00003 OPEN "I",6,"DATE.DBT": IN#6 ON: OUT#0: OUT#0 OFF :
      INPUT K3$,K4$,P,D,U: IN#0: OUT#0: CLOSE 6: REM Load
      date file
00004 IF U>999 THEN LET B=1: U=U-1000: GOTO 4: REM Set access
      flag (B=1) if from Main Menu. Reset U.
00005 ON ERROR GOTO 6: OPEN "I",6,"BUSGRAF.DBT": IN#6 ON:
      OUT#0: OUT#0 OFF : INPUT F1,K5$: FOR X=1 TO 64:
      INPUT A1(X): NEXT X: REM Load graph file (F1=0 if none)
00006 ON ERROR GOTO 0: IN#0: OUT#0: CLOSE 6

Menu display

00007 GOSUB 108: GOSUB 103: CURS 18,3:
      PRINT "<<< ANNUAL RECEIPTS GRAPH >>>"\\
      " What do you want to do?": GOSUB 109
00008 PRINT\SPC(17);"Include this PAID ledger  <I>"\
      SPC(17);"List Graph to Printer";SPC(5);"<P>"\
      SPC(17);"List Graph to Screen";SPC(6)"<S>"\
      SPC(17);"Initialise new Graph";SPC(6);"<X>"
00009 GOSUB 103: PRINT SPC(22);"Press <ESC> to Abort";
00010 CURS 40,12: PRINT "Key <*>"; CHR(8); CHR(8);
00011 GOSUB 93: IF X=27 THEN 60: REM <ESC> key?
00012 X=10: IF K0$<>"X" THEN 39 ELSE GOSUB 107: REM Skip
      if not key <X>

INITIALISE (Key <X>)
Caution if file already present

00013 IF F1=0 THEN 22 ELSE CURS 4,12: INVERSE: PRINT
      " CAUTION: ";: NORMAL: PRINT
      " There is already a GRAPH file on this disk."\
      SPC(14);"If you continue you will erase it."
00014 GOSUB 103: PRINT "Continue (Y/N)? *"; CHR(8);
00015 GOSUB 93: IF K0$="N" THEN 7 ELSE IF K0$<>"Y" THEN 15
00016 GOSUB 103: PRINT "Are you SURE (Y/N)? *"; CHR(8);
00017 GOSUB 93: IF K0$="N" THEN 7 ELSE IF K0$<>"Y" THEN 17

Add 1 to year

00018 GOSUB 103: PRINT
      "Add 1 year to current starting date (Y/N)? *"; CHR(8);
00019 GOSUB 93: IF K0$="N" THEN 22 ELSE IF K0$<>"Y" THEN 19
00020 K0$=K5$: GOSUB 115: N=N+1: IF N=100 THEN LET N=0
00021 IF N>60 AND N<84 THEN 38 ELSE 27: REM No illegal years

Get new graph date

00022 GOSUB 108: CURS 1,12: PRINT [A127 32]: CURS 22,3:
      PRINT "<<< NEW GRAPH DATE >>>"\\
      " Please enter new date;": GOSUB 109
00023 CURS 27,7: PRINT "DAY:@@@@@**"\SPC(26);"MONTH:@@@**"\
      SPC(26);"YEAR:@@@@**": GOSUB 103
00024 Z=7: GOSUB 104: L=W: IF L<1 OR L>31 THEN 38: REM Day
00025 Z=8: GOSUB 104: M=W: IF M<1 OR M>12 THEN 38: REM Month
00026 Z=9: GOSUB 104: N=W: IF N>60 AND N<84 THEN 38: REM Year
00027 RESTORE 121: FOR X=1 TO M: READ Z: NEXT X: IF
      FRACT(FLT(N)/4)=0 AND M=2 THEN LET Z=29: REM Get days
      in current month. Allow for leap years.
00028 IF L>Z THEN 38 ELSE GOSUB 111: REM Error if too many
      days for month
00029 K0$=STR$(L): K1$=K0$(;2)+"/": K0$=STR$(M):
      K1$=K1$+K0$(;2)+"/": REM Create date string in K1$
00030 K0$=STR$(N): K0$=K0$(;2): IF LEN(K0$)=1 THEN
```

Listing 2. *The* BUSGRAF *sub-program for graphing business performance from Debtmaster.*

March to November to even it up. If she was in Queensland, then she could always open a travel agency as a winter side-line to cash in on all those frozen Victorians! These suggestions are a little light-hearted, but they illustrate a point ignored by too many businesses that suffer from seasonal (or annual) variations: *Diversify!*

□ Bertha took her holidays in February. Was her manageress overworked? Incompetent? Fiddling the till? The reduction in income is obvious, allowing such problems to be detected and cured. Bertha should replace her manageress and take her holidays in June!

□ What caused the peaks and holes in the graph? Maybe the peaks coincide with weeks in which there were public holidays? In that case extra stock should be on hand next year. Obviously something also needs to be done about those weeks in which there was no income.

Sausage Machines

The value of an annual income graph should now be obvious, but the system described so far can't create one. Why? Because programs like Debtmaster are designed only to handle current accounts. They are referred to in the trade as a *sausage machine* because they work just like one — they take in raw materials (debtor details) at one end, spit out a few by-products on the way (overdue accounts) and then dispose of completed sausages (accounts) in the sausage bin (PAID ledger) when you've finished. When the sausage bin is full it is taken away (printed) and the individual sausages are forgotten.

If Debtmaster is to compile a graph of receipts over a twelve month period, it must remember the pertinent details of all paid accounts (not those you've written off or cancelled). These are taken from the PAID ledger at the time it is printed and stored in a file named BUSGRAF.DBT. This forms the heart of our graph routine, however, it needs software to process it. This is where BUSGRAF comes in.

BUSGRAF

As BUSGRAF is likely to be used infrequently, I didn't bother including a prompt for it in the main Debtmaster menu. Enter it by pressing CTRL-B. It will also run automatically after a full ledger (52 entries) is printed.

When BUSGRAF starts, a menu will appear, displaying the Starting Date of any graph file then on disk and allowing you to

access four options or to hit Esc to return to the main menu.

Initialise New Graph

The graph file holds a date and 64 items of data (52 weekly and 12 monthly receipt totals). Each time a full paid ledger page is printed the totals are updated, but once the graph file contains a whole year of entries (or if there isn't a graph file on the disk), you'll have to initialise a new file to hold next year's entries.

Press X to operate the 'Initialise' option. If there is already a graph file on the disk then a CAUTION message will appear, warning you that it will be erased if you continue. If you decide to forge ahead, the program will then ask if you want to add year 1 to the last graph date. If you answer Y to this and the last graph was set to commence on (say) 1/7/87, the new graph will begin on 1/7/88.

If there was no graph on file on the disk or you chose not to add a year to the last graph date, then the program will ask you to enter a new date. The prompts are the same as those used in the main DEBT program (Part 1), except that you can't borrow from the previous date. The date you enter will be used by the program as the first day of the period covered by the graph.

Once the date is entered correctly, the new graph file will be saved to disk. Any old graph file will first be renamed a BUSGRAF.BAK, then the program will return to the menu.

The Rename function lets you retrieve a file that you accidently erase with this option. Remove your Debtmaster disk from drive A and boot up Basic from your System Master Disk. Now put Debtmaster back in drive A and type DISKRESET A and hit RETURN (*do this twice as the command isn't always reliable*). Now, type KILL BUSGRAF.DBT RETURN to erase the file you just initialised and NAME BUSGRAF.BAK as BUSGRAF.DBT to reinstate the original file.

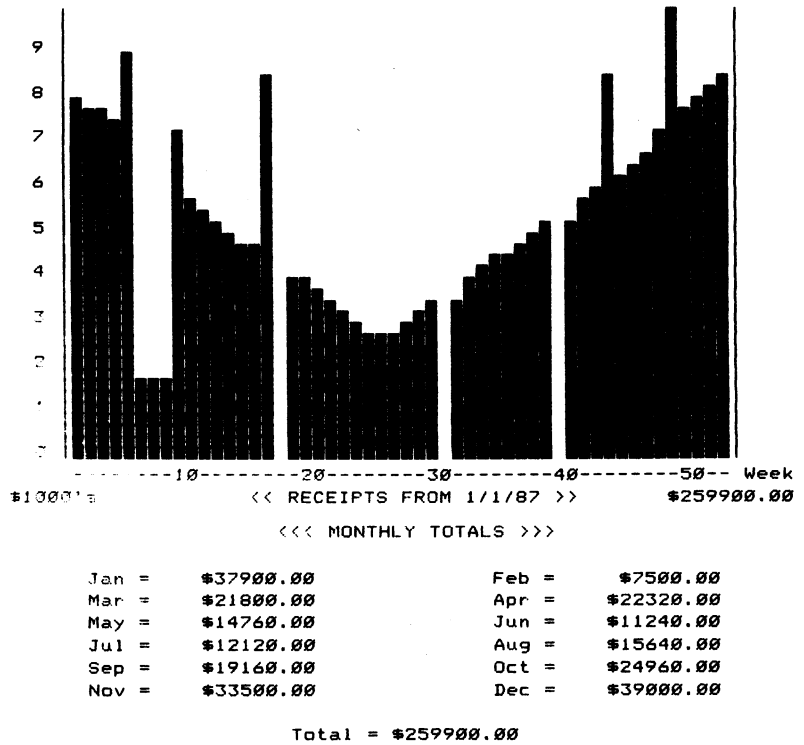

Figure 1. *Sample receipts graph and monthly table created by Debtmaster when used with the* BUSGRAF *program.*

```
      LET K1$=K1$+"0": REM adjust for years 2001-2009
00031 K1$=K1$+K0$
00032 CURS 1,12: PRINT [A127 32]: CURS 21-LEN(K1$)/2,13:
      INVERSE: PRINT " New graph begins on "; K1$; " ":
      NORMAL: REM Allow user to check date
00033 GOSUB 92: IF X=78 THEN 7 ELSE IF X<>89 THEN 33

Manipulate graph file/s

00034 ON ERROR GOTO 36: KILL "BUSGRAF.BAK": REM Erase any
      old .BAK file
00035 GOSUB 103: PRINT SPC(7);
      "<< Renaming old graph file as BUSGRAF.BAK >>";: CURS 0
00036 ON ERROR GOTO 37: NAME "BUSGRAF.DBT" AS "BUSGRAF.BAK":
      REM Name any existing .DBT graph file as a .BAK file
00037 ON ERROR GOTO 0: GOSUB 98: F1=FLT(J): K5$=K1$:
      FOR X=1 TO 64: A1(X)=0: NEXT X: GOSUB 91: GOTO 2: REM
      Create new .DBT file and end

00038 GOSUB 103: CURS 24,16: PRINT "<<< INVALID DATE";:
      GOSUB 102: GOTO 7: REM Date error message

INCLUDE PAID LEDGER IN GRAPH FILE

00039 X=7: IF K0$<>"I" THEN 62: REM Skip if not key <I>
00040 GOSUB 107: IF B=1 THEN GOSUB 103: PRINT SPC(14);
      "<<< NOT AVAILABLE FROM MAIN MENU";: GOSUB 102: GOTO 7:
      REM Abort if accessed from Main Menu (B=1)
00041 IF F1=0 THEN GOSUB 103: PRINT SPC(17);
      "<<< NO GRAPH FILE ON DISK";: GOSUB 102: GOTO 7: REM
      Abort if no graph file on disk (F1=0)
```

Include Paid Ledger

The I option takes all of the amounts actually received (not written off accounts or the like) from the Paid Ledger and adds them to the relevant graph file entries. It then operates in the same way as the PRI program used to, allowing you to delete the ledger page you just printed (see Part 4). It will not operate if you accessed BUSGRAF from the Main Debtmaster Menu, but only after you have printed a full ledger page with the Print option (other-

```
00042 GOSUB 98: OPEN "I",6,"PAID.DBT": IN#6 ON: OUT#0:
      OUT#0 OFF : FOR X=1 TO U+2: INPUT A0$(X): NEXT X: IN#0:
      OUT#0: CLOSE 6: REM Load Paid ledger

Process Paid Ledger

00043 C=0: H=0: T=0: FOR E=1 TO 52: K0$=A0$(E+2): GOSUB 115:
      GOSUB 111: F2=FLT(J): IF FRACT(FLT(N)/4)=0 AND M<3
      AND C=0 THEN LET C=366 ELSE LET C=365: REM Get each ledger
      entry and set F2 to date. Set C=number of days in year.
00044 IF F2<=F1+FLT(C) THEN 46 ELSE IF H=0 THEN CURS 13,12:
      PRINT "Some accounts on this ledger page are dated"\
      SPC(17);"after the end of the graph period": CURS 0
00045 H=1: GOTO 52: REM Ignore entry if after end of graph
      period. Display message to alert user (line 44)
00046 T=T+1: A0$(E+2)="": IF F2<F1 THEN 52: REM Erase entry.
      Ignore it if it's before start of graph period.
00047 X=LEN(K0$)-1: K1$=K0$(;X,X): IF K1$="C" OR K1$="S" OR
      K1$="W" THEN 52: REM Ignore entry if money not actually
      received.
00048 Y=INT((F2-F1)/7)+1: IF Y>52 THEN LET Y=52: REM Set Y to
      graph file variable for this date
00049 IF X>15 THEN LET K0$=K0$(;X-15): REM Get money section of
      ledger entry (next line homes in on the actual figure)
00050 X=SEARCH (K0$,"$"): IF X>0 THEN LET K0$=K0$(;X+1): GOTO 50
00051 F6=VAL(K0$): Z=M+52: A1(Y)=A1(Y)+F6: A1(Z)=A1(Z)+F6: REM
      Add money to weekly (Y) and monthly (Z) totals.
00052 F6=FRE($): NEXT E: IF T=0 THEN GOSUB 103: PRINT SPC(12);
      "<<< NO PAYMENTS FOUND IN GRAPH PERIOD";:T=52: GOSUB 102:
      REM Error message if no accounts in graph period (T=0).
      FRE($) is for crash protection.

Erase Ledger page

00053 GOSUB 103: K0$="": IF T>0 AND T<52 THEN LET
      K0$=", part in graph period (G)": REM Add extra prompt
      if SOME of ledger entries are after graph period
00054 GOSUB 103: PRINT "Erase Ledger page (E)"; K0$;
      " or Abort (A)? *"; CHR(8);: REM Print prompt
00055 GOSUB 93: IF K0$="A" THEN 7 ELSE IF K0$="E" THEN
      FOR X=3 TO 54: A0$(X)="": NEXT X: T=52 ELSE IF K0$<>"G"
      OR T=52 THEN 55: REM Get key. Abort if <A> or scrub
      ledger or first 52 entries if <E> (as PRI program)
00056 GOSUB 98: IF T=U THEN KILL "PAID.DBT": U=0: GOTO 59
00057 T=0: OPEN "O",6,"PAID.DBT": OUT#6: FOR X=1 TO U+2:
      IF A0$(X)<>"" THEN PRINT "'"; A0$(X); "'": T=T+1
00058 NEXT X: U=T-2: OUT#0: CLOSE 6: REM Save any remaining
      Paid ledger entries
00059 GOSUB 91: B=1
00060 GOSUB 98: IF B=1 THEN OPEN "O",6,"DATE.DBT": OUT#6:
      PRINT "'"; K3$; "',"'"; K4$; "',"; P; ","; D; ","; U:
      OUT#0: CLOSE 6: REM Save adjusted date file. U has any
      access flag (+1000) removed and number of printed
      entries deducted.
00061 GOSUB 98: RUN "DEBT"

DISPLAY or PRINT GRAPH

00062 X=9: V=1: IF K0$="S" THEN 63 ELSE LET X=8: V=4:
      IF K0$<>"P" THEN 11: REM Loop if invalid key, else set
      V=1 if "Display" or V=4 if "Print"
00063 GOSUB 107: GOSUB 98: OPEN "I",6,"BASE.DBT": IN#6 ON:
      OUT#0: OUT#0 OFF : FOR X=1 TO 9: INPUT S,K0$: NEXT X:
      IN#0: OUT#0: CLOSE 6: REM Get printer parameter in S
00064 F2=0: F6=0: FOR X=1 TO 52: F6=F6+A1(X): IF A1(X)>999999
      THEN LET A1(X)=999999: REM Limit size of graph variables.
      F6 is total annual earnings.
00065 IF A1(X)>F2 THEN LET F2=A1(X): REM Get largest weekly
      total in F2. Then error messages (next 2 lines)
```

wise accounts could be included several times over.) Several error messages may occur –

NOT AVAILABLE FROM MAIN MENU: Self-explanatory;

NO GRAPH FILE ON DISK: Use the X option to initialise a graph file since you can't store data in it if it doesn't exist;

NO PAYMENTS FOUND IN GRAPH PERIOD: None of the payments in the PAID Ledger were made within the last twelve month period covered by the graph. Perhaps you entered the wrong date when you initialised it?

SOME ACCOUNTS AFTER GRAPH PERIOD: You've probably entered a new graph year during the time the PAID Ledger was filling up. You'll have the option of deleting only those entries covered by the graph (rather than the whole page) to avoid losing entries required for next year's graph file. Remember to (manually) cross them off the printed ledger page.

List Graph to Screen

Pressing key S causes the weekly graph to be printed on the screen (it need not contain a full year of entries, although there must be some data in it.) Pressing any key takes you on to a display of the monthly totals. Press a key again to return to the BUSGRAF Menu. Note that the weekly graph and monthly table use different date calculations to best suit the program to the widest possible range of businesses. The monthly totals accurately reflect earnings in each calendar month, but the graph is on a true weekly basis. Thus the 5th week begins 28 days after the graph commences (in our example it covers the 29th of Jan to the 4th of Feb '87).

List Graph to Printer

Pressing P lists the graph and table to the printer determined by the Printer parameters set in the system Base. After a brief delay you will be asked to press RETURN when the printer is ready. Check that the paper is properly aligned, then press RETURN to continue or ESC to abort.

Program Entry and Conversion

The rules for program entry are the same as outlined in Part 1. Do all of your programming on a backup disk as BUSGRAF could play havoc with your ledgers if it isn't working correctly. You can put it on your Master disk as soon as you're certain its bugfree. If you're converting to another Basic then note the SD10 command in

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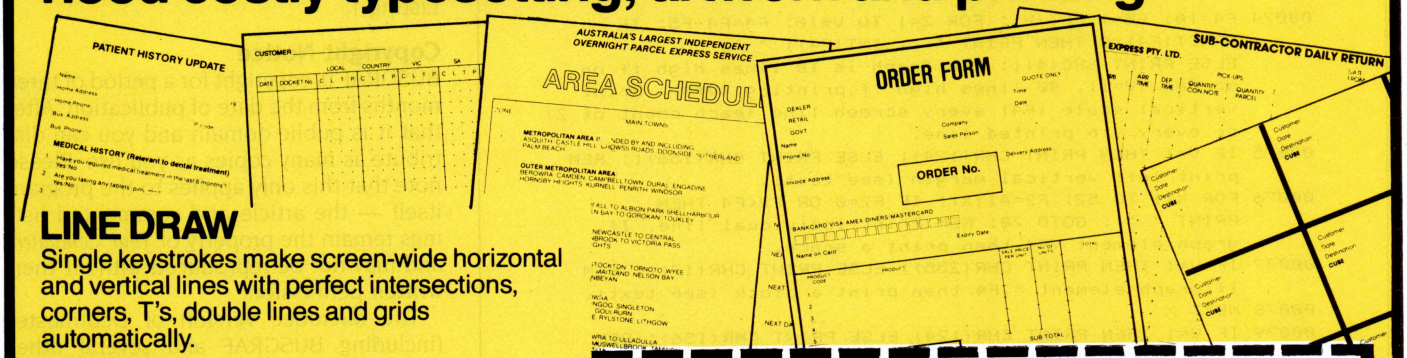

LINE DRAW

Single keystrokes make screen-wide horizontal and vertical lines with perfect intersections, corners, T's, double lines and grids automatically.

MERGE

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```
00066 NEXT X: IF F6=0 THEN GOSUB 103: PRINT SPC(17);
      "<<< NO DATA IN GRAPH FILE";: GOSUB 102: GOTO 7
00067 RESTORE 123: F4=0: IF F2<5 THEN GOSUB 103: PRINT SPC(21);
      "<< INVALID TOTAL";: GOSUB 102: GOTO 7
00068 READ F3: IF F2=>F3 THEN LET F4=F3: GOTO 68 ELSE LET
      F3=F4/10: K1$="$": IF F3>.1 THEN LET K0$=STR(F3):
      K0$=K0$(;2,LEN(K0$)-1): K1$="$"+K0$+"'s": REM Get the
      range in which the graph best fits (units of F3)
00069 FOR X=1 TO 52: F2=A1(X): IF F2>0 THEN LET F2=F2/F3: REM
      Reduce all individual totals to fractional form (0-9.999)
00070 A1(X)=F2: NEXT X: IF V=1 THEN GOSUB 108: CURS 1,3:
      GOTO 74: REM Clear screen and jump to 74 if displaying

Start Printer

00071 GOSUB 103: PRINT
      "Press <ESC> to Abort or <RETURN> when Printer ready *";
      CHR(8);
00072 GOSUB 95: IF X=27 THEN 7 ELSE IF X<>13 THEN 72 ELSE
      GOSUB 98: OUT#0: OUT#0 OFF : OUT#S ON: PRINT: REM Await
      key. Abort if <ESC> (=27), continue if <RETURN> (=13)
00073 PRINT CHR(27); CHR(65); CHR(6): REM Switch to 6/72" line
      height (see text).

Do graph

00074 F4=10: F5=1/FLT(V): FOR Z=1 TO V*10: F4=F4-F5: IF
      FRACT(F4)=0 THEN PRINT " "; INT(F4); " ";
      ELSE PRINT SPC(4);: REM Graph is 10 lines high if on
      screen (V=1), 40 lines high if printing (V=4). Print
      vertical scale (F4) every screen line (each count of Z)
      or every 4th printed line.
00075 IF V=1 THEN PRINT CHR(124); ELSE PRINT CHR(156);: REM
      print left vertical margin (see text).
00076 FOR X=1 TO 52: F2=A1(X): IF F2=0 OR F2<F4 THEN
      PRINT " ";: GOTO 78: REM Print individual line. If
      graph element <F4 then print a space.
00077 IF V=1 THEN PRINT CHR(255); ELSE PRINT CHR(17);: REM
      If graph element =>F4 then print a block (see text).
00078 NEXT X
00079 IF V=1 THEN PRINT CHR(124) ELSE PRINT CHR(156): REM
      print right vertical margin (see text).
00080 NEXT Z
00081 IF V=4 THEN PRINT\CHR(27); CHR(50);: REM Reset
      standard printer line spacing (see text)
00082 PRINT SPC(5);: FOR X=1 TO 5: K0$=STR(X*10): K0$=K0$(;2):
      PRINT [A8 45]; K0$;: NEXT X: PRINT "-- Week": REM Print
      horizontal scale
00083 PRINT K1$; SPC(25-LEN(K1$+K5$));
      "<< RECEIPTS FROM "; K5$; " >>";
00084 GOSUB 118: K2$="$"+K0$: PRINT SPC(17-LEN(K2$)); K2$: REM
      Print total.
00085 IF V=1 THEN GOSUB 103: GOSUB 94: GOSUB 108: CURS 1,4
      ELSE PRINT \\\: REM Wait for a key if on-screen

Do Monthly figures

00086 PRINT SPC(21); "<<< MONTHLY TOTALS >>>"\
00087 RESTORE 122: FOR Z=1 TO 12: F6=A1(Z+52): GOSUB 118:
      READ K1$: PRINT SPC(6); K1$; " ="; SPC(12-LEN(K0$)); "$";
      K0$;: IF FRACT(FLT(Z)/2)=0 THEN PRINT ELSE PRINT SPC(8);
00088 NEXT Z: PRINT\SPC(27-LEN(K2$)/2); "Total = "; K2$
00089 IF V=1 THEN GOSUB 103: GOSUB 94 ELSE PRINT \\\\\\:
      IN#0: OUT#0: REM Wait for a key if displaying, else
      turn off printer.
00090 GOTO 2

SUBROUTINES

Save BUSGRAF data file to disk
```

Line 2. This sets the number of significant digits allowed in real numbers to 10 digits rather than to the default value of 8.

Once you've entered BUSGRAF then make the necessary modifications to the DEBT and PRI sub-programs and enter the DUMMY program. DUMMY creates a fake PAID Ledger that you can use to create a graph file (starting date is 1/1/87) to test that the program is working.

Printer Modifications

BUSGRAF is designed to use a BMC or CP80 type dot matrix printer. If you're using a daisy wheel or an incompatible dot matrix, then you'll have to modify the printer commands. Printer incompatibility arises from differences between the 'control' characters or sequences recognised by different makes. Refer to your printer manual to determine whether changes need to be made to the lines shown in Listing 1.

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The Microbee version of Debtmaster (including BUSGRAF and several other useful utilities) can be purchased for $55 plus $11 tax plus $2 P&P from Dreamcards, 8 Highland Crt, Eltham North 3095 Vic. (Mail order only). Please state whether you want a 3 or a 5 inch disk. □

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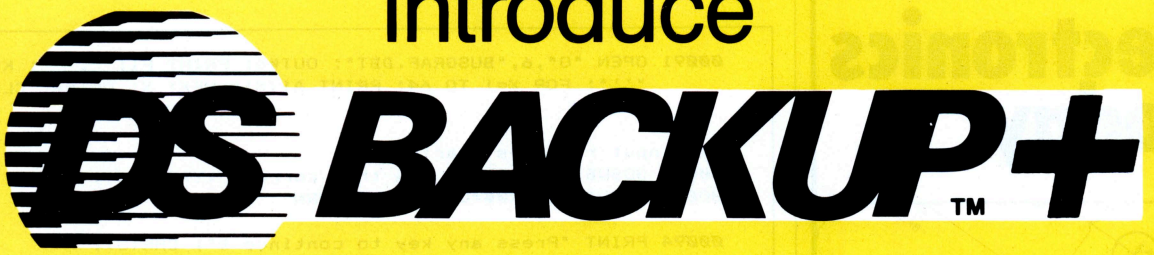
introduce



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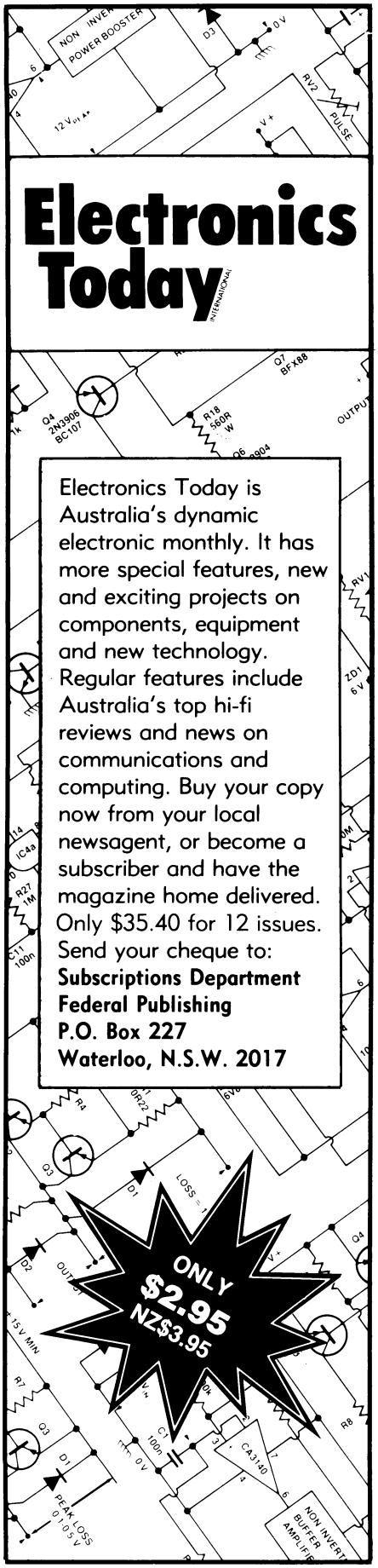

Debtmaster

```
00091 OPEN "O",6,"BUSGRAF.DBT": OUT#6: PRINT F1; ",'''"; K5$;
      "'''": FOR X=1 TO 64: PRINT A1(X): NEXT X: OUT#0: CLOSE 6:
      RETURN

Key input routines (various)
00092 GOSUB 103: PRINT "Is this correct (Y/N)? *"; CHR(8);
00093 GOSUB 95: K0$=CHR(X): RETURN

00094 PRINT "Press any key to continue *"; CHR(8);

Main Key input routine
00095 X=ASC(KEY$): REM Clear key buffer
00096 X=ASC(KEY$): IF X>96 AND X<123 THEN LET X=X-32: REM
      Get key. Capitalize if lower case
00097 IF X=124 OR X=128 THEN 96 ELSE RETURN: REM Loop if
      invalid

00098 GOSUB 103: CURS 30,16: PRINT "-Wait-";: CURS 0: RETURN

Convert F3 into a string in K0$. Allow two decimals
00099 K0$=STR(F3): K0$=K0$(;2): X=SEARCH(K0$,"."): IF X>0
      AND LEN(K0$)>X+2 THEN LET K0$=K0$(;1,X+2)
00100 IF X>LEN(K0$)-2 THEN LET K0$=K0$+"0": GOTO 100: REM
      Add any trailing zeroes required for 2 decimals
00101 RETURN

Display rest of error message, beep then erase it
00102 PRINT " >>>";: CURS 0: PLAY 22,1; 0,20
00103 CURS 1,16: PRINT [A63 32];: CURS 1,16: RETURN

W=two digit numeric key input
00104 K0$="": W=0: CURS 35,Z: PRINT " ";: GOSUB 95: IF X=13
      THEN RETURN ELSE IF X<48 OR X>57 THEN 104 ELSE LET
      K0$=CHR(X): W=X-48: GOSUB 106: REM First key
00105 GOSUB 95: IF X=13 THEN LET X=0: RETURN ELSE IF X<48 OR
      X>57 THEN 105 ELSE LET K0$=K0$+CHR(X): W=W*10+X-48:
      REM Second key
00106 CURS 36,Z: PRINT K0$;: RETURN
Print highlighted key selection on menu

Convert F6 into a string in K0$. Abbreviate if 1000000+
00118 K0$=STR(F6): K0$=K0$(;2): IF F6=>1000000 THEN LET
      K1$=K0$: K0$=K1$(;1,4)+"M+": RETURN

Convert number in string K0$ to two decimals
00119 X=LEN(K0$)-2: Y=SEARCH(K0$,"."): IF Y>X THEN LET
      K0$=K0$+"0": GOTO 119 ELSE IF Y<X THEN LET
      K0$=K0$(;1,Y+2)
00120 RETURN

00121 DATA 31,28,31,30,31,30,31,31,30,31,30,31
00122 DATA "Jan","Feb","Mar","Apr","May","Jun","Jul","Aug",
      "Sep","Oct","Nov","Dec"
00123 DATA 1,5,10,50,100,500,1000,5000,10000,50000,100000,
      500000,1000000



                    CHANGES TO "DEBT" PROGRAM
                         (See Part 1)

Insert new lines;

00049 ON ERROR GOTO 47: IF K0$="C" OR X=2 THEN LET U=U+1000:
      GOSUB 128: K0$="N": REM Save flag for BUSGRAF as well as
      for the Change account option
00050 IF X=2 THEN RUN "BUSGRAF" ELSE IF K0$="D" THEN GOSUB 117:
      GOTO 10: REM Slot in code to run BUSGRAF
                          ----------
```

Basic2 on the Amstrad

Since the development of Basic from Fortran in the early sixties, a number of attempts have been made to 'improve' it. Tim Hartnell found that Basic2, the language provided with Amstrad's IBM-compatible PC1512, is very much an improvement — better even than Microsoft Basic, BasicA or GWBasic.

BASIC2, the programming language provided with the Amstrad PC, is significantly different from the majority of Basics currently available. Line numbers are optional, the program can GOTO and GOSUB to labels (so GOSUB end_of_game is a valid command) and the repeat constructions WHILE/WEND and REPEAT/UNTIL are available. Despite these additions, Basic2 remains significantly compatible with the Microsoft Basics (with the exception of a few commands including DEFINT and COLOR).

To load a 'normal' Basic program into the Amstrad, you only have to save it as an ASCII file [SAVE "NAME",A] and it will read in without any problems. Basic2 saves its programs as ASCII files, which is slower than non-ASCII and takes more disk space, but these are generally of little importance.

More significant than these, however, is the fact that Basic2 runs under, and *only* under, GEM, the Digital Research 'Mac-like,' user-intuitive front end, so it works in a graphical, window-based environment, under mouse control. This is shown not only by program lines like CLOSE WINDOW #1 and BUTTON (to return the state of a given mouse button), but by the presence of such graphical reserved words as PIE (to create a 'pie slice'; specified by its starting point, radius, start angle and end angle), BOX, ELLIPSE and CIRCLE.

To simplify the readability of program listings, all variable names, and labels, are shown in lower-case (regardless of how they are entered) and all reserved words (GOTO, REM and so on) appear in upper case.

The Programming Interface

As you can see in Figure 1, the opening screen consists of three windows: Dialogue (in which the state of the system, with statements like Ready, is shown); Results-1 (where program output is shown); and the Edit window (headed in this illustration with the program name BOWLING.BAS). (The screen can be totally modified under program control, or just by use of the mouse and/or drop-down menus.)

However, as the Window's drop-down menu shows in Figure 2, there are two output windows (Results-1 and Results-2), and the Dialogue and Edit windows can be closed completely. You can see, as well, in this illustration that the Results-1 window has been extended to cover around 75 per cent of the screen.

The Basic2 screen is 100 per cent 'soft', which means that everything on the screen is treated as a graphics artifact, rather than a character block. As a result, you can move the Edit window by one pixel, and all the words in your program will move by this same tiny amount. The trade-off to this is that entering a program is a fraction slower than entering a program on a standard IBM PC (despite the fact that the Amstrad PC runs at almost double the IBM's clock speed — this is clearly evident when running programs originally written on the IBM).

When you signal to the Amstrad PC that you have finished entering a line by pressing Return, the operating system takes a noticeable amount of time to check the

Sugar's Baby

FOR MORE on Alan Sugar's innovative PC1512, see Ewart Stronach's review, *Sugar's Baby*, in YC, December 1986. □

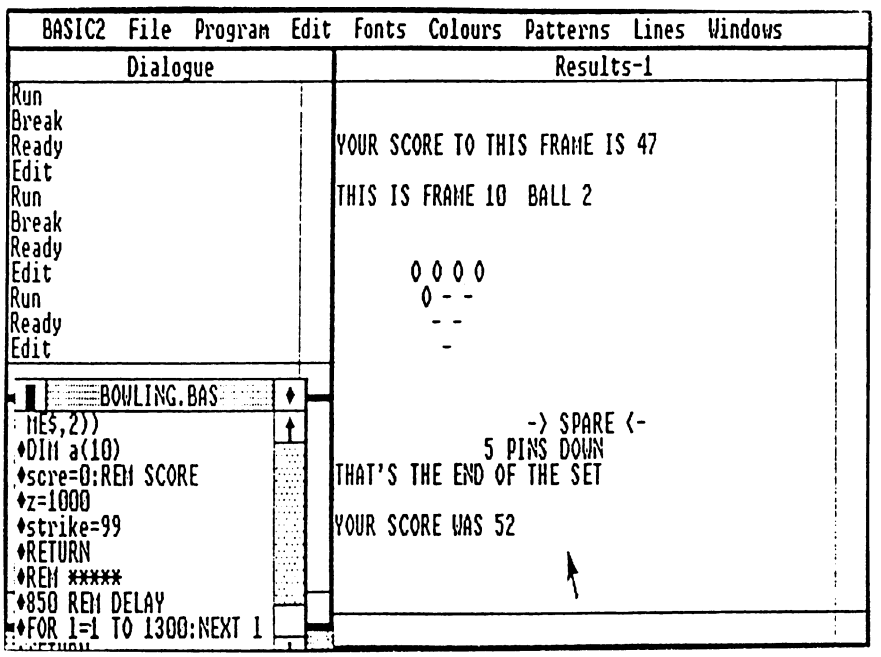

Figure 1. *Basic2's opening screen has three windows: Dialogue shows the state of the system; the window headed Results-1 shows program output; and the Edit window, headed* BOWLING.BAS.

line you've just entered, putting reserved words in upper case and variables and label names in lower case, and then moving to the next line to accept your next entry. Because of this, I found that time and time again the first two or three letters of the first word on a new line were missed (the keyboard buffer seems inoperative while the computer is checking a line) — instead of REM, a line would begin M, or PRINT would be rendered NT. This meant I had to back up, using the mouse or the cursor keys, and insert the missing letters.

All Basic2 program lines begin with a diamond, whether or not a line number is present. If a program line is longer than the width of the window, a dash (—) appears at the start of the continuation of the line, to show it is part of the preceding line.

Line Numbers

As I said earlier, line numbers are optional. The example program given in Figure 3 determines simple interest. It shows many aspects of Basic2 in action. (If you have an Amstrad PC, and you want to run this program, keep in mind that there are four variables involved in simple interest: principal, rate, time and interest. You enter the figures you have, entering a zero for the figure you do not know. The PC will use the correct version of the formula to produce the unknown value. Note that time must be entered in years — with decimal fractions allowed, such as 3.5 for three and a half years — and the rate must be a figure which represents the percentage, such as 7.25 for 7.25 per cent.)

The first line in the example, fairly obviously, is a REM statement naming the program. The next two lines set up the WINDOW requirement, closing all windows (CLOSE #2: CLOSE WINDOW 3: CLOSE WINDOW 4), then ensuring that window 1 fills the whole screen (WINDOW #1 FULL ON). The command SET POINTS 18 tells the computer to print out the output in 18 pt type (the default is 10 point).

You can see that, even without studying Basic2, the program listing is pretty clear. If you move down through the listing, you'll see these lines-

```
IF p=0 THEN GOSUB principal
IF r=0 THEN GOSUB rate
IF t=0 THEN GOSUB time__is
IF i=0 THEN GOSUB interest
```

The labels allow the programmer to make the listing far more meaningful than it would otherwise be. Simply looking at these four lines tells you exactly what they do, whereas GOSUB 1000 would require you to find line 1000 in the listing, and then — if the programmer had thought of it — read a REM statement to see what the subroutine was intended to do. GOTO also supports labels and, when used in an IF statement, demands use of the THEN. That is, you need to say —

```
IF x=1 THEN GOTO end__of__cycle
```

You cannot say —

```
IF x=1 THEN end__of__cycle
```

although

```
IF x=1 THEN 1000
```

is acceptable.

Line numbers can be used, if you like, for all or part of a program. Numbers act only as label names, anyway, in Basic2, so you can simply number the lines which you want to reference. The Renumber command will just renumber the lines which exist in a program, even if there are only two or three of them, and they are widely scattered throughout the program.

The Simple Interest listing shows a few other aspects of using Basic2. You can see that a 'blank line', headed just by a diamond, can be used to break up the subroutines to make the program easier to understand. The contents of FOR/NEXT loops can be indented manually to further increase the readability of the program. WHILE and WEND are used to strobe the keyboard, with INKEY$ waiting for a key press to start the program running again.

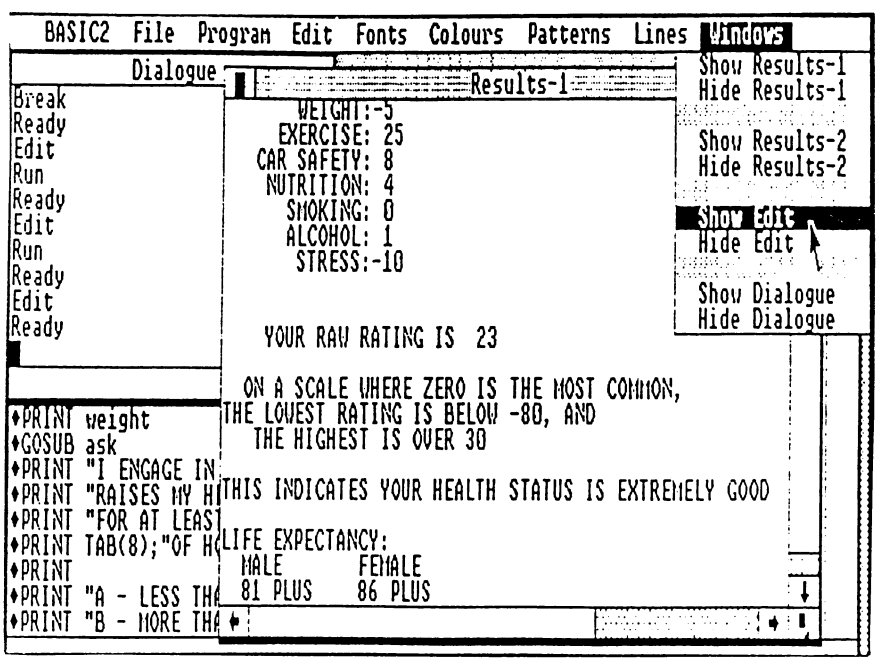

Figure 2. *Basic2's opening screen with the Windows drop-down menu — note that there are output windows, Results-1 and 2, in this case. The output window on the screen has been extended (compare with Figure 1).*

The Drop Down Menus

It takes a little time to get used to some of the demands of working in a windows-based environment (and some requirements, to be frank, I think I will never get used to; they need simply to be endured). To run a program, you have to pull down the Program menu, and click on Run. Alternatively, you can click on the Dialogue window, and then type in Run, or press F9. One oddity I noticed is that when you load a program, whether you want to or not, the program will nearly always automatically run (this happens 95 per cent of the time; I don't know what happens in the remaining 5 per cent).

You cannot LIST a program on the screen. To see part of a listing, you have to click on the Open Edit option (or click on any part of the Edit window if it is visible on the screen), then use the scroll bar down the right hand side of that window to locate the part of the program you want. The Home, Page Up, Page Down and End keys on the numeric keypad nearly al-

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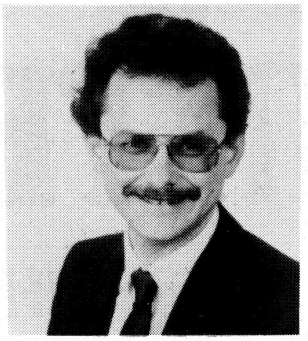

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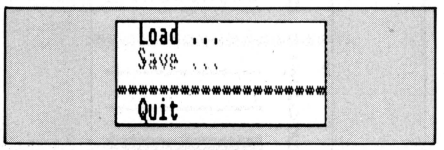
The Basic2 screen is 100 per cent 'soft', which means that everything on the screen is treated as a graphics artifact, rather than a character block.

ways (again, around 95 per cent of the time) can be used to move you more quickly through the listing than scrolling might do. If you click on the List option from the Program menu, the entire program will list to the printer.

The Basic2 menus give you a solid overview of the options available to you as a programmer. We'll look at them one by one.

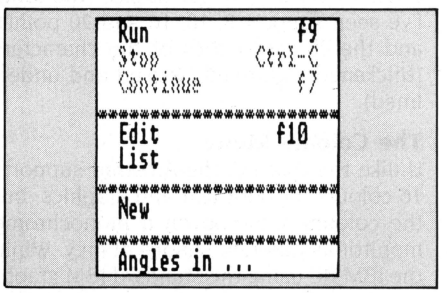
The File Menu

As you can see, his gives you Load, Save and Quit —



The Program Menu

This menu allows you to run a program (F9, will do the same thing), stop the execution of a program (or use Ctrl-C), continue from where you stopped (F7), edit it (F10), list the program to the printer, erase it with New, or — rather oddly, I thought, at this point — determine whether angles in a program are assumed to be in degrees or radians. Selecting this final option from the program menu brings a dialogue box onto the screen, with radians and degrees as options.

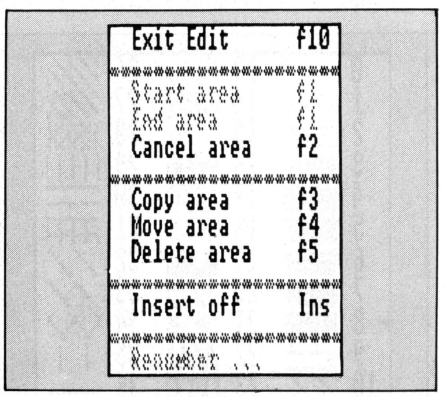



```
◊' Simple Interest
◊CLOSE #2:CLOSE WINDOW 3:CLOSE WINDOW 4
◊WINDOW #1 FULL ON:SET POINTS 18
◊CLS:PRINT:PRINT
◊INPUT "   Principal";p
◊INPUT "        Rate";r
◊r=r/100
◊INPUT "        Time";t
◊INPUT "    Interest";i
◊PRINT:PRINT
◊IF p=0 THEN GOSUB principal
◊IF r=0 THEN GOSUB rate
◊IF t=0 THEN GOSUB time_is
◊IF i=0 THEN GOSUB interest
◊PRINT:PRINT
◊PRINT "Press any key for a new run"
◊WHILE INKEY$="":WEND
◊RUN
◊
◊LABEL principal
◊PRINT "The principal is £";i(r*t)
◊RETURN
◊LABEL rate
◊PRINT "The rate is"100*i/(p*t);"%"
◊RETURN
◊
◊LABEL time_is
◊PRINT "The time is"i/(p*r)
◊RETURN
◊
◊LABEL interest
◊PRINT "The interest is £"p*r*t
◊RETURN
```

FIGURE 3. *A program in Basic2 — it calculates simple interest. A detailed discussion is given in the text.*

The Edit Menu

From this, fairly obviously, you get into the Edit window to edit the program (F10). You can mark part of a program to copy or move, or delete it, by clicking on the start of the section you are interested in (or use F1), and then move to the end section and click on End area (or F1, again). The selected section will reverse out (white writing on a black background), so you know that a section of program is marked ready to move, copy or delete.



Cancel area cancels the marking of a section of program (F2). Copy area (F3) inserts a copy of the marked section of the program. The original program section is not changed. Move area (F4) moves a marked section of program, deleting the original version, and Insert On/Off toggles whether what you enter on the keys is inserted into the listing, or simply writes over the material which already exists. The Ins ('insert') key will do the same thing.

Renumber allows you to renumber the line numbers in your program. The default start is 100, and the default increment is 10, but these can be modified in a dialogue box which appears after you click on Renumber.

The Fonts Menu

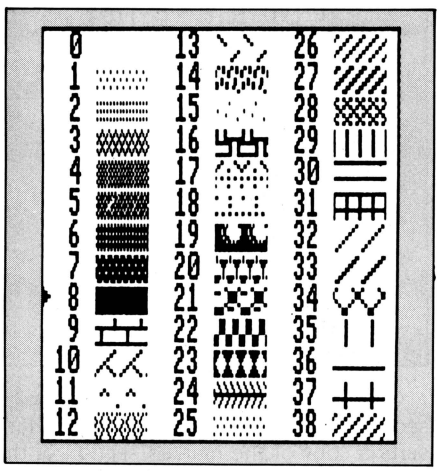
This menu is in three sections, for the font names (such as System, the standard font, Swiss or Dutch), the point size (the fonts I've seen support 8, 10, 16 and 20 point), and the characteristics of the characters (thickened, lightened, skewed and underlined).

The Colours Menu

Unlike the IBM PC, the Amstrad supports 16 colours for both text and graphics; but the colours show up on a monochrome monitor as different shades of grey. While the IBM PC using the standard IBM graphics card, gives you 16 colours in text mode, (but only two groups of four colours — and odd ones, they are: white, purple, sickly green and black) in graphics mode. Also, the monochrome monitor on the IBM PC only shows black, white and a single shade of grey. Here, as you can see, the Amstrad PC scores significantly over the IBM machine

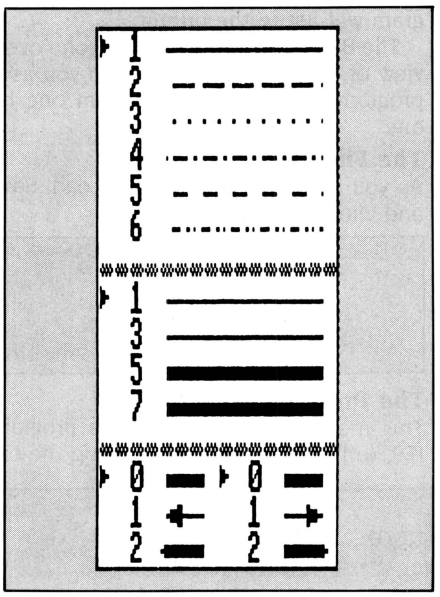
The Patterns Menu

The Amstrad PC supports 38 patterns (including 'None') which can be used for filling shapes on a graphics screen.



The Lines Menu

This, naturally enough, lists the various styles, thickness and end-styles available for drawing lines on graphics screens. You can select from six line styles, four widths and whether you want the lines to end in arrow heads, slightly pointed, or flat.



The Windows Menu

We've already mentioned this one (see Figure 2). It's used to open and close the windows on the monitor screen. If a window is already open on the screen, then Hide window-name will close the window.

Graphics Commands

Basic2 is furnished with a generous range of graphics commands, including seven Logo-like turtle commands. The non-turtle commands are as follows —

ARC draws an arc of a circle,
BOX draws a box,
CIRCLE draws a circle,
ELLIPSE draws an ellipse,
ELLIPTICAL ARC draws an arc of an ellipse,
ELLIPTICAL PIE draws a segment of an ellipse,
LINE draws a series of straight lines through a list of points,
PIE draws a pie slice,
PLOT plots a list of points, and
SHAPE draws a polygon with at least three vertices.

The command FILL, to fill a shape with a selected pattern, can be used with BOX, CIRCLE, ELLIPSE, PIE/ELLIPTICAL PIE and SHAPE.

There are also a number of screen handling commands, include GRAPHICS and SET to define your base graphics and text styles; FONT$ and POINTSIZE to return information about the character style currently in use, and TEST to return the colour of a specified point on the screen.

POS, VPOS, XPOS and YPOS return the position of the cursor, XMOUSE and YMOUSE return the location of the mouse, while XPLACE and YPLACE XSCROLL and YSCROLL tell you which part of the virtual screen is visible within a window. Other window commands include SCREEN and USER SPACE to define the size of a virtual screen, and to determine whether it is to be for text or graphics; while WINDOW SCROLL sets the section of the virtual screen which you can see in a window.

The turtle graphics commands are —

DISTANCE gives the distance of a specified point from the turtle,
FORWARD (can be abbreviated to FD) moves turtle forward, drawing a line as it goes (unless MOVE is specified, when no line is drawn),
HEADING gives the current angle heading of the turtle,
LEFT (LT) turns the turtle left through a given angle,
POINT moves the turtle around so it is pointing at a specified angle,
RIGHT (RT) turns the turtle right through a given angle, and
TOWARD gives the bearing of a specified point from the turtle.

String commands:

As well as the standard string-handling commands (RIGHT$, LEFT$, MID$ and the like), Basic2 includes LOWER$ and UPPER$ to change a string from upper case to lower, and vice versa. As well, there are LSET, which sets the beginning of a string to another of a different length, and RSET to set the end of a string to another of a different length. Another string-handling feature, with a great deal of potential, is that you can use the {start-character TO end-character} syntax to extract substrings from other strings.

All in all..

You can see that Basic2, as provided with the Amstrad PC1512, is a powerful programming language. A program listing, to some extent, can more closely resemble a C or Pascal program, especially if indentation is used to enhance the clarity of the program structure.

If you've felt that, perhaps, Basic had come to a bit of a dead end as an evolving language, and that you had to be a bit ashamed of admitting you still programmed in it (*Real programmers don't eat quiche and they don't use Basic*), spend a couple of hours with Basic2, and you're sure to change your mind. □

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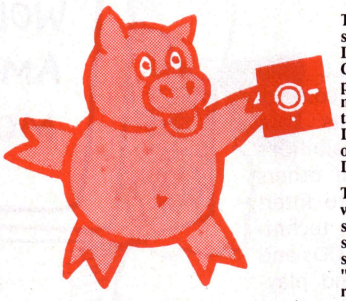

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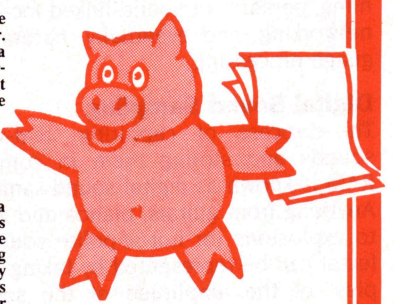

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Microcomputers, MIDI, and

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THE 'HUMANISED' SMALL computing system may soon come of age: Robotics specialists have been developing the possibilities of tactile input and output and others have been teaching computers to interpret what they 'see.' Meanwhile, technicians have been busy developing CDs and other digital sound recording and playback media which is leading to the next step — Voice-directed computer programming, perhaps, or sound-linked local area networking, and eventually, natural language processing.

Digital Sound Sampling

The process of capturing 'real-world' sounds and storing them in computer RAM is known as digital sound sampling. Anything from guitars, pianos and voices to explosions (or not-*so*-polite sound effects) can be represented by taking 'samples' of the amplitude of the sound's waveform, each sample only an instant apart. On command, the original sound of these mini digital recordings can be reproduced in the analogue domain from these samples. What's more, they can be scaled to musical pitches or transposed over octave ranges.

In addition to sound sampling, some musical instruments provide various waveform modification algorithms that may be employed to manipulate, cut, paste or otherwise displace sounds in relation to each other, mix different waveforms together, invert their time-base (to play backwards), or impart frequency modulation and other complex enveloping. These techniques facilitate the generation of a (theoretically) limitless range of sounds, dependent only on hardware limitations and the amount of data storage available.

The Apple Macintosh

The original Apple Macintosh comes with a built-in ROM-resident sound in three different ways. Its least demanding role is as a simple square-wave synthesiser that uses about 2 per cent of the processor's time. More serious musical applications require considerable more processing overhead.

Personal computing aficionados have witnessed some amazing developments in machine 'user-friendliness' over the past few years. But, as Andrew Symaniz extrapolates, if current trends are anything to go by, computers of the near future may feature a whole swag of downright 'user-adoring' qualities.

For example, the Mac's free-form synthesising function can be used to generate complex music, even speech, but requires about 20 per cent of the processor's time. The Mac's other sound function may be utilised as a four-tone synthesiser, but at a cost of around 50 per cent. Also, there are several programming tricks which can drive these functions (in combination) to exceed the four-voice limitation — in exchange for even more CPU-time.

The Macintosh integrates sound production with its video processing — which ensures a stable sampling period. But, that means the Mac's sampling rate is limited by the horizontal retrace interval (about 45 microseconds). As the video beam 'blanks back' to the start of each scan line, its MC68000 processor automatically fetches a byte from a fixed-length buffer and feeds it to an 8-bit D/A Converter. The analogue voltage signal the converter produces is then routed directly to the internal speaker and monophonic output jack.

Similarly, during the vertical retrace period (about every 20 milliseconds) the sound driver must shunt the required amount of sound data from memory into this buffer area ahead of the video beam.

Compared with most dedicated sampling machines available to the well-heeled musician these days, the Mac's sound system suffers from some hardware limitations. For instance, since graphics on the Macintosh are also processor-intensive, it's difficult to provide elaborate graphics and sound simultaneously.

In sampling theory, the fidelity of any digitally sampled sound is always dependent on two main variables — the sampling rate (for both recording and playback) and the sampling resolution: specifically, the more complex the sound wave, the more often samples need to be taken *and* the more precise the 'quantitisation' of the sample needs to be in order to faithfully represent the original analogue waveform (refer to Figure 1).

The Mac's sampling rate has an upper limit of about 22,300 samples per second and uses 8-bit sample resolution (which means samples are quantitised, or measured, in integer increments of 256).

Now, according to general sampling

Computers and Music

THE INTRODUCTORY article to Andrew Symaniz' series on microcomputers and music appeared in YC, April '87. His topic in the May issue was the programmable sound generator. If you'd like to catch up with the series, refer to the Services page on how to obtain back copies. And we'd like to hear about topics related to computers and music that you'd like to know more about — drop us a line. □

Music

theory (Nyquist's Theorem) a *minimum of two* samples per soundwave period is necessary in order to represent any given sound digitally — that is, the maximum sampling rate must always be at least twice the highest frequency that can be digitally represented. So, the highest possible frequency the Macintosh can physically reproduce via its internal hardware is 11.116 kHz. These specs would hardly be considered high-fidelity by 'pro-muso' standards, although the current Mac's overall sound potential is not too bad for a personal computer.

However, Apple's latest Macintosh design (the 68020 equipped Mac II) incorporates a proprietary four-voice sound chip called ASC (Apple Sound Chip). It's claimed to be fully compatible with existing Macintosh sound and music software, but with a maximum sampling rate in the vicinity of 44 kHz.

For comparison, the compact disk standard specifies a 44.1 kHz sampling rate with 16-bit resolution (that gives 65,536 discrete values) to faithfully represent the complex waveforms of music (which can embody a considerable number of low level 'harmonic overtones' that extend well beyond the average human range of hearing — 20 kHz).

The combination of the Mac II's turbo-charged sound chip with its FIFO (first in, first out) architecture, and its fast CPU, auxiliary coprocessors, 1 Kbyte sound data buffer, 1 Mbyte internal RAM (expandable to 2 Gigabytes via the NuBus expansion cards) could change the tune of the software developed for this venerable computer.

The Commodore Amiga

Commodore's Amiga series of computers feature four independently controllable sound hardware channels, each of which are assigned to either left or right audio jacks (for connection to external stereo equipment).

One programming method for controlling the Amiga sound channels allows quite comprehensive sound control and requires relatively small amounts of memory space. Using this method, the sound channel registers can be controlled directly via the 68000, whilst sound data is created 'on the fly.' However, this approach is really only appropriate for software that dedicates the machine almost exclusively as a sound production instrument.

In most cases, complex multi-channel sound can be produced and maintained

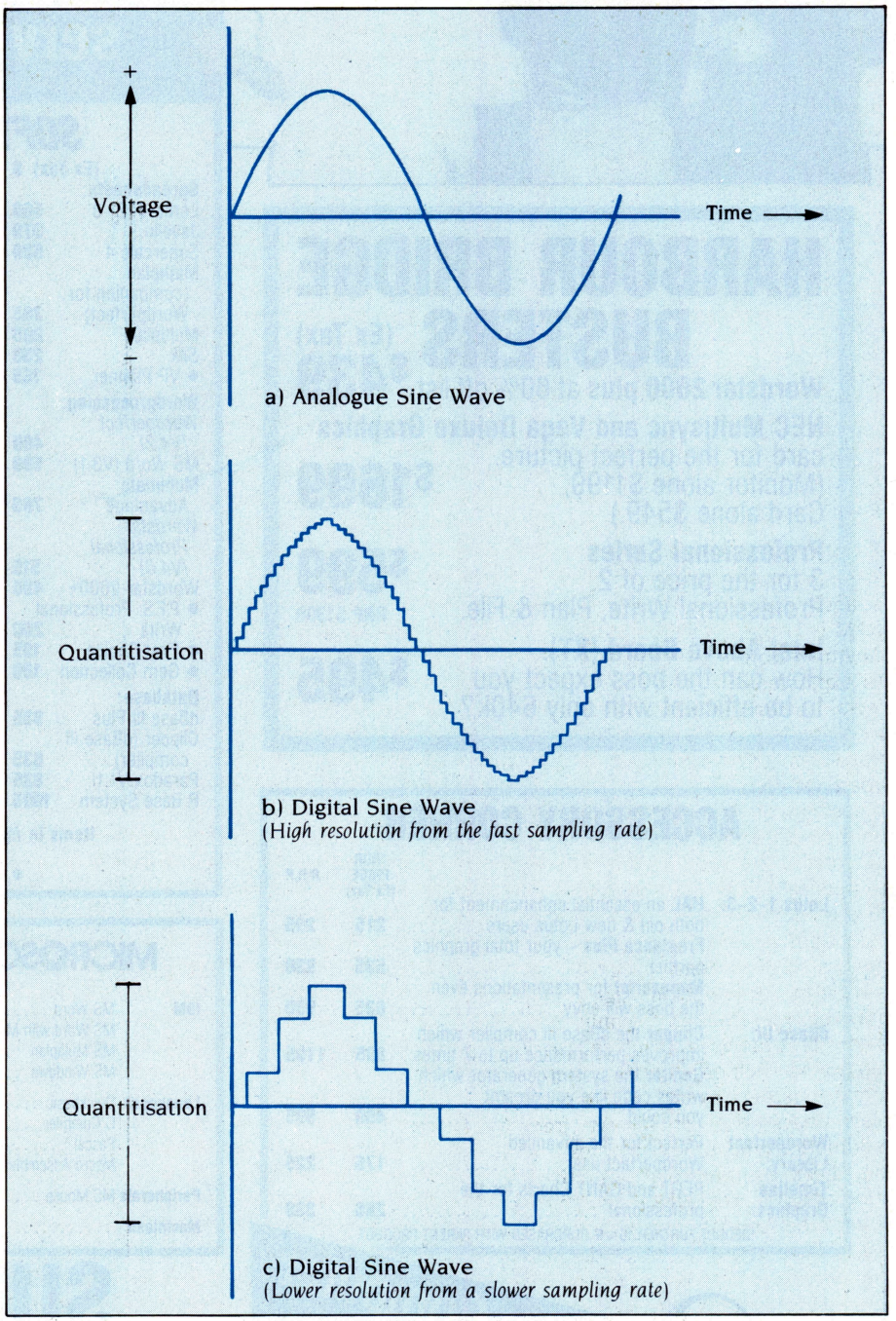

Figure 1. *In sampling theory, the fidelity of any digitally sampled sound is always dependent on the sampling rate (for both recording and playback) and the sampling resolution. The smooth sine curve in* a) *represents the original sound — think of it as infinitely sampled. The more often samples are taken, the more precise the 'quantitisation' of the sample becomes, and the closer the digitised sound represents the original analogue waveform, as can be seen in* b) *and* c).

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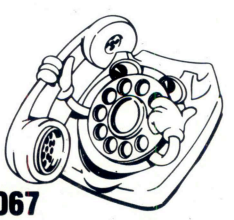

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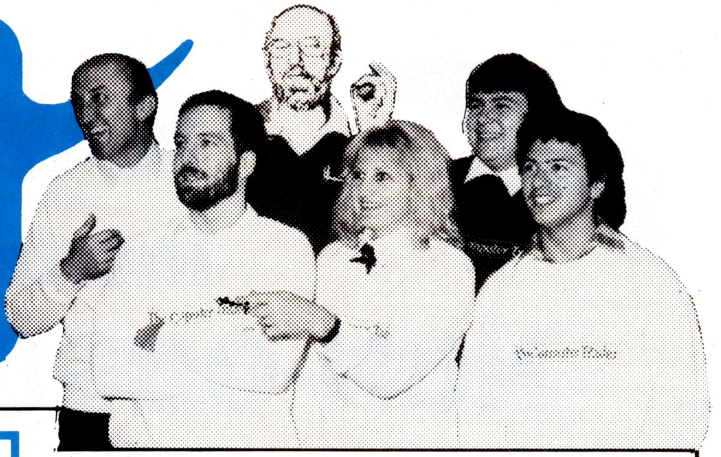

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autonomously by the built-in DMA (direct memory access) circuitry. This special hardware enhancement can automatically fetch sound data from wavetables that describe one or more cycles of the waveform of each voice.

This self-sufficient system of sound production on the Amiga enables the microprocessor to carry on with other tasks, while the DMA-driven hardware continues merrily producing four independent channels of sound without *any* further CPU intervention (unless, of course, a sound channel is explicitly disabled or otherwise reset by the microprocessor).

Briefly, each audio DMA channel contains several registers which describe –

1) the channel loudness,

2) the initial location of sound data in a wavetable and the length of the wavetable byte-sequence, and

3) the timing interval (or sampling period) — this specifies the number of system ticks between each data-byte sent out via DMA.

Of even more interest to the sampling musician, is the provision for the DMA sound hardware to effectively concatenate strings of sampled waveform data (since the audio DMA channel registers can be 'instantly' updated during system interrupts). In this way, portions of different waveforms can be seamlessly joined together, or a variety of other waveform editing tricks performed.

Furthermore, the Amiga's sound hardware is capable of reading the data output from one channel and 'plugging' this back into another channel to modulate its sampling period or volume in order to perform sophisticated frequency modulation and/or amplitude modulation effects.

But the Amiga's impressive hardware capabilities are extended further still through a library of ROM-resident audio-controlling routines. These provide for extensive manipulation of the sound channels and other parameters at a very high conceptual level.

For example, envelope-generating routines can automate the task of varying the amplitudes of played notes by reading data from envelope-tables, which are programmed to describe the ADSR (attack, decay, sustain, release) sound profiles for each voice.

Also, with the addition of some (inexpensive) optional A/D accessories, the Amiga can sample external sounds with a maximum sampling rate of 28.867 kHz.

Compared with dedicated sound samplers towards the lower end of the professional spectrum, the specs of the Macintosh and Amiga compare quite favourably.

During sound playback, each of the four voices are processed through individual companding (noise-reducing) 8-bit D/A converters, then filtered through (low pass) anti-alaising filters — these effectively attenuate sampling distortion above 5.5 kHz and virtually eliminate all remaining frequencies above 7.5 kHz.

The Amiga's sound generators are completely polyphonic and poly-timbral, which means each channel can play different sounds, chords or even chords of different sounds by pre-mixing digitised waveforms in the digital domain. So, with appropriate software and a decent library of sounds, the musician could 'multi-track' together complex multi-voice compositions (within RAM limitations, of course) without requiring any extra accessories.

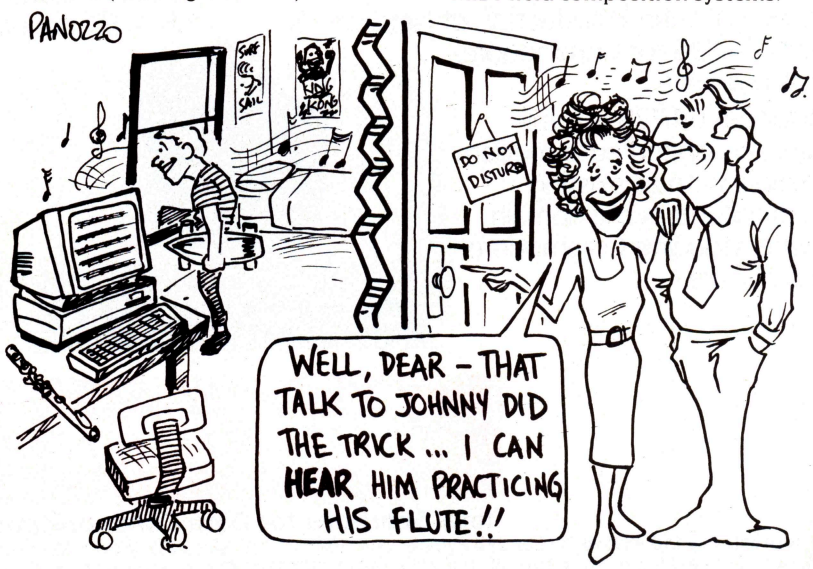
What's more, the multitasking Amiga can allocate 'virtual' audio channels on a priority basis (plus store sound requests for a particular channel in a queue until they can be processed). So, with some crafty programming, the four Amiga voices can be made to function in such a way as to give the impression that there are really more voices (sound generators) on-board.

So there you have it . . . Compared with dedicated sound samplers towards the lower end of the professional spectrum, the specs of the Macintosh and Amiga compare quite favourably. (The Ensoniq Mirage Keyboard synthesiser, costing around $3000, is also an 8-bit machine with sampling rate of 33 kHz). Although the Mac might have a much wider variety of software support right now, the Amiga costs a lot less, features companded playback (for superior signal-to-noise figures), and for sheer horsepower, this impressive machine remains untouched.

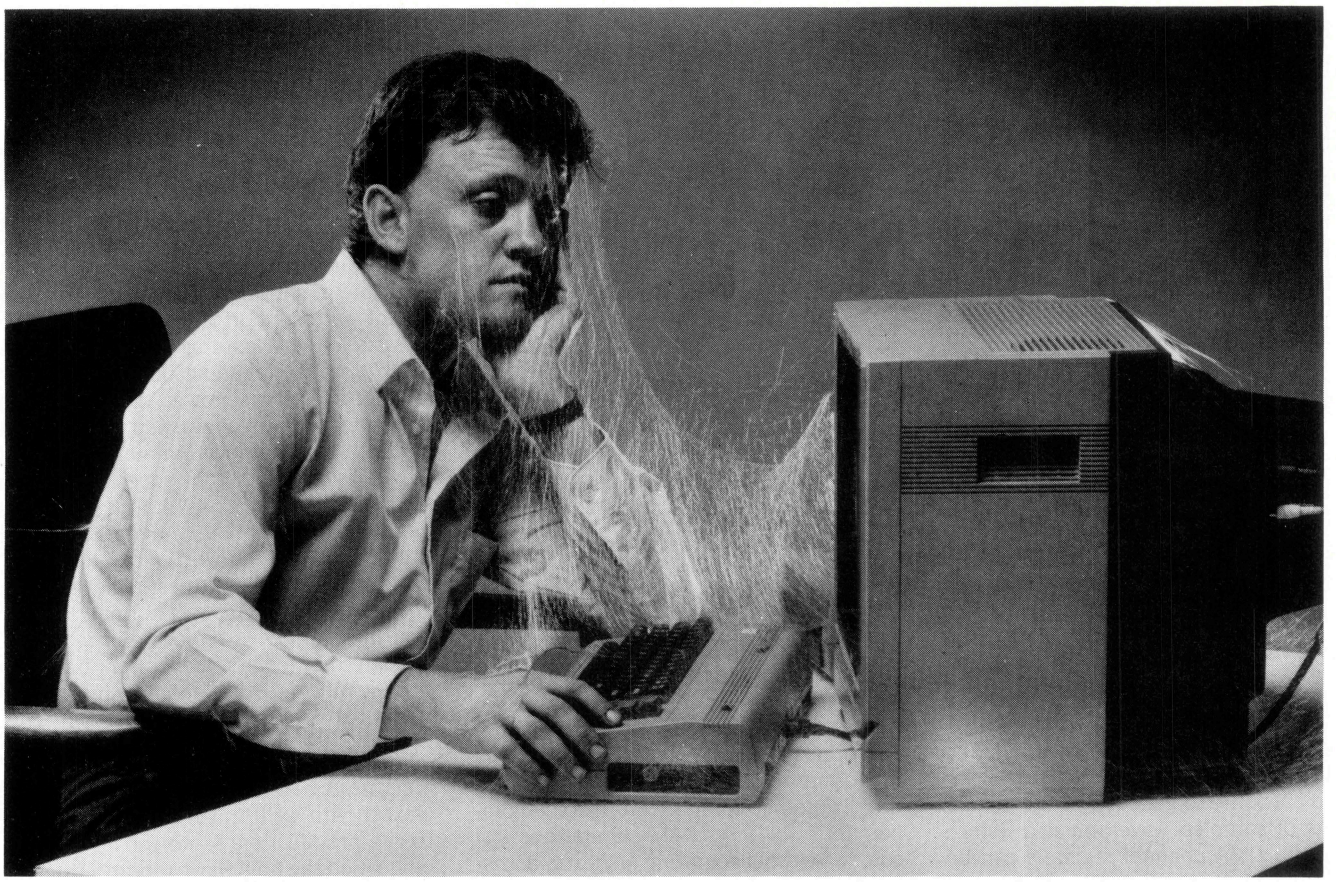
One sound innovation unique to the Amiga is its support of speech synthesis as a standard feature. Without any additional hardware, the Amiga's internal narrator device can work with a library of text-to-phoneme routines. This enables the computer to speak normal English text in a variety of pitches and rates. Although the results may often be fairly heavily inflected, the Amiga's 'chip-chat' *is* understandable — even with your eyes closed.

And next . . .

Next month we'll travel backward in time to the pre-MIDI era — to those 'bad' old days when the only way to control external multi-voiced music composition devices from the computer involved attaching cumbersome 'bolt-on' hardware and installing additional performance software (sometimes even made by different music manufacturers) In subsequent articles, we'll discover the importance of all this not-so-ancient groundwork in relation to the current generation of sophisticated MIDI-field composition systems. □



NetComm believes Commodore owners have waited long enough.



It seems Commodore owners are a patient lot.

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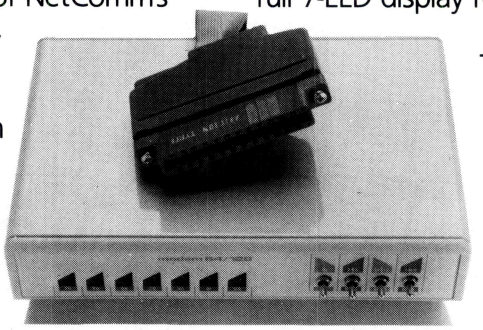

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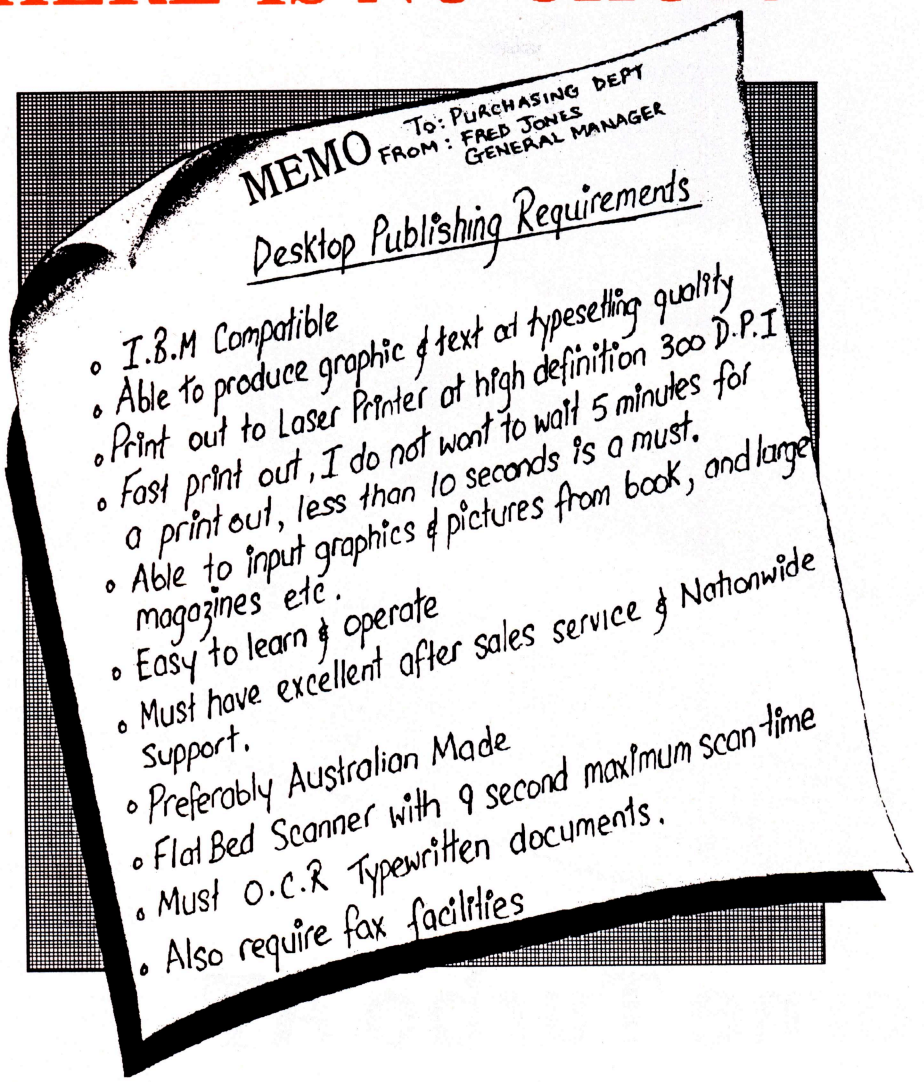

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The Osborne Turbo AT is driven by an 80286 processor which is switchable between 6 and 8 MHz. It uses 1.2 Mbyte, 5¼ inch floppies and automatically recognizes the type of floppy that's been inserted.

Osborne Turbo AT

Looks like an AT, feels like an AT, but . . .

Osborne is one of the oldest names in 'personal computers' (remember 'The Fountainhead' in Interface Age?) — but they were strictly CP/M (what?) machines. Lately, they have ventured into the fast-moving world of MS-DOS and given Ewart Stronach, a pretty old name himself, an attack of the YACS.

IF I USE THE acronym YACS, I know a lot of you out there will think that it stands for Youth and Community Services. But we who are asked to review computers know differently: It actually stands for Yet Another Clone Syndrome and is identified by a general palsy, trembling of the hands, and hot and cold flushes. So here I sit, trembling with indifference, faced with a machine which looks, sounds, feels and describes just like the machine I reviewed in December. And January. And March.

Osborne has been around since Adam (sorry . . . in joke) and has survived some pretty torrid times. This new machine is a departure for Osborne — one of the few computer companies which have made the transition, however painful, from CP/M to MS-DOS. They have jumped in the deep end this time, and done it with little of the innovation that is apparent in their range of portable CP/M machines — they survived the shakeout of that market because they were more functional than their competitors. Good luck to them, but can they survive in the Big Bad World of Clones? Do they offer more bytes per buck? It needs something more than a well established name to survive in Australia's price and quality conscious market. Lets have a critical look —

It looks just like an AT. It feels just like an AT. It acts just like an AT . . . but *faster*.

That old standby, Norton's SYSINFO, suggests an operating performance relative to an IBM PC's, of 9.2 with the Turbo switched on, and 6.6 with it off. This equates with such established clones as the 286 Compaqs and DSE's Multitech

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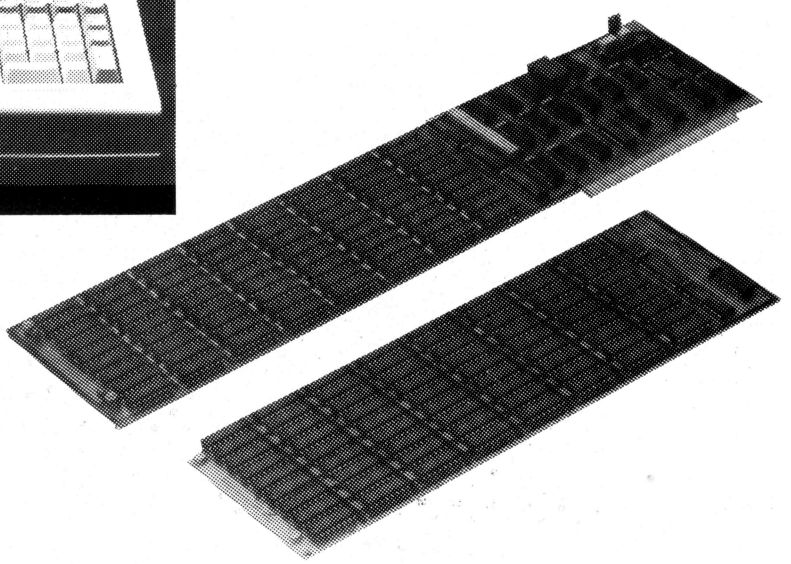

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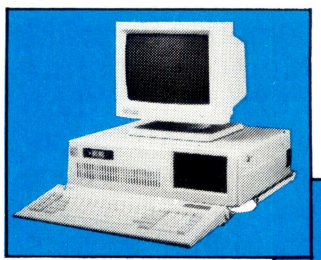

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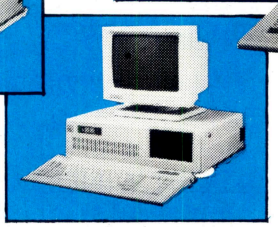

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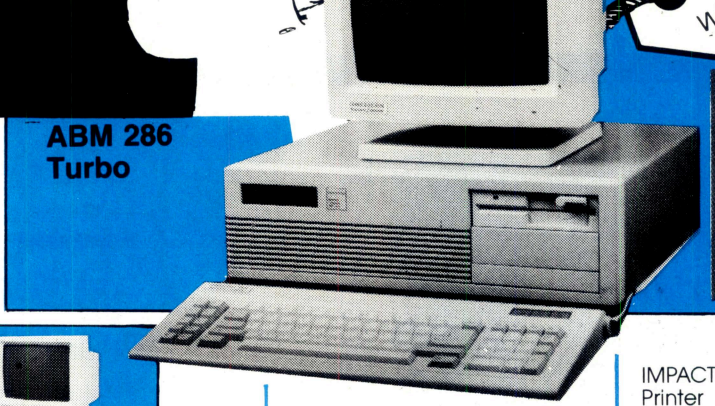

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Osborne Turbo AT

This would have placed the machine in the top four of those tested in YC's 'The World's Fastest Personal Computers!' (Sept'86) — There the Osborne turned in a lowly 12.5, but on an inexplicably slow machine.

900. Not wishing to encroach on the territory of that well known speed freak, Matt Whelan, I haven't run the full gamut of bench tests — I satisfied myself that this is a fast machine with Norton and the BBBMARK test, which times a simple loop in Basic. It's just a three liner —

```
10 FOR I = I TO 100
20 A = A
30 NEXT I
```

This gives a fair indication of processing speed (as distinct from number crunching capability) and the test took 5.7 seconds. This would have placed the machine in the top four of those tested in YC's *The World's Fastest Personal Computers*! (Sept'86) — There the Osborne turned in a lowly 12.5, but on an inexplicably slow machine.

The test machine was fitted with an MSCRIBE 44 Megabyte hard drive. I hadn't used this type of drive before and the *speed* at which it works must make a substantial difference to the overall performance of the unit. But, processing speed is not the be all and end all of every-day computing — in a 'normal' office environment, with normal applications such as spreadsheets and wordprocessing, the limiting factors are first, the operator's speed and second, the amount of time spent waiting for the computer to file or retrieve data. No one can do much about a slow operator, but the right choice of hard disk can make a world of difference — as this one shows.

Under the cover, we find the computer's *not* an Osborne (no great surprise). The only visible mark on the motherboard is a stylised F trade mark (which I don't recognise) and the inscrutable words 'Made in Taiwan.' This is no cause for alarm as the boards are beautifully made — solid and well-fitted. There is a whopping great 220 watt power supply already cabled for additional disks, plus three half slots and five full length slots. The hard disk is full height and the remaining blanks on the front panel could hold either another half height floppy and a half height hard drive, or any combination required. The floppy is 1.2 Mbyte and features auto recognition of disks. The machine boots quite happily on PC or XT 360 Mbyte disks so transition from lessor machines would pose no problem. There are no other surprises in there — just the mandatory gaps for additional memory, a spot for a maths co-processor and plenty of room to move about.

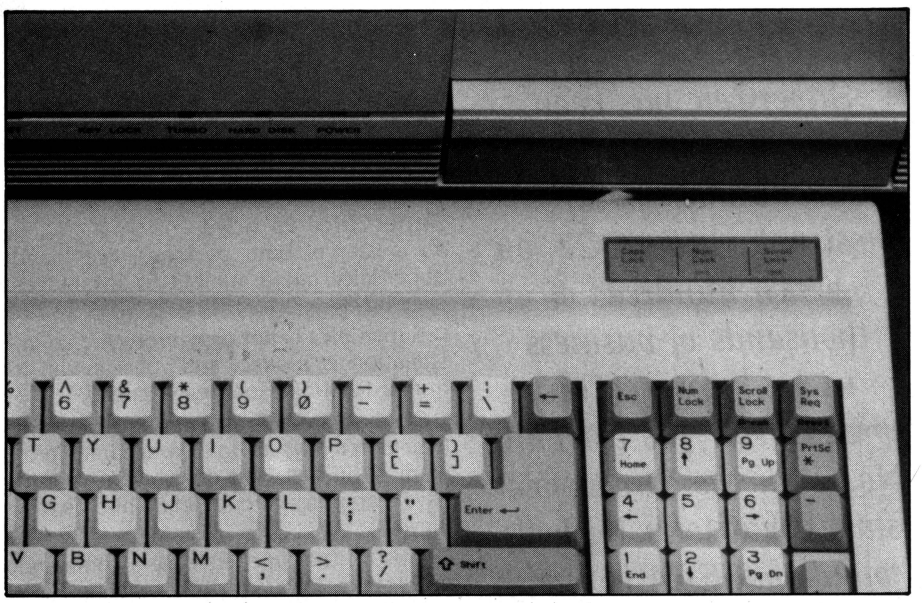


Figure 1. *Notice the status lights just above the* AT*-style keyboard — they show Key Lock, Turbo, Hard Disk, and Power. To the left of the lights is the Reset button.*

The test machine came with a CGA board, a serial/parallel board and a Thompson Hi-Res colour screen. Software included MS-DOS V3.20 complete with GWBASIC, a full set of utility programs and a disk of diagnostics. There was also a copy of a menu-driven hard disk organiser called Custom Menu System.

This was already installed on the hard disk when the machine arrived, so I gave it a try — it's too cumbersome to use and not a patch on Norton Commander, for my applications. However, it would be useful in an office where the same programs are used over and over, and the batch files to drive them could be easily hidden in a menu system.

The documentation is standard — a well-made three ring binder containing a nicely illustrated set of instructions for set up and any likely modifications. The binder is accompanied by a volume on GWBASIC — all packed in a sturdy slip cover.

All in all, the Osborne Turbo AT is a functional, *fast* and workman-like piece of gear. Its success in the market place will be measured by the loyalty that is (or isn't) instilled into current followers of the marque — who must, in due course, find CP/M middle-aged and arthritic. □

Product Details

Product:	Osborne Turbo AT
Distributor:	Osborne Australia 93 York ST, Sydney 2000 NSW
Price:	$6970 untaxed (with hard disk)

SuperCalc4

- A Program to Reckon With

SuperCalc has been around in its various versions since 1980 — most notably as SC2, on which hundreds of thousands of business users discovered the 'spreadsheet.' It's currently No. 2. in the spreadsheet stakes, but John Nicholls found that SC4 is ready to take on the perennial leader, Lotus' 1-2-3.

SUPERCALC HAS ALWAYS been a good product, and its fourth version is the most polished and impressive yet. I recently read an advertisement by Computer Associates which said 'SuperCalc4 is #2 and coming up fast.' That's a rare occurrences of understatement in advertising, in my opinion. In fact, in many ways I found it superior to #1, 1-2-3.

Now, down to business — The SuperCalc4 program and utility files come on three diskettes, and are accompanied by a comprehensive manual, two quick reference cards — one for commands, functions and macros, the other for graphics — a booklet entitled 10 *Minute Guide* (which is remarkably wide in scope for an introduction, and includes graphics and macros), two keyboard templates, *Notes for Lotus 1-2-3 Users*, *Notes for SuperCalc3 Users*, and the usual support information. (Well-documented is the way I've heard it described.)

SuperCalc4 vs 1-2-3

As a user of both packages, I've found SuperCalc4 has a number of advantages over 1-2-3 —

- SuperCalc4 is not copy-protected so installation is a snap, and you can run it from a RAM-disk for greater speed;
- SC4 has graphics as part of the program (you don't have to load a separate program — in fact, you don't even have to have a graphics card for a graph to be displayed);
- Most of the time, entering a command in SC4 takes fewer keystrokes than in 1-2-3 (usually one less);

Plus, I found, SC4 has a greater number of functions than 1-2-3 —

- Files from 1-2-3 can be loaded directly into SuperCalc4, while the reverse isn't quite so easy (the conversion is automatic from either 1-2-3 Release 1A or 2, and you don't need a separate translate program);
- As a command is selected, its name appears on the screen, so you always know where you are in the menu structure;
- SC4 includes Sideways, a program which allows you to print a wide spreadsheet sideways on dot matrix printers, notably those from Epson and IBM;
- SC4 treats all memory, low and expanded, as one chunk, which makes it easy to see how much memory you have left (In 1-2-3 low and expanded memory are used for different purposes and you can run out in one even though there is plenty left in the other);
- In SC4 you can optimize the way the program works for small, medium and large worksheets. Small is 254 rows by 63 columns; medium is 2000 by 127; and large is 9999 by 255; and
- With SC4, graphs can be printed or plotted horizontally or vertically on a full page, half page or quarter page — the half page can be either the top or bottom, the quarter page can be in any quadrant.

It's difficult to compare the speed of the two programs because the results are inconclusive; some functions are quicker in one program, while in other functions, the positions may be reversed.

Labels	*Statements*	*Comments*
CHANGE	(HOME) (DOWN)	Go to top of list
	(?)	Wait for input
	(Right 4)	Go to NAME field
	(?)	Put in correction
	(BRANCH GO)	Start over
CLEAR	(WINDOWSOFF)	Freeze screen
	/BOUTPUT	Clear output range
	/BINPUT	Clear input range
	(WINDOWSON)	Turn windows back on
	(BRANCHGO)	Start over

Figure 1. *A macro in SuperCalc4 comprises three parts — the Label is the name the macro is called by; the Statement is the macro definition; and the Comments explain what the macro is supposed to do. Two different macros are shown in the example above.*

SuperCalc4 Enhancements

SuperCalc4 has full word menus which appear when you enter the slash command. The first menu is comprehensive, listing twenty-one, single keystroke commands, including one for 'More.' When using the program, this undoubtedly saves on keystrokes, but the designers had to strain a bit to come up with meaningful choices, all of which must start with a different letter of the alphabet. Some of the commands from previous versions no longer appear on the menus under their old name, but they are there.

Very useful features of SuperCalc4 include the facility to name ranges and a 'learn' feature which makes it easier to write macros. Esc clears data from the entry line and a second Esc restores it — just in case you change your mind or didn't mean it. An auto-advance feature, which can be toggled on and off, remembers the last direction in which the cursor was moved so that after you enter the figures and press Enter, the cursor moves in that same direction. Although you are limited to two windows, you can put the same spreadsheet in each, but with one displaying the data and the other, the formulas.

Summing up

This latest revision of SuperCalc is a program that has been brought up to the point where it is broadly comparable with Lotus 1-2-3 Release 2.01 (Release 2 of Lotus 1-2-3 is too flawed to be given serious consideration). There is little to choose between the two programs, although in general SuperCalc4 offers more features. Certainly I'd be quite happy with either. However there is also Lotus HAL, the 'natural language,' to consider — it adds features to 1-2-3 that no other spreadsheet on the market can match.

It's a pity that a product like SuperCalc4 has to stand in the shadow of 1-2-3, but substantial price cuts are probably going to be necessary before SC4 reaches #1. □

Product Details

Product:	SuperCalc4
From:	Computer Associates International San Jose, California
Distributor:	Arcom Pacific 252 Abbotsford Rd, Mayne 4006 Qld (07) 52 9522
Price:	$825 untaxed

Spreadsheet Shopping?

BEFORE YOU GO shopping for a spreadsheet, make notes of your own specific requirements. Demonstration programs are all very well, but they can only give an overall impression. You've got to use the program — so try it to make sure it does what you want, and does it as easily as possible. The following is a checklist of features and functions to look for —

□ **Setting up the Spreadsheet:** Open a spreadsheet, title it and enter data. Try using formulas; can they be applied by moving the cursor to a cell as well as by entering the cell's address. (Draw up a sample spreadsheet with your own specific type of data in it before you go shopping. Take it with you — it'll save a lot of time and give a basis for comparison after you've looked at several programs.)

□ **Moving the Cursor:** Move the cursor from the top left corner of the screen, to the bottom right, and back again, to see how quickly you can move around the spreadsheet. Look for a Home command to return the cursor to the top left corner from anyplace on the spreadsheet (or to another cell you can specify).

□ **Cell Editing:** Move the cursor to a cell that holds a formula, and change it. Try changing your mind half way through the change. Entering and editing data will most likely be the most used functions, so they should be the easiest.

□ **Online Help:** You need help when you need Help, so getting it should be easy. Try getting help for example, on entering data, recalculating, writing a formula and titling the rows and columns of the spreadsheet. When you ask for help, do you get a context-sensitive answer, or do you have to scroll through a general help file?

□ **Formatting Cells:** Trying changing the width of a single column and a group of columns. How wide can they be? Can the contents of the cell be shown centred, justified right and left? What formatting choices are there for numeric data — if you enter a number, can it be automatically formatted to dollars and cents, or a designated number of decimal places, or scientific notation?.

□ **Printing:** Try printing the sample spreadsheet. Can you print it in landscape mode (sideways — this is almost essential if the spreadsheet is over 80 columns wide). What is the default format for printing negative numbers? Can you change it? Is condensed type available — this makes it possible to get up to 96 spreadsheet columns on 80 column paper. When printing in portrait mode, is it possible to define where the breaks in the spreadsheet will occur? Is it possible to force page breaks? Is it possible to print only a nominated portion of the spreadsheet?

□ **Windows:** If the program has windows, open as many as you can. Can you move from window to window, editing as you go, or can you only work in one window and just view the data in the others? Try copying part of a spreadsheet from one window to another.

□ **Graphics:** If the program has graphics, try creating several types of graphs from your sample spreadsheet and printing them out (or setting them up for print out). Can the axes of the graph be rotated, stretched and compressed? How easy is it to change the labels on the graph and add text?

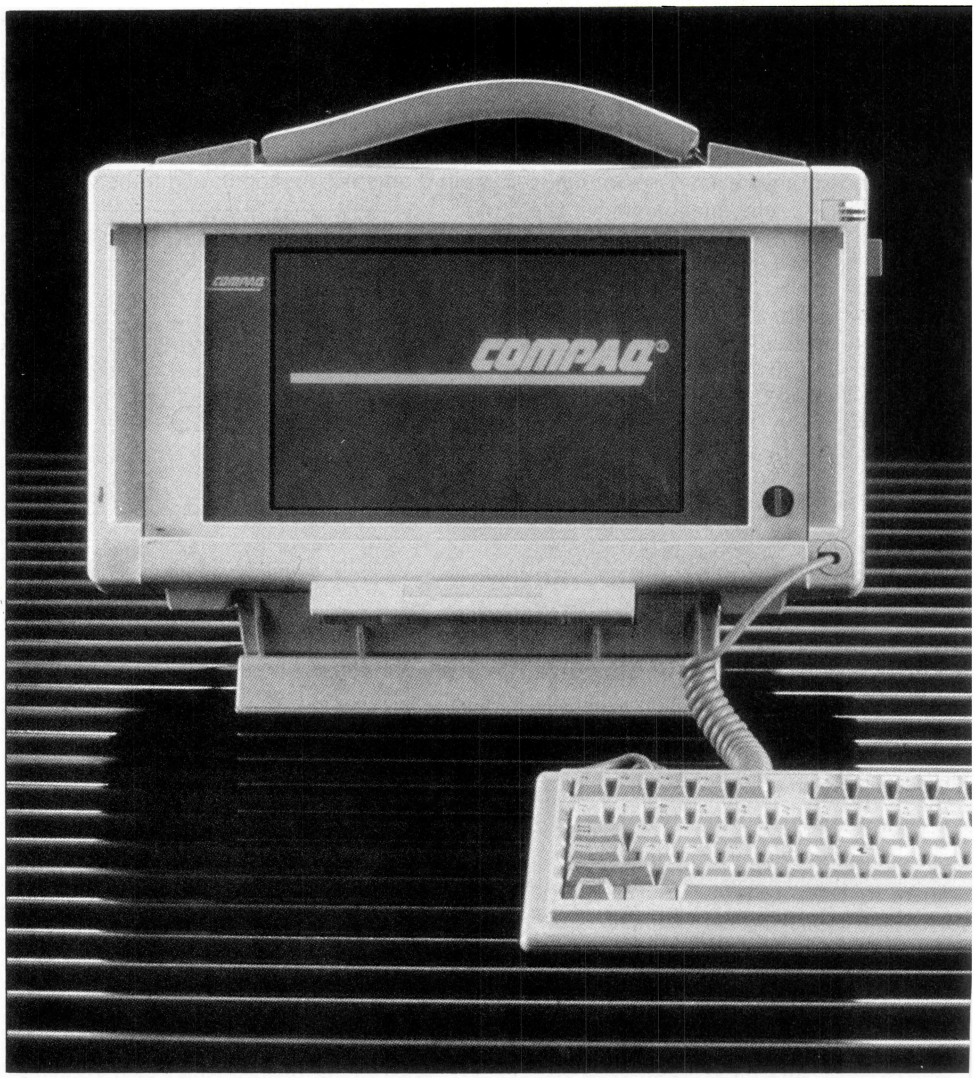
□ **Recalculations:** How easy is it change a formula and then recalculate the spreadsheet? Are the graphs created from the data automatically 'recalculated,' too? A large file with complex, related formulas is needed to properly check recalculation speed — ask the dealer if he has a sample file. Note the size and complexity of the recalculation, as well as the time, so it can be compared with other programs.

□ **Features:** Try a range of the other features the program offers — are there any especially useful ones? How easy is it to insert, delete and copy individual cells, rows and columns within the spreadsheet *and* between different spreadsheets? Can you manipulate a specified range of cells covering a number of rows and columns? Can a number of cells (not necessarily in the same row or column) be averaged, or otherwise manipulated easily? Is the documentation useful for applying any 'advanced' features the program may have, or does it just explain the basic commands? How easy is it to transfer data between the to and from other programs such as dBase and Lotus 1-2-3?

Compaq Portable III

— Smaller! Better! Faster! Bigger! . . . bigger??

The Compaq Portable III effectively kills the old giant desktop and initiates the appliance computer. As John Hepworth found, this is a device as powerful as any desktop except an 80386, but much the same size as a couple of pop-up toasters, side by side.



BIGGER THAN A LAPTOP, better than an ordinary clone, faster than an AT, smaller than a desktop. The Compaq Portable III has arrived. This machine effectively kills the old giant desktop and initiates the appliance computer — a device as powerful as any desktop except an 80386, but much the same size as a couple of pop-up toasters side by side. No longer does a high performance personal computer need to cover a desk. At the same time the Portable III is both bigger and smaller than the traditional desktop. Bigger in specifications, better in convenience, faster in performance and smaller in size and weight.

Not A Laptop

The Portable III is a new generation one-box computer, using an 80286 processor, a 12 MHz clock and having up to 6 Mbytes of 100 nanosecond RAM. Other features include an internal 20 Mbyte hard disc (40 Mbyte is optional), a 1.2 Mbyte 5¼ inch floppy and a plasma screen with 640 by 400 resolution.

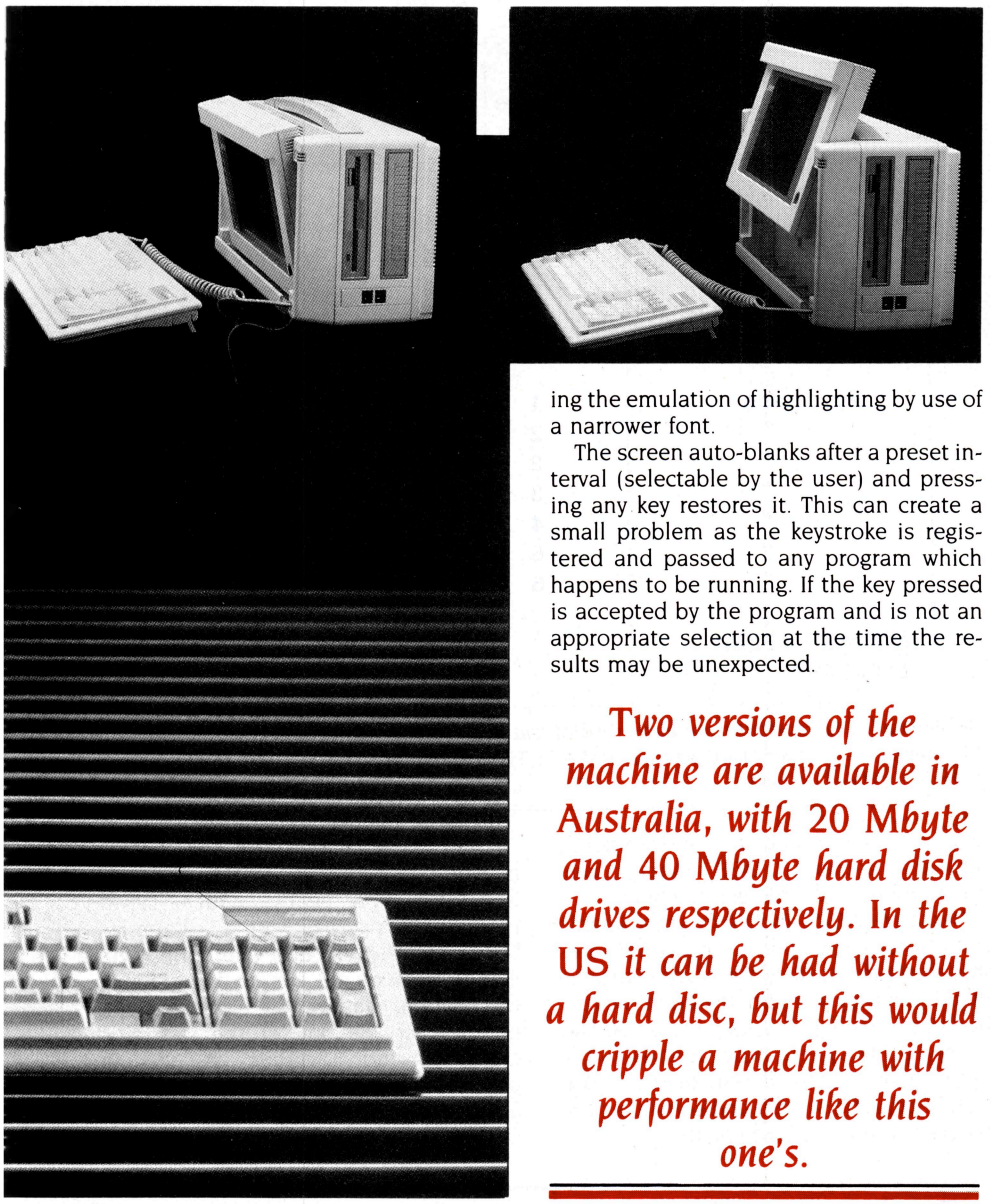
The Portable III is a pale greyish plastic box 40 long, 25 high and 20 deep, with a well-padded handle on the top. At 9.1Kg, the Portable III is solid, but it is still easy enough to carry one-handed. An optional nylon fabric or leather shoulder bag is available to protect the unit while it is transported.

Clipped onto the front, with the keys on the inside, is the keyboard. Around the rear is a parallel port, 9-pin serial port, RGB connector, power inlet socket and switch and a little sliding door for the bus expansion. The rear panel is quickly removed for access to the system board, DIP switches and jumpers after undoing six torx screws, though few offices or households would have the essential torxdriver for this task.

The Screen

Unclipping the keyboard exposes the plasma screen. Two latches on the top are released to allow it to be raised to a comfortable viewing height and angle. The screen hinges are strong and the guides for the bottom of the screen ensure that it does not drift down as it is used. A tilting/swivelling base is available as an option to raise the whole unit further, and allow additional flexibility in tilt and swivel, though I did not need it to get a perfect viewing height and angle.

At 640 by 400, screen resolution is excellent, and brightness (controllable by a knob at the lower right corner of the screen) is satisfactory even under very bright ambient light. In typical rooms,



from offices to dim home lighting, the screen is excellent. Emulation of CGA and MDA is also supported. Many packages already have drivers for the 640 by 400 resolution, and in this emulation Lotus release 2 gives a 50 row screen with no less than 45 active rows on screen after allowance for menus and so on. Lotus can also drive the screen in normal CGA mode with a lower resolution and a larger character size.

The character set is copied from ROM to RAM, and two alternative sets can be loaded simultaneously. The alternate set may be used for various purposes including the emulation of highlighting by use of a narrower font.

The screen auto-blanks after a preset interval (selectable by the user) and pressing any key restores it. This can create a small problem as the keystroke is registered and passed to any program which happens to be running. If the key pressed is accepted by the program and is not an appropriate selection at the time the results may be unexpected.

Two versions of the machine are available in Australia, with 20 Mbyte and 40 Mbyte hard disk drives respectively. In the US it can be had without a hard disc, but this would cripple a machine with performance like this one's.

Disc Drives

Two versions of the machine are available in Australia, with 20 Mbyte and 40 Mbyte hard disk drives respectively. In the US it can be had without a hard disc, but this would cripple a machine with performance like this one's.

The standard A drive is a 1.2 Mbyte floppy, though this can be replaced with a 360 Kbyte unit. But, why bother? Conventional wisdom holds that writing to a 360 Kbyte disk with a 1.2 Mbyte drive can result in unreliable reading of the disk when returned to a 360 Kbyte drive. During testing no such problem was found, and many disks were transferred from the Compaq to an aging PC with no trouble. Formatting 1.2 Mbyte disks is another matter. Ordinary double density disks that work fine in a 360 Kbyte drive may not be satisfactory for high density use and better disks should be used instead.

The hard disk is a voice coil unit with an average access time of around 30 μs depending on the test used. Parking and locking of heads automatically on power down ensures integrity of data on the hard disc, and the rated shock resistance of 20 G's while operating and 40 G's while parked, is reassuring.

The Keyboard

Unique amongst such a compact portable is the full keyboard. On the underside are two hinged feet to allow the rear of the keyboard to be raised to a comfortable typing angle. Most laptops have an emasculated layout without a separate numeric keypad, not so the Portable III. The normal AT type layout of the alphanumeric keys is employed, with 10 function keys in a row across the top. To the right is the usual composite cursor/numeric keypad plus the escape, Num Lock, Scroll Lock and so on. The three 'lock' keys all have LED indicates to show if they are in effect or not.

The keys themselves have excellent feel. At first, after coming from an IBM keyboard, they seemed a little hair trigger and without enough positive tactile feedback on depression, but adaptation was quick and touch typing quite easy. Soon the lighter touch was welcome and the feedback more than adequate. Overall the keyboard is excellent, though the placement of the asterisk key in the normal AT position is not as convenient as its position on a PC keyboard.

The keyboard is connected to the system unit by a coiled cord which is just a little bit short, and pulling the keyboard forward from the machine drags it a little to the right. Gentle stretching of the cord gives it a permanent set, allows a convenient keyboard position and still allows it to be packed away. The keyboard can be unplugged and an enhanced keyboard attached, but this cannot be clipped to the unit for travel.

Add-Ons

The Compaq Portable III has proprietary internal slots allowing expansion to 6.6 Mbytes and the fitting of an internal modem. The US modem will not be sold in

Australia, but Netcomm is preparing one. Communications were tested using an external Netcomm, without a single glitch. An 80287 can also be fitted internally, as it was to the test machine.

An Expansion Unit Option Kit is easily clipped on and off the rear of the machine in a matter of seconds, and connects to the system bus via the door mentioned earlier. It takes two full length AT style expansion cards, and allows the use of specialty cards like terminal emulators, EGA boards, and LAN boards.

Performance

The standard *Your Computer* benchmarks showed the Compaq to be one of the fastest ATs so far tested, and a range of benchmarks showed the III to be around six times as fast as the IBM PC. Sysinfo from the Norton Utilities indicated a relative speed of 11.5, but this should be discounted slightly as the particular instruction mix of Sysinfo always gives a slightly exaggerated apparent speed gain. Overall speed improvement relative to a 4.77 MHz PC is somewhere around 8.

Getting away from benchmarks, I used the Compaq and Microsoft Word 3.0 to create a table of contents, index of figures and index of tables on a very large document. This is a processor and disk I/O task which has no operator input. The Compaq Portable III took 10 minutes. A 4.77 MHz IBM PC took over an hour, the increased speed bearing out the benchmark results.

Compatibility

I ran Framework, Autocad, Lotus release 1a and 2, Microsoft Word 3, PC-Talk III, PC-File III, Norton Editor, Norton Utilities, Xtree, Dosedit, Whereis, Jet, and others. I didn't see the Mach 3 Cessna 182, but I am assured that most versions of Flight Simulator run properly. Compatibility rating is excellent, though the usual caveat remains — check out your own software.

I have never heard of reliability problems with a Compaq, and the Portable III didn't miss a beat in the very limited time it was available. The construction quality is excellent and the total effect is to give one complete confidence. Reliability based on the test is excellent, but remember that the test period was only a couple of days.

As tested, only a Operations guide was supplied. It is quite generous in size and well illustrated, but is rather limited in the volume of information included. I would not like to try to set up a system solely with it as a mentor. DOS manuals were not supplied with the test machine.

Versions of Pick and Xenix are available from third parties and Compaq indicates that they run satisfactorily on the Portable III, though they were not tested in the limited time available. If a user has a need for an operating system other than DOS the time needed to fully evaluate the hardware, operating system and software combination would be well spent.

The Compaq Portable III is yet another machine that had to be dragged away from me. It is very nearly the ideal size and performance package, with a full size keyboard, great screen and a footprint small enough to fit on any desk without disturbing anything already there. The blinding performance, as one of the fastest AT clones around, together with genuine portability and a full size keyboard make it a pacesetter that is hard to equal, nearly impossible to beat. □

	Compaq Portable III	4.77 MHz IBM PC	
bbb	4.8	26.8	5.58
sieve	2.48	14.71	5.93
lotus load	12.2		
lotus recalc	4		
lotus save	13		
My bench	1	5	5.00
" "	2	12	6.00
" "	2	12	6.00
" "	3	14	4.67
" "	4	24	6.00
" "	6	38	6.33
" "	6	37	6.17
AVERAGE SPEED INCREASE			5.74

The standard, Your Computer benchtests revealed that the Compaq Portable III is one of the fastest ATs around — six times faster than the IBM PC! The last column above shows times compared to the PC, defined as 1.00.

Product Details

Product:	Compaq Portable III
Supplied By:	CCA, 100 Harris Street Ultimo 2007 NSW (02) 660 0077
Processor:	80286
Clock speed:	12 MHz
Screen:	Plasma
Graphics:	640 by 400 resolution
Drives:	20 Mbyte hard disk, and 1.2 Mbyte floppy
Size:	40 x 25 x 20 cm
Weight:	9.1Kg
Options:	MS-DOS
Price:	$9671 inc tax

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- Formatting a disk - the FORMAT command, options, how DOS divides up and controls, a disk, using VDL to display the disk name
- Copying DOS - using SYS to transfer the system, using VER to check version number

COPYING FILES AND DISKS

- How to use all of the following: DISKCOPY, DISKCOMP, CHKDSK, COPY, COMP, RECOVER, DEL, DATE/TIME/TOD, PAUSE, TYPE, REM

USING FILES

- Definition of file types, file names, locating groups of files, creating DOS files, transferring files, copying and verifying files, non-standard DOS files

HIERARCHICAL FILING SYSTEMS

- What are they, directory structures, tree-structured directories, subdirectories, MKDIR, PATH, TREE, RMDIR, CHDIR, the file allocation table, recoving deleted files

EDLIN, THE EDITOR

- Getting started, inserting text, the template, interline editing, cut and paste with MOVE command, screen graphics and EDLIN, use of the following commands: COPY, DELETE, INSERT, LIST PAGE, REPLACE, TRANSFER, WRITE

REDIRECTION, PIPES AND FILTERS

- Redirecting standard input/output, SORT, FIND, MORE, CTTY, EXE2BIN, PROMPT, SET, ASSIGN, BREAK

BATCH FILES

- Automating the menu, activating the system CLS, CECHO, FOR, GOTO, IF...IN..DO, SHIFT, PAUSE, REM, AUTOEXEC.BAT

CONFIGURING YOUR SYSTEM

- CONFIG.SYS, BREAK, BUFFERS, DEVICE, FILES, SHELL, SWITCHAR, ASSIGN, CLS, CTTY, PROMPT, MODE, SET, the ANSI.SYS driver, communications

USING YOUR HARD DISK

- Preparing the disk with FDISK, organising a hard disk, directory structure, creating subdirectories, backing up a hard disk, RESTORE

DOS AT A GLANCE

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It's a HOT One!

For those who want to create their own menus

Hot is a powerful DOS shell that can read your disk and create a fully commented custom menu or a system of menus several levels deep. It's so good, says John Hepworth, it can even make DOS user-friendly!

NO-ONE has ever accused PC-DOS and MS-DOS of being too user-friendly. The arcane commands for many internal and external DOS services, and the need to remember not only the file name for the application, but also the directory in which it resides, has mystified many a novice and expert.

Every man and his dog have tried to overcome the problem by creating menu systems and DOS shells, with varying degrees of success, but most fail because they require too great a level of skill to create, customise or use.

Enter Hot, a very powerful DOS shell with a unique capability — it can read your hard disk, and automatically create a fully commented custom menu of all your applications. While it comes with a number of default subdirectories, Hot can be extended almost infinitely by the user till it becomes a system of menus several levels deep.

In addition, it allows the advanced user to add information on new applications to the datafile that Hot reads when creating that menu and also allows full customising of its other menu systems.

But it is not necessary to know anything about Hot before using it for the first time — just use the excellent default menu structure and enjoy the power offered. At first I installed and ran Hot just to see how it worked, starting without any customisations by me.

I went to make a backup copy of the distribution disk (Hot is not copy protected), placed the backup in drive A, logged to that drive and typed INSTALL. A batch file prompts for the drive and directory into which Hot is to be installed, creates that directory and copies the files across. The files on the floppy are verified before installation and the files on the target drive are verified after installation — a nice touch. A Hot.BAT batch file is created in the root directory of the appropriate drive, and when Install finishes the system is logged to the root directory on that drive.

Typing Hot and the batch file runs, and started Hot. A first menu appeared, with three options —

Select a HotMenu
Take the Hot Tutorial
Return to DOS

Selection can be made by pressing either the leading letter of an option, or by removing the reverse video highlight over the name with the cursor keys and pressing Enter. Start with the tutorial and when it is finished, you will be returned to that first menu.

Choosing the 'Select a HotMenu' option and the Main Menu appears. Here the options are HotBuild, running a disk file, XTREEjr, DOS disk Utilities, DOS help, DOS Mode, and a skeleton menu.

HotBuild

HotBuild is the subsystem which allows you to run commercial programs like Lotus, dBASE and other commercial, shareware and custom programs from within Hot and without any knowledge of DOS or the syntax for any or all of these applications.

When HotBuild was entered, three choices were offered — use an existing menu system, create a new menu of applications programs for the default drive, or change drives. The first time after Hot was installed, Hot did not know just what .EXE, .COM or .BAT were available on the hard disk so you must choose the option to create a new menu.

Hot then read a data file from the distribution disk called HB.DAT, which contained the name and extension of the file needed to start around 250 of the most common programs and a comment about each for inclusion in the menu. It also contains categories for each application like database, spreadsheet, communications and so on.

HotBuild looks through your hard disk, finds all files where the file name matches an entry in HB.DAT, and creates a custom menu for your hard disk. If you have a package that does not have a mention in HB.DAT it is included in a miscellaneous category without any pre-determined prompt, just the filename and extension appear. HB.DAT is an ASCII file and can be modified with you word processor or the editor built into Hot with the greatest of ease.

Using HotBuild to create a new menu for external applications takes a little time — a minute or so for each 10 Mbytes of hard disk attached to you system.

When you choose 'Use an existing menu' the next level menu allows a choice between accounting systems, communications, database management, educational programs, fun and games, graphics, integrated programs, programming tools, project management tools, productivity tools, special applications, spreadsheets, utilities, word processing, word processing extras, miscellaneous programs and DOS utilities.

By Merely taking the cursor down over the category in the pop up window, pressing enter and a new window appears showing a list of applications on your hard disk which fit that category, and includes descriptive prompts and the subdirectory in which they are located. Pressing the Enter key twice selects and runs the program. Exiting returns to the same menu ready to select and run another program.

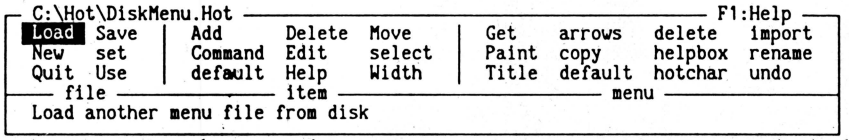


Figure 1. *Hot comes ready to run with a comprehensive menu system of its own which can be modified or whole new menus can be added. Shown above is the Chef menu which is used to create, delete and modify menus.*

Simple and easy, and almost enough reason to use and choose Hot even without all the other functions.

Running a Disk File

Back to that Main Menu, and the option now is 'Running a disk file.' This option displays the names of files 30 at a time. Files are selected by placing the cursor over the file name and pressing enter. The user can then add options if required, and the file is run by pressing enter a second time. When the program finishes running the user is prompted to press any key to return to Hot.

One can also run a file manually from anywhere within Hot by pressing Alt-C, and using any valid DOS command. At any time while in a Hot menu, or while running a program from Hot, pressing the shift key twice in succession brings up a pop up menu which has file finder, IWORD editor, a CTR saver, a calendar and a display of all those box drawing characters which can't be accessed form the keyboard.

Putting the cursor over the image of a hi-bit box character and pressing Enter injects the character into your program via the keyboard buffer — just the thing for drawing outlines within word processors which do not have a cursor draw function.

XTREEjr

Another choice from that second level menu is XTREEjr, which allows one to copy, delete, edit, print, rename, view and execute files. It is very much a cut down XTREE (which was written by the same people) with the addition of a simple editor called IWORD. The editor is quite reasonable, and has some similarity in its commands to the well known Wordstar.

One of the many helpful utilities in Hot is a thing called DOS Disk Utilities. This menu allows you to copy files, run CHKDSK, format disks and compare files, using in each case normal DOS utility programs run by Hot.

Formatting disks calls for another menu which asks the user to select the drive in which the disk is to be formatted, whether the system is to be a system or data disk, and if a volume label is required. Pressing R then starts the DOS FORMAT program running with the selected options.

If you do need help, there is a DOSHELP file which is a simple tutorial on the DOS commands, but it's not available while running a 'child' application from within Hot.

The DOS Mode is under the control of Hot and can send a command to set communications parameters, printer characteristics and printer redirection all from a menu, and without that reference to the manual that all of us seem to have to do to make sure that we are using the correct syntax.

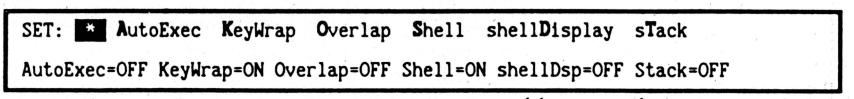


Figure 2. *The Set sub-menu is used to set the characteristics of files in a Hot menu. For example, Shell toggles between allowing, or not allowing, the user to enter the command shell, and Overlap causes Hot menus to overlap one other as they're called up.*

Skeleton Menu

One of the great strengths of Hot is that it comes ready to run with a comprehensive menu system, and at the same time can be readily extended by modifying existing menus, and by adding additional menus. To make the process easier a skeleton menu is provided so that users have a predetermined structure and an option within it to return to the main menu. Pressing Alt-E invokes the CHEF editor which is used solely to modify the menus, and a fairly simple process then allows users to create, delete, and modify menus.

One problem that some users may encountered is common to all shell programs. They all take up memory above DOS and thereby less memory is available for your application. Hot uses 128 Kbyte. Often this is not a problem, but if you have a memory hog like many spreadsheets, you may have to use Hot to run your other applications and a batch file for the hog.

The documentation that comes with Hot is a spiral bound 138 page, A5 manual. At first I found it a little difficult, and had problems in deciding just what the authors intended to say about Hot. I did find that using Hot needed little in the way of documentation, and I realised that the manual had made an excellent effort at explaining the use and customisation of the program.

I would expect that most novice users would take Hot as it comes, straight out of the box. Without customisation the manual is superfluous and the default menu system is self explanatory. More experienced users who want to make changes will find the requisite information in the manual. No index was included, and this is an unfortunate omission in any manual or technical book.

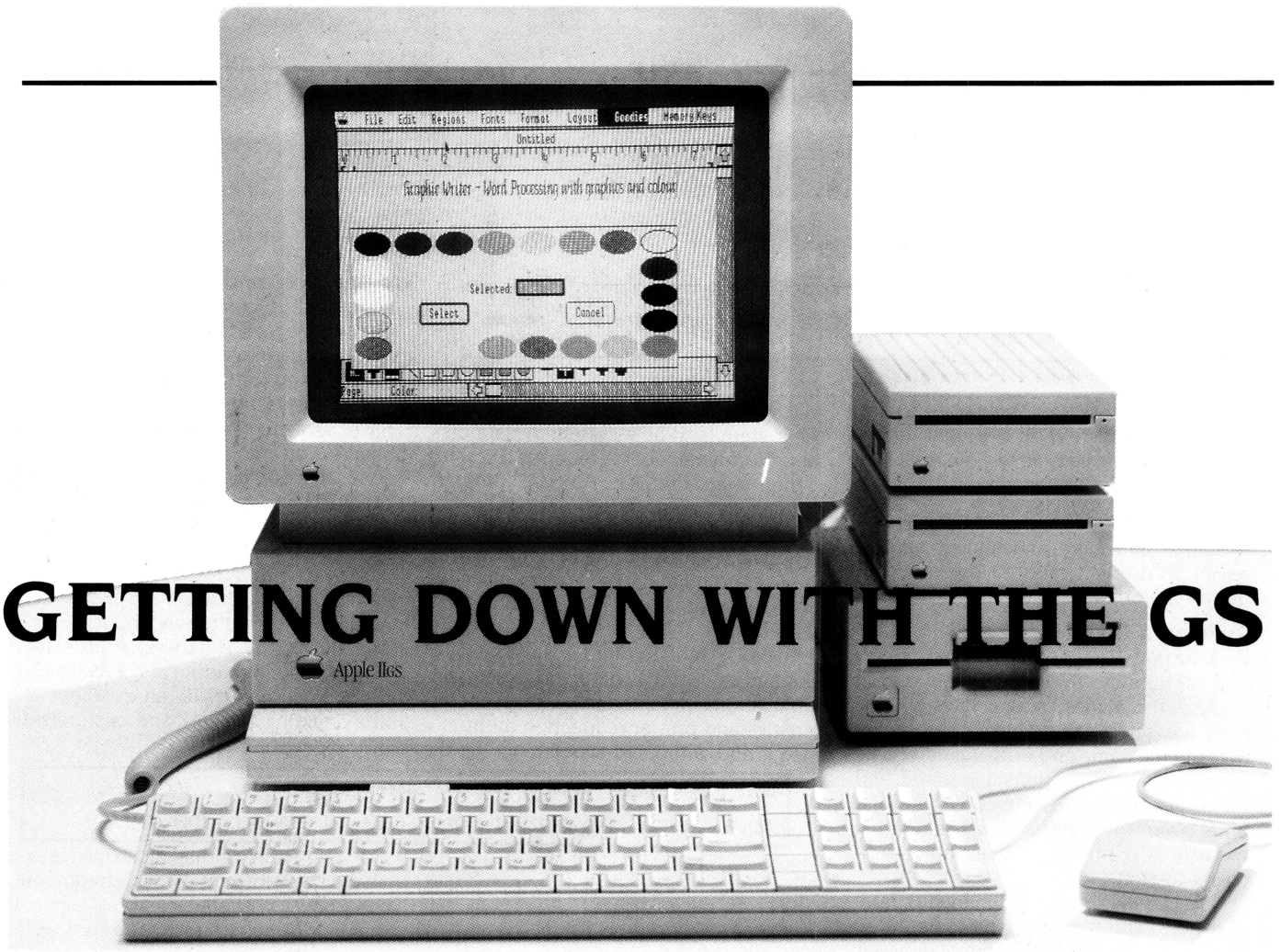
Value

For those of us always changing the applications on the hard disk and too lazy to rewrite a home-made batch file menu it is a godsend.

XTREE is my all time favourite utility program. Hot is second, but only just. Incredibly they are both written by the same people. The authors are clearly heavy PC users and enthusiasts, and their excitement about the product is seen in the way it looks, the fantastic way it works and the way they write about it in their manuals. Great stuff! □

Product Details

Product:	Hot
From:	Executive Systems, Sherman Oaks, California
Review Copy from:	Perfect Interface Australia PO Box 946, Crows Nest 2065 NSW (02) 957 6686
Price:	$195 taxed



GETTING DOWN WITH THE GS

THE APPLE II HAS taught a generation of kids of all ages that computers are fun *and* useful tools for education. It has allowed countless small business people to manage their day to day inventories and accounts.

It has helped thousands of writers (including this one) put words together in a better way — and get the spelling right. In a Sydney observatory, an Apple II controls the movements of a telescope as it scans the heavens. From the US, an Apple II travelled into space aboard a Space Shuttle to help with a scientific project.

Now Stephen Wozniak's much-travelled 8-bit micro has grown up and evolved into a 16-bit personal computer. At long last, the Apple IIGS is among us.

At $3,495 with monochrome monitor and a single disk drive and almost $4,000 for the colour monitor option, the GS is the most expensive Apple II yet. Where it will fit in a market of cheap 16-bit IBM clones selling for half as much, nobody is quite sure. Even Apple Computer seems shy about predicting the GS' rightful place in the universe.

'Education and small business,' is about all that is said officially — nothing about space shuttles, artists or professional musicians. With little fanfare (and even less advertising dollars) the new Wozniak Wonder Machine arrived Down Under. Not only are Apple uncertain about the market for the GS, but they are also afraid that the GS might pinch some of the Mac's potential market.

1987 brings the Apple II series of micros into their second decade of production. In the rapidly-changing world of personal computers, that alone is a praise-worthy achievement. But, as Tom Burrow found, the Apple II has earned it's stripes for doing a lot more than just surviving.

The machine *will* find its own niche in the market and so what if it steals some Mac sales?

The GS vs the Mac

If Apple is wise, it will recognise that a sale lost to the Mac and picked up by the GS is somewhat more desirable than a sale picked up by IBM or another competitor. However there are signs that the 'Mac Mafia' within Apple will soon have some competition.

Apple Australia's Peter Sandys has just taken over as 'champion' of the Apple II models and promises his full support for the GS. A II user from way back, this man is competent, knows his stuff and is keen to see the GS flourish.

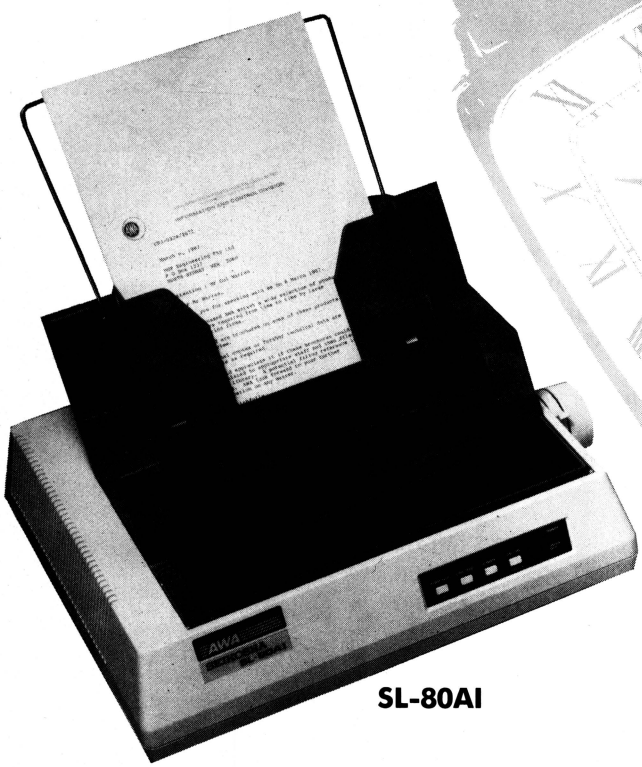
Having used the Apple IIGS since its first appearance last year, I predict that this computer will certainly flourish — eventually. Initially, the machine will mainly appeal to those who have had a soft spot for Apple II's since they first came off the assembly line a decade ago. That's around 3 million people worldwide.

And once Apple's traditional helpers — third party developers — come good with their best offerings, the market will broaden to include a great variety of people. (The Apple IIe and IIc will continue to be sold by Apple — a trio of II's for the time being).

But what is the GS really like to use on a day to day basis?

You've trusted us to keep you on time for years, now you can trust in our printers...

SEIKOSHA



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SP-1200

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Let's face it, there are times when NEAR letter quality is not quite near enough. Until now if you needed real quality printing you were forced into using an expensive daisy wheel.

Well, the AWA-Seikosha SP-80AI has changed all that. Its 24 pin printhead delivers premium quality output that compares very favourably with a daisy wheel - At around half the price.

Not only do you save money, but you get a lot more besides. You get features that no daisy wheel can ever offer. Features such as 135cps draft mode, graphics, down loadable character sets, double width/double height printing, cut-sheet feeder options and much more.

So if you want premium print quality without sacrificing all the advantages of a dot matrix printer, at the right price, ask your dealer to see the new SL80AI in action - You'll be suitably impressed.

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Introducing the AWA-Seikosha SP-1200 family. The very latest in PC printer design. No longer do you have to pay heavily for top quality printing.

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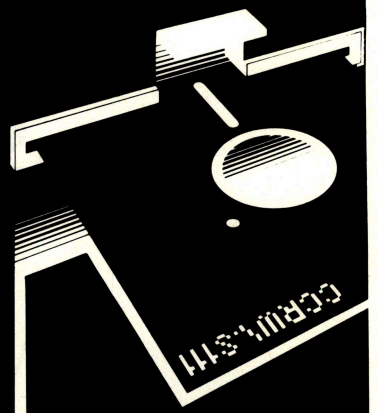

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Let me subjectively say that it *feels* like a unique computer to use and operate. Not like a Mac, not like an IBM or clone — not even like an Apple II. The GS *feels* as it looks — individual, elegant, innovative and just a touch yuppy.

The separate keyboard is the best that Apple has produced. The keys give good tactile feedback and are comfortable to use over extended periods. The mouse plugs into the keyboard and this can cause a minor irritation if you type with the keyboard on your lap. Too much movement will cause the mouse to be pulled off the desk and fall on the floor.

A simple solution to the problem is for Apple, or a third party developer, to provide a double keyboard adapter and cord extension to allow the mouse to directly connect to the back of the GS' main CPU. Personally, I don't do much 'lap typing' so the problem didn't arise. The few times I have, I've just unplugged the mouse.

Beneath the Gloss

Underneath the GS' platinum-coloured exterior lies a gold mine of goodies, waiting to be exploited by innovative hardware and software developers. The machine certainly provides all the tools necessary for this exploitations.

Software writers, both amateur and professional, have a wide range of programming languages from which to choose. (While the GS comes pre-packaged with Applesoft BASIC in ROM, it's nothing to write home about and is included for the sake of continuity). The respectable languages available for use by programmers include: Pascal, FORTH, C, SuperPILOT, Logo, PL/1, L:ISP, COBOL, Modular-2, and Fortran — as well as 65C816 and 6502 machine languages.

Disk operating systems for the GS include DOS 3.3, Pascal, ProDOS 1.1.1, ProDOS 8 and ProDOS 16 — the machine's native DOS.

The Western Design Centre's 65C816 chip at the heart of this machine gives the GS it's schizophrenic personality: it has the ability to run most of the current 16,000 Apple II software programs, as well as the new 16-bit GS programs.

According to Apple, 90 per cent of old Apple II programs tested on the GS have run without problems. Others will have to be modified somewhat if they are to be used on the new machine.

In emulation mode, the accumulator and index registers are 8 bits wide, allowing existing Apple II programs to run the same as they do on any other Apple II mode. In native mode, the accumulator and index registers are 16 bits wide. The 65C816 also has several new and more powerful addressing modes that take advantage of its 24 bit internal address bus.

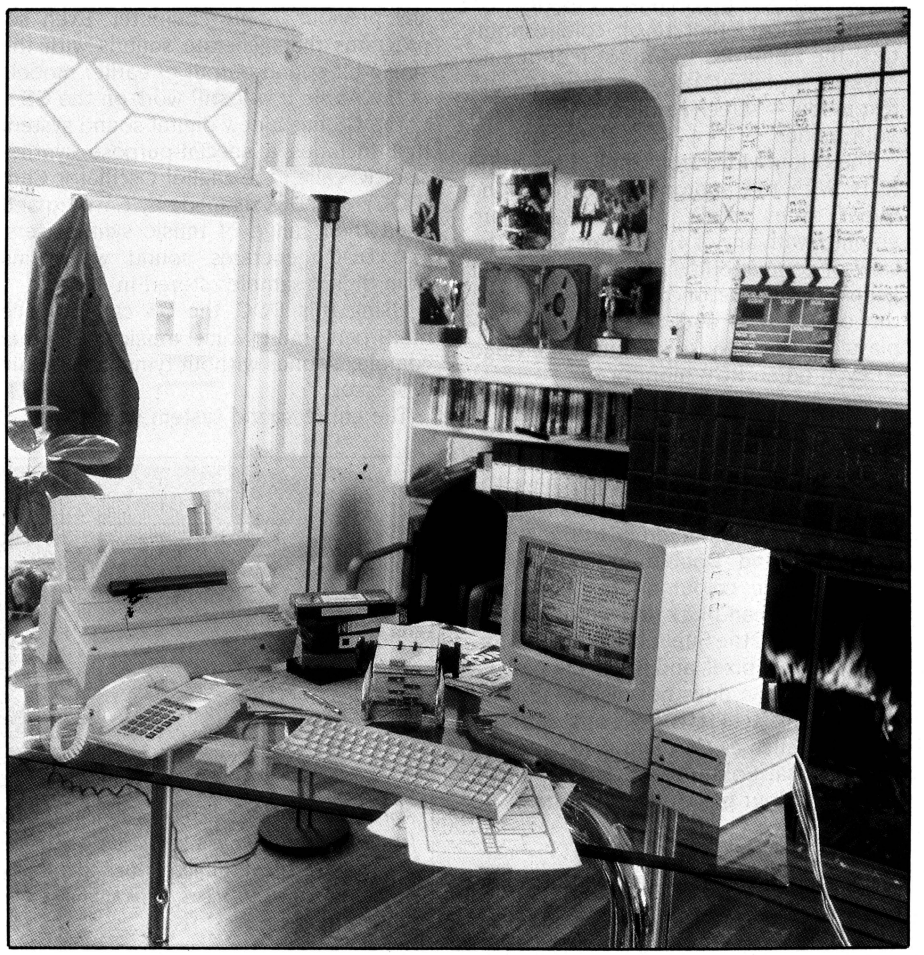
I predict that this computer will certainly flourish — eventually. Initially, the machine will mainly appeal to those who have had a soft spot for Apple II's since they first came off the assembly line a decade ago. That's around 3 million people world-wide.

Faster speed

Apple II users will appreciate the improved speed of programs running on the GS. The GS normally runs its 65C816 microprocessor at a clock rate of 2.8 MHz. For programs in RAM, the effective speed is about 21.5 MHz, because the hardware allocates a few clock cycles for refreshing the RAM — and cannot execute RAM instructions during the refresh cycles.

Programs in ROM are not affected by RAM refresh, so they run at full speed. But this faster operating performance doesn't only apply to programs specifically written for the GS.

Almost all programs can run at the 2.5 MHz speed on the GS — even those originally written for an 8-bit Apple II. The old 'standard' Apple II speed of 1 MHz can be manually selected by the user, simply



by setting this speed on the GS' built-in Control Panel program.

Setting the 'System Speed' ROM software switch to 'Fast' is not necessary in most instances as most ProDOS software will run at fast speed even with the switch set 'normal'. I've found that this is the safest setting to choose — especially if you are running games.

But improved speed aside. the greatest attributes the GS has to offer is its enhanced graphics and sound capabilities — the 'G' and the 'S' in 'GS'.

Black, White and Coloured

With an eye on the past, the GS also has standard Apple II video modes for graphics and text. But these traditional display modes are enhanced with a choice of colours for borders, text and background — for those with colour monitors.

The GS has an RGB colour and a composite video port, built-in. The graphics display has been enhanced with two new Super high-resolution (hi-res) modes.

Unlike most other 16 bit colour monitors, the Apple RGB Monitor requires no physical switching between graphics and text mode — screen resolution is sharp in both modes.

The colour video from the GS is analog RGB. With the appropriate monitor, the Super hi-res mode can display sharp graphics with any of 4,096 colours. For the sake of compatibility with programs that generate graphics for composite monitors, the older hi-res and Double hi-res displays on the GS look like composite video — even on an RGB monitor.

The two new Super hi-res graphics modes offer 320 horizontal pixels by 200 vertical, and 640 horizontal by 200 vertical.

In these modes, coloured dots have the same horizontal resolution as black and white dots. This is different to the standard hi-res and Double hi-res graphics modes, where coloured dots are effectively wider than black and white dots.

Each dot on the Super hi-res screen corresponds to a pixel, and pixels are indivisible: the screen does not display individual bits. But seeing is believing and new programs such as GS Paint distributed by International Solutions show off the GS' amazing colour graphics capabilities.

Sound System

Sound on the GS is really something special. In fact, the Apple IIGS has more powerful sound-generating circuits than any previous Apple computer. Even so, programs that generate sounds with the single-bit sound output of earlier models of the Apple II will still work on the GS.

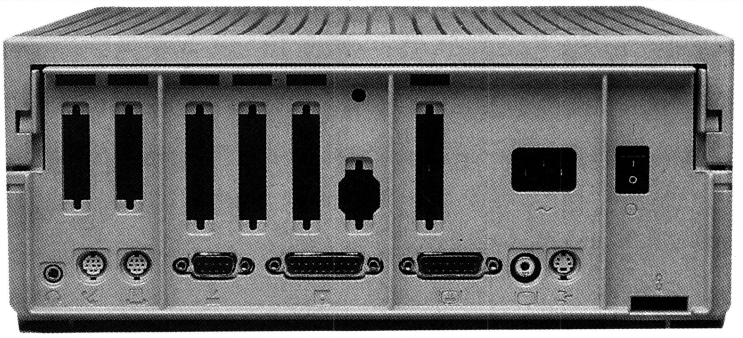
The GS has a new digital sound system that includes a special-purpose synthesiser IC called the Digital Oscillator Chip (DOC). This DOC is made by Ensoniq and used their range of music synthesisers. The DOC generates sound waveforms from digital samples stored in RAM.

Using this DOC, the GS can produce multi-part, multi-voice music and other complex sounds without tying up its main processor.

The entire sound system within the GS consists of the DOC, an audio amplifier and internal speaker, a connector for an external amplifier and speaker, 64 Kbyte of independent RAM for storing sound samples for the DOC, and a custom IC.

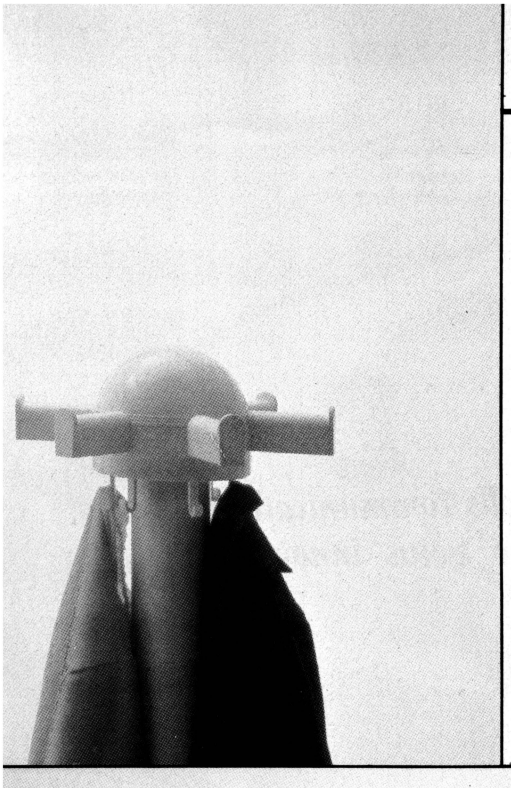
Sample programs have already demonstrated what this sound technology is really all about: the human voice, sound effects and music can be reproduced within stunning accuracy on the GS.

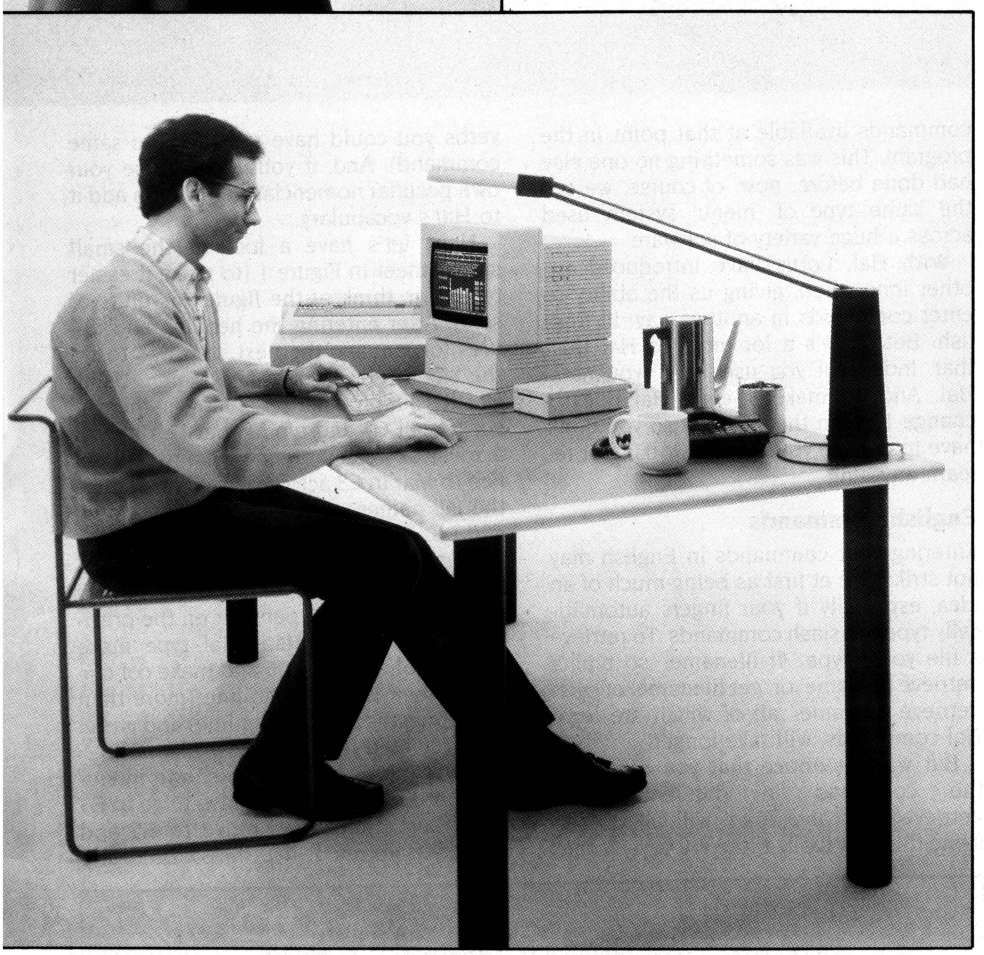
One music program already available, the Music Construction Set, includes a grand piano, honky tonk piano, guitar, banjo and percussion instruments in it's repertoire. More innovative sound software is on the way.



Apple retained Apple II style expansion slots (existing Apple II expansion cards will slot straight in) for the GS, and built in a headphone jack, modem and printer ports, Appletalk networking, a 'smart port' controller for both micro- and mini-floppy drives, RGB video, composite video, and a 'desktop bus' connector which allows daisychaining up to 16 input devices including keyboard, mouse, barcode readers, whatever.

Apple IIGS





Ports A'plenty

The practical design of the Apple IIGS is largely the result of feedback from users and third party developers — plus the talents of Apple's in-house technicians. For one thing, the GS has more in and out ports than the Maritime Services Board.

Seven in/out slots, one memory expansion slot, eight plug-in ports for sound, modem, printer, AppleTalk network, and so on, and up to sixteen chained inputs via the GS keyboard bus. If 32 ports are not enough, you could always buy an industry-standard SCSI (scuzzi) card to chain a hard disk, printer and a few other bits together.

By the way, the Apple Hard Disk 20SC for the GS will load 1.25 Mbytes of program code, each second, via the SCSI card. No waiting for your software to load.

In Australia, the GS hs been released with 512 Kbyte of RAM as standard, but this 16-bit system will directly address up to 8 Mbytes of memory. In the US, Applied Technology has released a 6 Mbyte RAM card for big-memory operators.

But because it uses expensive one megabit chips the card costs over US$3,000. It is expected that the price of these chips will eventually drop in price, lowering the price of the card.

Other developers have been hard at it too: Micro Trend has a GS CD-ROM card that will work with Philips and other CD-ROM players. And to put you in the picture (literally) a real-time image digitiser should soon arrive on the scene from AST.

As far as the local scene goes, NetComm Australia has developed an integrated communications software package. This allows GS users to access services such as Minerva, Austpac and Viatel. The software also provides for computer to computer communications.

Bleeding Problems

The first GS machines released here had trouble with a faulty LSI chip which caused colour-bleeding in some display modes, but did not affect the way the machine operated. Apple will provide replacement chips to be installed by an authorised Apple dealer — they are not user-replaceable.

Those still using these 'first off the assembly line' machines can get around the colour-bleeding problem by selecting 'monochrome' display mode from the Control Panel. With few exceptions (Supercalc 3A, for instance), programs will still be displayed in colour with an RGB monitor.

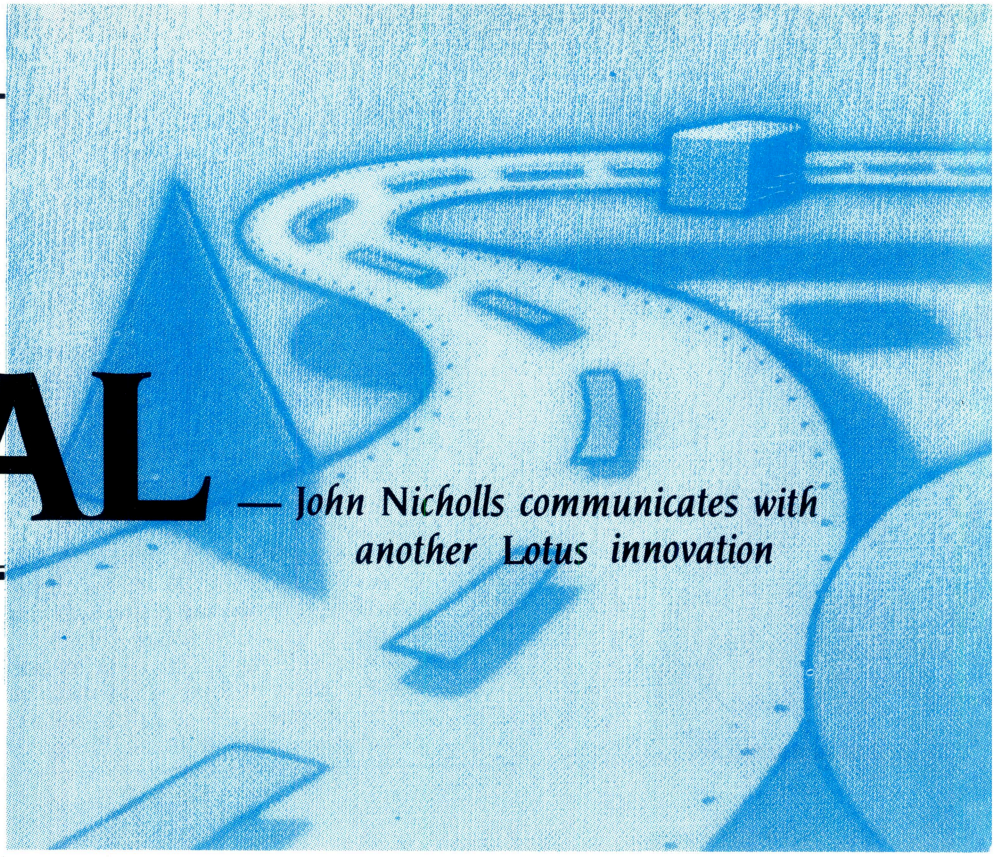
While some might regard a colour display as unnecessary, I would strongly urge potential GS buyers to consider this option. Most of the new 16-bit software programs written for the GS exploit the machines's Super hi-res colour capabilities — GS paint, for instance.

GS Paint (also released under the title of Paintworks Plus) is 'MacPaint in Technicolor' and includes a colour animation mode for Disney-type dabblers. At $149 (local price) it should be the GS owner's second software purchase, after AppleWorks 2.00.

Visualizer is another impressive GS colour program which allows you to convert AppleWorks spreadsheet files into sophisticated colour 3D graphics.

Power number-crunchers will be pleased that VIP Professional is now available for the GS. The program is really Lotus 1-2-3 with a Mac-type interface and allows the creation spreadsheets up to 8,000 rows in size, a database and colour graphics.

It is still early days for this new-decade, 16-bit Apple II and the best is yet to come. Apple has done it's bit and done it well. The machines's ultimate success lies in the hands of the third party developers — and the users. □



HAL — John Nicholls communicates with another Lotus innovation

'Open the pod bay doors, HAL.' 'I'm sorry, Dave, I'm afraid I can't do that.'

THOSE LINES OF dialogue above are probably familiar to you: the movie 2001 introduced most of us to the concept of an 'intelligent' computer (or, more strictly speaking, 'intelligent' software). Those same lines reappeared during a Sydney demonstration of Lotus' Hal by one of its designers, Bill Gross. Bill typed in the first line as an instruction to Hal and the software replied with the second. Later I'll explain how this was done.

What does Hal do? Well, as software has become more sophisticated, that question has become harder to answer in a few words. Even Lotus have difficulty explaining it. The 'explanatory' parts of the text from one of their advertisements reads —

Lotus Hal is a memory resident companion product for Lotus 1-2-3 that enhances the full range of 1-2-3's capabilities — and adds new ones.

It increases 1-2-3's power and flexibility so you can work more efficiently and become more productive than ever before.

Doesn't say much, does it?

So, to start answering the question of exactly what it is that Hal does, let's take a brief look at the 'companion product.'

Lotus 1-2-3

What we have today in Lotus 1-2-3 Release 2.01 is an improved version of the original release. It's still a spreadsheet made up of columns and rows, that uses keys for moving around the spreadsheet and commands for other operations.

The original had a way of entering commands that was an improvement on anything else available at the time — pressing the / key produced a single line which listed in *complete* words all (and *only*) the commands available at that point in the program. This was something no one else had done before; now, of course, we see the same type of 'menu' system used across a huge variety of software.

With Hal, Lotus have introduced another innovation, giving us the ability to enter commands in another way: in English. But there's a lot more to Hal than that. Indeed, if you use 1-2-3, you need Hal. And, to make it easy, Hal doesn't change 1-2-3 in the slightest so you don't have to change your way of working or relearn anything.

English Commands

Entering your commands in English may not strike you at first as being much of an idea, especially if your fingers automatically type the slash commands. To retrieve a file you'd type '/fr filename,' so typing 'retrieve filename' or 'get filename' or even 'retrieve filename,' all of which are legal Hal commands, will take longer.

But wait — notice that you can enter the command in different ways: 'retrieve','get', and 'load' will all do the same thing (actually there are seven other verbs you could have used for the same command). And, if you want to use your own peculiar nomenclature, you can add it to Hal's vocabulary.

Now, let's have a look at the small spreadsheet in Figure 1 (to make it easier to follow, think of the figures as units of sale). After entering the heading and figures for January, the next step was to do the same for February and March. Using Hal, it's simply a matter of moving the cursor to cell C3 and typing 'put Feb to Mar across', or we can enter from any cell 'put Feb to Mar in C3 across.' Either one enters the *full* names of the months in cells C3 and D3.

In our example spreadsheet, let's assume modest improvements in February and March, say, of 5 per cent on the previous month. To do this in Hal, type 'make col b = col a times 1.05 and make col c = col b times 1.05' on one line (more than one request is allowed per line) and *presto*! the calculated figures appear (Figure 2).

To get the 'Total' column shown in Figure 3 without Hal, first we have to go to E3 and enter 'Total,' then move to E5 and enter the formula @SUM(B5..D5); and

1	A	B	C	D	E
2					
3	Location	January	February	March	
4					
5	Sydney	5063			
6	Melbourne	3622			
7	Perth	1024			
8					
9					
10					

Figure 1. *The example spreadsheet — using Hal it can be built up using simple English commands.*

last, we copy the formula to D6..D7. With Hal we simply type 'total all rows.'

Now we come to the fun part — let's total the columns as well as the rows. Type 'total all cols' and we get Figure 4. Note that Hal has entered a dotted line to separate the totals from the rest of the figures. If we locate the cursor anywhere inside the table, typing 'Graph this' produces a bar graph on screen; other types of graphs can be specified just as easily by telling Hal what we want ('Graph this as line'). 'This' to Hal means the current table, defined as 'the area of the spreadsheet containing the cell pointer and bordered by two blank rows and two blank columns or the spreadsheet border.'

With Hal, Lotus have introduced another innovation, giving us the ability to enter commands in English. But there's a lot more to Hal than that. Indeed, if you use 1-2-3, you need Hal.

Starting Hal

The manuals go through the process for copying files in painstaking detail, making it seem more complicated than it really is. If you're using a hard disk, all you do is to copy all files on the two diskettes into your 1-2-3 directory. No installation is necessary and the disks are (at last!) not copy protected.

To load Hal, you enter 'Hal' and the program loads it first and then 1-2-3. 'HAL ' appears at the bottom of the screen just like the CAPS indicator. To invoke the program, you press and a 'Request' box appears in place of 1-2-3's menu (Hal doesn't work with the Lotus Access system or with PrintGraph, so you have to use them as separate programs). When you enter a Hal request, the program goes through it word by word, a process called parsing. If it finds a word it doesn't recognize, it beeps and points to the word it doesn't understand.

Hal's Vocabulary

All Hal's requests start with a verb; all told it has a vocabulary of more than seven hundred words (that seems more than adequate since I know people with smaller vocabularies than that and they seem to get along all right). As I mentioned earlier, you aren't limited to the vocabulary Hal comes with; you can create five different kinds of synonyms:

1) A single word to replace a Hal word,
2) A single word to replace a phrase,
3) A single word that invokes a series of 1-2-3 commands,
4) A single word that invokes a series of 1-2-3 commands over a range of cells, and
5) A single word that conditionally invokes a series of 1-2-3 commands over a range of cells.

An immediate use I thought of for synonyms was for print sequences, which are often long and complicated.

You can abbreviate any Hal word to its first three letters, such as col for column. Occasionally this can lead to a problem: 'Total all rows' won't work if you have a row name Allison. Rewording the request to 'Total every row' will fix this.

A possible source of confusion arises from the use of the words delete and erase. The differences are that 'delete' (drop, omit, remove) removes an entire row or column; 'erase' (clear, clr, scratch) clears the data, leaving blanks where you can enter new data.

Undo

One sorely needed feature in 1-2-3 has been an undo key; this is now provided with Hal and works with 1-2-3, too. To make this process work, Hal backs up the worksheet to disk whenever you press 'return' after entering a Hal request, and, also, when you press any key in 1-2-3 that could lead to a worksheet change.

Undo works on the last action, except that if you issue a number of Hal requests on the one line, Undo will undo all of them at once. Pressing Undo a second time restores the previous position, so you can toggle between two sets of figures. Thus as well as using Undo to correct mistakes, you can use it to try out 'what-if' analyses and restore the worksheet to its

	A	B	C	D	E
1					
2					
3	Location	January	February	March	
4					
5	Sydney	5063	5316	5582	
6	Melbourne	3622	3803	3993	
7	Perth	1024	1075	1129	
8					
9					
10					

Figure 2. *With a single, English command, Hal (and 1-2-3) can recalculate the spreadsheet using a formula entered as part of that same command.*

	A	B	C	D	E
1					
2					
3	Location	January	February	March	Total
4					
5	Sydney	5063	5316	5582	15961
6	Melbourne	3622	3803	3993	11418
7	Perth	1024	1075	1129	3228
8		---	---	---	---
9		9709	10194	10704	30607
10					

Figure 4. *Simply enter 'total all cols' and Hal does the rest, including adding the dotted line.*

	A	B	C	D	E
1					
2					
3	Location	January	February	March	Total
4					
5	Sydney	5063	5316	5582	15961
6	Melbourne	3622	3803	3993	11418
7	Perth	1024	1075	1129	3228
8					
9					
10					

Figure 3. *To get the Total column without Hal, first we have to go to cell* E3 *and enter 'Total,' then move to* E5 *and enter the formula* @SUM(B5..D5); *and last, we copy the formula to* D6..D7. *With Hal, we simply type 'total all rows.'*

original state. People who use Undo in word processors to move blocks of text around will be familiar with this concept.

Help

In Hal, context-sensitive help takes on a new dimension. Pressing the F1 (help) key when the request box is empty gives you an index of all the available help topics. As in 1-2-3, the help is appropriate to the request you have entered, that is, it is context-sensitive.

Pressing F1 a second time brings up a list of all words you can enter at this particular point. This isn't part of a written help screen; it is created on the fly and lists any synonyms you have added as well as those originally in Hal's vocabulary.

Function keys

Lotus doesn't provide a key template with Hal for the function keys as they did with 1-2-3, but they are quite straight-forward, as can be seen in Figure 5.

Key	Lotus 1-2-3	HAL
F1	Help	Help (Press again to show 2nd level
F2	Edit	Edit
F3	Name	Review backward
F4	Absolute	Review forward (Abs in Point mode)
F5	Goto	Goto
F6	Window	Translate
F7	Query	Transcript
F8	Table	Table
F9	Calc	Calc
F10	Graph	Graph
Backspace		Undo

Figure 5. *Hal's function keys.*

Other Features

Review backward and Review forward: F3 scrolls backward through the last 500 characters of requests you have entered in the current work session. F4 does the same in the reverse direction.

Translate: If you are uncertain what the effect of a request might be, you can enter the request and press F6 before pressing return. This will display the 1-2-3 command that corresponds to your request in abbreviated form (/FR instead of /File Retrieve). Some Hal requests do not translate directly to a 1-2-3 command.

Transcript File: Hal uses a transcript file to store requests and keystrokes you enter in the request box. You start and finish recording whenever you want. You can use this file to review what you've done, edit the file to create a macro, or use it to teach someone how to do something. You can add comments as you go.

Linking worksheets: By using this facility you can link spreadsheets so that updating a cell in one, automatically updates a specified cell in the other. There are some limitations, notably that both must be in the same directory. You can also remove links ('Unlink') and 'Show links.'

Auditing a worksheet: One of 1-2-3's shortcomings has been that it has been difficult to see if a large worksheet is correctly constructed. Macros written by someone else are usually impossible to understand. Hal provides a solution by highlighting or listing relations, dependencies, and formulas, and by writing understandable macros.

List relations: I fully expected this function to print 'one wife, three children, twenty-seven first cousins, ... but it actually refers to cell relations. In our sample spreadsheet, this request would produce the output shown in Figure 6.

As well as listing cell relations from the current table, you can specify a particular range or cell. Highlighting, instead of listing, can be a preliminary step. You can also show dependencies or cells containing formulas.

Macros: Hal Macros are in plain English, more-or-less; if I were running things I'd want *all* macros to use Hal to make them intelligible and to give the user a fair chance of checking them. Hal macros can also include if-then statements and include message requests to make the macro interactive. By using if-then statements and message requests you can duplicate the dialogue at the start of this article.

Nuts and Bolts

Lotus Hal works with 1-2-3 Versions 1A, 2 and 2.01. On my computer 1-2-3, Release 2.01 occupies 177 Kbytes of low memory and Hal a further 120. I have 304 Kbytes of expanded memory, but with Hal's Undo buffer in operation this drops to 32; the remainder of expanded memory is automatically reserved for the Undo buffer. If you need this memory, you can instruct Hal to drop the Undo feature ('Undo off'). Running out of memory may be your biggest problem with Hal.

Hal is available at present only for IBM, Compaq and AT&T computers and requires 512K memory. It costs $334 so the combination of 1-2-3 ($1054) and Hal costs a hefty $1,388.

Conclusions

As far as I am concerned, you can keep Symphony and Symphony Spellcheck and Symphony Text Outliner and 1-2-3 Reportwriter — they serve a purpose although I think most 'add-on' programs are overpriced. Hal is different — it should be an integral part of 1-2-3 and the two should be packaged as a set. If you're a novice to 1-2-3, you'll love Hal's ease of use; experts will love its extra features — either way it's a must. □

```
The formula relations in A1..E9 are:
-------------------------------------
Totals per Location = SUM (January through March)
Totals per Month = SUM (Sydney through Perth)
```

Figure 6. *Hal's 'List relations' facility shows the defined relationships in the current spreadsheet.*

Product Details

Product:	Lotus HAL
Manufacturer:	Lotus Development Corporation
Distributor:	Imagineering 77 Dunning Ave, Rosebery 2018 NSW (02) 697 8666
Price:	$334 plus tax

SYSTEM BUILDER

— *for your own applications*

In the past couple of years Rose Vines has sampled 18 databases for YC and now finds her database palette is just a bit jaded. Since she's being a bit picky, we served her this one to titillate the taste buds: The verdict is 'yum.'

SYSTEM BUILDER IS different from its competitors in a lot of ways, not least of which is its Pick background. Almost every other product I've looked at has been designed for the MS- or PC-DOS environment, CP/M and its variants, or the Apple Macintosh. System Builder runs under Pick (there's also a Unix version), and programs built with System Builder can be transferred without modification from one Pick-based machine to another.

This means you can use System Builder under Pick on an IBM PC or compatible (and Pick is multi-user so you can have multiple terminals running off your system if your processor will stand the strain — no need to hassle with networks and site licences), and then transfer your system to a minicomputer with next to no trouble.

If you don't like, want, or have Pick, you can still use System Builder with DOS by running it under Revelation, a Pick-like database system. This is the version I tested, and while working within Revelation is not lightning fast, I had few complaints about the performance of applications developed with System Builder. The main hassle is the time Revelation spends loading and attaching various files, but on my Ariel AT compatible, this was in no way unbearable.

System Builder is also different from other database systems I've used in that it isn't really a database system at all: It's an applications generator. In combination with Pick or Revelation, it provides all the facilities of database systems, together with very powerful tools for producing complex applications. And you don't need to know anything about Pick or Revelation to use it.

By the Book

System Builder comes as a set of three program disks and two tutorial disks (plus a Revelation disk if you need it). The documentation consists of a user guide and a 400 page, disk-based reference manual.

The user guide is as close to perfect as any documentation I've seen. It is beautifully and clearly presented, with colour coded sections, a good index, and VIP (Very Impatient People) Sections, for those who don't like manuals. The guide provides all the basics for getting started and using the System Builder tools, while all the detail is contained in the online reference manual. The guide is divided into four sections covering installation and housekeeping, the online tutorials and reference, using System Builder (with a description of the 16 System Builder Tools), and technical tips, which includes an excellent overview of designing systems.

The guide could well serve as a model for anyone developing their own documentation and, quite rightly, the author is given a credit in the opening pages; most manuals don't mention their author — usually to protect the reputation of the guilty.

The online reference is comprehensive and quite readable, but it's certainly a technical jump from the user guide. It's accessible at all times: all you have to do is type '?' at any input prompt and you get a two-line memory jogger about the current command or operation; type '?' once more, and the full reference text is displayed, which may be anything from a paragraph to pages of information. ▷

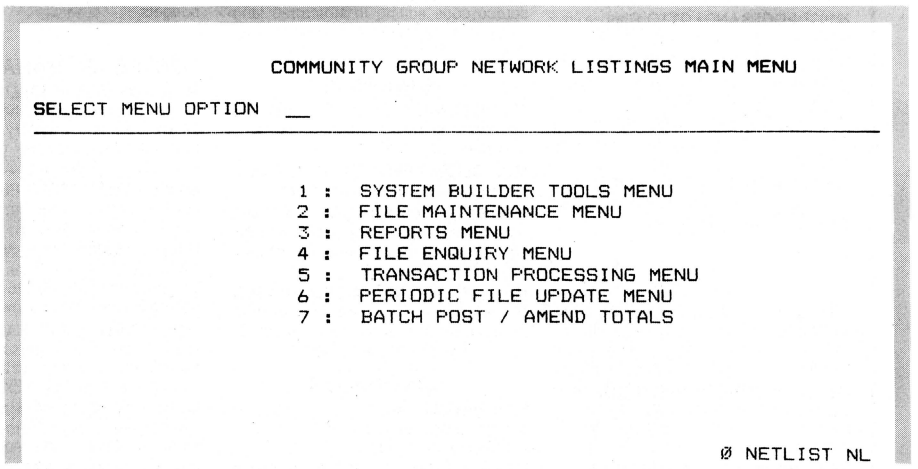


Figure 1. *System Builder's Main Menu is created by selecting the Setup New Account option from the Administration Menu. From the Main Menu, users have access to both development tools and the developed system itself.*

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U127. SQUEEZE LIST. Lists squeezed library files.

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The advantages of having the reference online are that immediate help is available at the press of a key; the help is context sensitive — that is, the program automatically displays the pages relating to the command you are working with; you can't lose or misplace your manual — and it's easily updated.

Some of the disadvantages I found were that it is difficult to get help on a command other than the one you are currently using; there's no quick index of commands or operations available; and you can't take the manual to bed! I often use reference manuals as bed-time reading, but with an online manual, this can be somewhat uncomfortable.

System Builder provides a routine for printing out all of the reference manual's 400 pages, neatly formatted and with index and glossary, and I think anyone using it will want to do just that. However, it takes a long time, a good printer ribbon, and a fair stack of your own paper, and I object to having to pay for printing a manual. I can live with this, but I would like to see an online index and glossary, and a system — such as the one in dBase III — where you can easily access information on any command, without having to position yourself in the appropriate section to use the context sensitive help. Context-*insensitive* help is a definite need.

Builder's Apprentice

The best way to learn System Builder is to read the first few sections and the Technical Tips section of the user guide (leave the Tools description until later) and do the online tutorials. There are 13 tutorials that give a tour of most of System Builder's features while developing a usable, or modifiable, multi-file application. You can do the tutorials interactively, with System Builder prompting you to enter the appropriate command or data, or you can set them on auto pilot, with the system providing all the answers.

I found the tutorials easy to follow and had a fair understanding of all the Tools by the end of them, but they didn't give me a good picture of the flow of operations in developing a system: I felt like I knew *how* to do something, but not necessarily *why* or *when* I should do something. The Technical Tips chapter of the guide was a bit more help here.

The tutorials did give me a feeling for the power, scope and consistency of System Builder, and were a good starting point. I chose to do them the hard way — interactively, with me doing all the work — and I'm sure it was worth it. On completion, System Builder automatically printed a certificate documenting my achievement, and stating I was now capable of creating and designing working programs. Maybe, but I still felt I had a lot to learn.

The Menu System

Perhaps one of the most remarkable things about System Builder is that is almost completely menu-driven. An application of awesome complexity can be built just by choosing the appropriate options and then answering the prompts.The top-level menu is the System Builder Administration Menu, which controls setting up new applications, running the tutorials, printing the manual, and backing up to diskette.

The Main Menu, shown in Figure 1, is the next level down. It is created by selecting the 'Setup New Account' option on the Administration Menu. When you choose this option, a whole series of skeleton files is created for use in developing your application. Thus there will be a Main Menu for each application you develop, and it will normally appear as the first menu.

The Main Menu gives access to both development tools and the 'live' system you've developed. You can password protect a complete menu or any element of a menu so only authorised people can use certain functions. Thus, you could let your operating staff use the live system, but not the development tools. Most of the options in the Main Menu will have no function until you develop your application: It is merely the skeleton set up for you by the Administration Menu. For example, the second choice on the Main Menu — the File Maintenance Menu which lets you build and update information files — will be empty until you design and create the appropriate file structure and data entry screens using the Tools. The same applies to the other options on the Main Menu.

The heart of the development system is the Tools Menu (Figure 2). You use the Administration Menu to set up an applications skeleton; you use the Tools Menu to fill in that skeleton and define the specifics — the file structures, screens, reports, batch processing procedures, transaction processing, periodic processing and sub-menu formats. You can also use the Tools to develop documentation, online help, and online tutorials.

Inside the Toolbox

The Tools Menu contains 16 options. The starting point for developing a specific application is file creation (Tool 1). When you choose this option, System Builder prompts you for a file name (up to 12 characters long), the number of fields in your file, the approximate number of records you expect to store, and the average size of each record in the file. It then allocates space on the disk for the file.

You can see already that some work is required on your part. System Builder takes care of all the technicalities of developing an application, but you must know — before you start — exactly what you want to do with the application. You not only need to know the approximate requirements for file storage and your file structure, you must also have a clear idea of all the relationships between different pieces of information in your system. System Builder gets rid of the need for a programmer, but you certainly need someone with a clear idea of how the system should work to guide you through the development process.

After creating your file(s), you use the second tool to define the fields within the file. The field definition process is of great importance, because it is at this level that you define everything from field size to complex inter-file relationships between fields. System Builder prompts you through field definition, which includes defining the field name, description, position in the record, type (alphanumeric, numeric or date), length, right or left justification, report heading, conversion procedures, correlatives, default values, validation codes, and help messages.

Options

Some of these options need a little explanation. System Builder uses the first field in each file as a key field; it is assigned position 0, and any information in the file can automatically be retrieved by searching for the appropriate key value. You can also have what's called a multi-valued field (an array), which lets you dynamically determine the size of a field. For example, you could define a field ADDRESS with size 30 characters and position 2.M in your field definition (the 'M' indicates multi-value). You can then define other fields as sub-positions within that field, such as ADDR1, ADDR2, SUBURB, and POST-CODE. The entire field can then be referred to as ADDRESS to retrieve or modify one or more of the sub-positions.

Perhaps one of the most remarkable things about System Builder is that is almost completely menu-driven. An application of awesome complexity can be built just by choosing the appropriate options and then answering the prompts.

The parent field — in this case ADDRESS — can have as many multi-values as needed, and the number need not be defined. This neatly gets around the problem of having a mailing list with some addresses taking only three lines and others taking six or seven; System Builder adjusts to the appropriate length, and you don't have to define your field for the 'worst case'.

Conversions are codes used to change data from one form to another appropriate for display or reports; for example, you could enter an amount as 233450 which, using a conversion code, could be displayed as $2,334.50.

Correlatives are codes used by System Builder to relate one piece of information to another, make calculations, or extract data from elsewhere. It's almost easier to list the things you can't do with correlatives than those you can — they're powerful! Basically, a correlative derives its value from somewhere else: you can use a mathematical or string expression; take its value from a field or part of a field in the same or another file; take the value from an expression involving other fields from the same or a different file; use the system time, date, the current system port to which your terminal is attached on a multi-user system, or your system ID as the correlative value; write a UFO (User Formulated Option) or BASIC program to produce the value; and so on.

A couple of examples would be extracting part of an account number to use as a branch or area code, or calculating an AMOUNT-DUE field by subtracting the AMOUNT-PAID from the BALANCE in another file.

In addition to all this power, correlatives have the advantage of taking up no room of their own (because the value is derived from other values in the system), and the value is automatically updated when the original fields or record values are updated.

When you define a field, you can also define a help message to appear if the operator needs help in filling in the field correctly. You can write a two-line memory

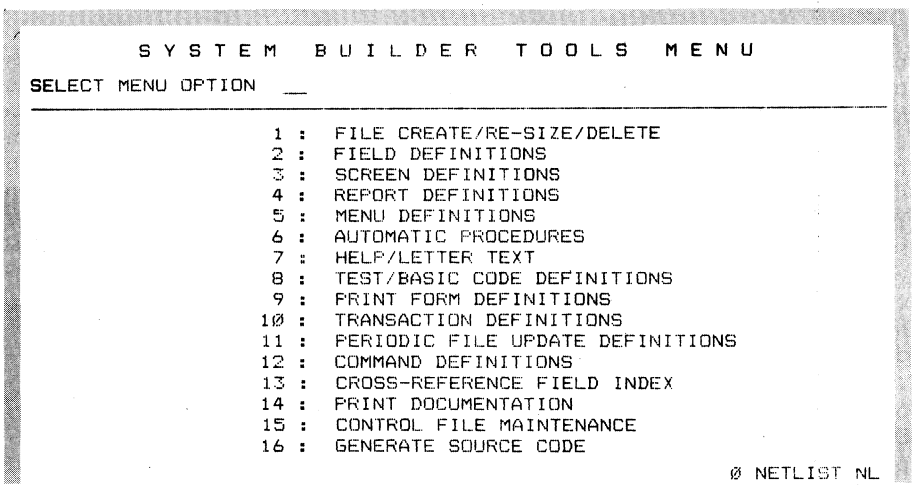

Figure 2. *The Tools Menu is the heart of the development system. It's used to fill in the applications skeleton by defining the file structure, screens, reports, batch processing procedures, transaction processing, periodic processing and sub-menu formats. It can also be used to develop documentation, and online help and tutorials.*

jogger, which will appear if '?' is typed in the field when entering data; or you can write pages of help to provide detailed background on a particular field or function. This detailed help is accessed by by pressing '?' a second time, after viewing the two line memory jogger. You give your help screens a code and develop the screens using Tool 7 (you can also use this tool to develop letters which can merge data from System Builder).

I haven't listed all the facilities and options provided in the field definition procedure, but you can be assured they're comprehensive. You can define complex default values and validation tests or procedures (including lookup files to check a value is contained in another reference file), and you'll find much of your effort in developing an application is concerned with field definition. Because of the powerful relational features of correlatives, much of the processing involved in your system will be accomplished during this field definition procedure.

The screen and report definition procedures use a screen-painting technique: you draw the format directly onto the screen, and System Builder then builds the appropriate data entry, data enquiry or report procedure from the screen format. This screen-painting technique is used in a lot of database systems, such as dBase III, Dataflex and Powerbase, and I've often found it less than adequate. It's quite often difficult to move around the screen fluidly, and modifying a screen can be troublesome.

System Builder has the easiest screen-painting system I've used, with modification a breeze and useful options supplied for setting up the way the screen will work in action. It also supplies a grid pattern to make it easier to place items correctly on the screen — especially useful for reports. You can make multiple-page data entry screens with ease. Reports can be developed using Tools 4 and 9: Tool 4 will create simple reports with one record per line; use Tool 9 to create complex report designs, with one record per page.

Once you've defined a screen or report or any other procedure, you use the Menu Definitions Tool to place it in the appropriate menu. Thus, under your File Maintenance Menu you could place your MASTER DATA CAPTURE screen and BRANCH FILE DATA ENTRY screen, and under the Report Menu you could have the MASTER NAME & ADDRESS LISTING, a MONTHLY SUMMARY REPORT and a WEEKLY TRANSACTION LISTING.

Option 6 on the Tools Menu — Automatic Procedures — lets you automate a series of actions which would otherwise be performed by an operator. Thus, you could run an end-of-day report by choosing an option from the Procedures menu, and then leaving the computer to do all the work.

Tools 10 and 11 provide a way for defining complex processing tasks. With the Transaction Definitions Tool you can describe the way data captured in a transaction affects data elsewhere in the system, while Tool 11 lets you define and automate processing which occurs at regular intervals, including all the file updates and reports to be produced. Once again, all this is accomplished through choosing the appropriate menu options and responding to System Builder's prompts; to be able to give the correct responses, you need detailed knowledge of your processing requirements.

Tool 12 lets you create shorthand commands which accomplish a series of menu selections and processing, which can then be accessed from anywhere in the system. Say you're entering some transaction details about a customer in the TRANSACTION DATA ENTRY screen, and you find the customer is not yet recorded on the Customer Master file — normally, you'd have to exit the current screen, find the Customer Master Maintenance procedure, run it and enter the new customer, and then return to the transaction file to enter the new details.

However, if you have previously defined a command to add a customer to the masterfile and called it ADDCUST, all you have to do is type /ADDCUST and you'll be immediately transported to the master update routine. Once you've finished, you're returned to where you were before. System Builder itself uses a series of these commands for developing applications; you can use the supplied commands, or make your own as required.

The Cross-Reference Field Index lets you define fields, other than the key field, which you can use to retrieve information. This is similar to creating indexes with other database systems, but once again, System Builder provides extra features which make it perform that little bit better.

The final three tools let you: print documentation (automatically generated by System Builder) showing operators how to use your system and providing complete technical documentation for system developers (you can also use this tool to develop sophisticated online tutorials on how to use your system); set up a file which describes the particular hardware you'll be running the application on; and compiling your system so it runs faster.

The Master Builder

This has just been a brief rundown on System Builder's features — it's difficult to do a program as flexible and sophisticated as this justice in a review; you really have to use it to do it justice. While the Tools themselves are extremely powerful, they're only part of what makes this a *great* program. Combined with this power is a consistency which makes System Builder very easy to use and which shows a high degree of attention to detail in its development. This consistency includes the complete system from the development environment to the 'live' systems produced using System Builder, with standard menu choices always provided.

A small example of the consistency is the use of online help: In the development system, you can type a question mark at any time to get a memory jogger of what to do next; a second question mark will bring up more detailed help, anything from a paragraph to pages and pages of information. You can also type an asterisk any time you're prompted to enter a field, file, screen, report, procedure or command

Product Details

Product:	System Builder Version 4.0
From:	Atech System Builder
Distributed by:	SB Tech 500 Oxford St, Bondi Junction 2022 NSW (02) 387 4644
Price:	MS-DOS $1295 taxed Pick $1995 taxed

name, and System Builder will respond with the list of possible choices. You use the same techniques when operating a real application, with the '??' bringing up the help screens you created yourself.

My only complaint about System Builder is the lack of a printed manual. This becomes quite critical at times, because of the high degree of preparation required *before* you start building a system. Just be resigned to the fact that you'll have to waste your time and resources making a printed copy of the online manual.

As mentioned above, it's hard to do System Builder justice in a short article; if what I've described sounds interesting, my advice is to contact the local distributor who'll be more glad to show you the System in action.

Especially for applications with a major financial component, it's a cut above the competition. □

```
ABC COMPANY
              14:54:42  12 DEC 1986      PAGE: 1

                                        LISTING OF SCREEN : ENQ1     FILE: A
RMASTER

--------------------------------------------------------------------------------
------------------------------------------------

********************************************************************************
*                              ARMASTER ENQUIRY FIRST SCREEN                   *
*                                                                              *
*          1: Account Number          _____                                    *
*          2: Surname                 ____________________                     *
*          3: Address Line 1          ____________________                     *
*          4: Address Line 2          ____________________                     *
*          5: Address Line 3          ____________________                     *
*          6: Zip Code                _______                                  *
*          7: Account Type            _                                        *
*          8: Bus. Phone              ___________                              *
*          9: Branch                  __                                       *
*         10: Initials                ___                                      *
*         11: Title                   ____                                     *
*         12: Current                 _________                                *
*         13: 30 Days                 _________                                *
*         14: 60 Days                 _________                                *
*         15: 90 Days                 _________                                *
*         16: Balance                 _________                                *
*                                                                              *
********************************************************************************

    Field Name/Heading          Column  Row   Input   Head Above   Pad  Cont/Dep
 Window
    ARMASTER ENQUIRY FIRST SC    30      1                N         Y
 1: ACNO                         10      3      Y         N         Y
 2: NAME                         10      4      Y         N         Y
 3: ADDR1                        10      5      Y         N         Y
 4: ADDR2                        10      6      Y         N         Y
 5: ADDR3                        10      7      Y         N         Y
 6: ADDR4                        10      8      Y         N         Y
 7: TYPE                         10      9      Y         N         Y
 8: B-PHONE                      10     10      Y         N         Y
 9: BRANCH                       10     11      Y         N         Y
10: INIT                         10     12      Y         N         Y
11: TITLE                        10     13      Y         N         Y
12: BAL-CUR                      10     14      Y         N         Y
13: BAL-30                       10     15      Y         N         Y
14: BAL-60                       10     16      Y         N         Y
15: BAL-90                       10     17      Y         N         Y
16: BAL                          10     18      Y         N         Y
```

Figure 3. *An application screen (top) and its structure (bottom) developed with System Builder.*

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Here Comes Telecom

I WROTE TO TELECOM about the spectre of Bulletin Boards being subject to time charging, as they hinted might happen late last year. I'm still waiting for a reply to my letter (dated January 20) — but, a 'News Release' from Telecom (addressed only to 'Metro Dailies') in late April, hit right at the heart of the Community Based Bulletin Boards.

Before we get into the News Release (and my comments thereon), I can only say that I hope this is just another case of both parties misunderstanding each others point of view. Really paranoid types might get the impression that parts of the Q&A, like the As, are totally faked. (I know the questions are rhetorical, I mean the information in the answers — much of it seems to miss the point of what's happening in the real world out here, away from the bureaucratic confines of Telecom's Head Office.)

The News Release

The release was headed *'Information Society' boom forces re-think on dial-up data calls.* The text follows —

The rapid growth of the 'Information Society' has forced Telecom to introduce a new charging system for dial-up data calls through the public switched telephone network to information system providers.

Dedicated network services manager, David Gannon, said today Telecom planned to bring in the new system based on timing of local data calls by Mid-1988. 'The past few years have witnessed a dramatic rise in the use of the public switched telephone network for data applications. Some of these applications involve maintaining connections through the local network which last for hours, or even days. The information service providers are effectively receiving the benefits of a semi-permanent link for the price of a local call.'

Mr Gannon said Telecom needed to ensure information service providers made a fairer contribution to the maintenance and upgrading of the public switched telephone network. 'Long-hold data traffic cannot reasonably and economically be accommodated on the telephone network. The network has been developed on the basis of carrying voice traffic with the average call duration of less than three minutes.

'It must be recognised that these long data calls impose a high cost on Telecom — one which is being met indirectly by all telephone customers. It should also be recognised that further growth in the number of data calls would restrict Telecom's ability to contain costs and could lead to a general increase in tariffs.'

Mr Gannon added that the new system would not affect charges for voice calls. It would also have no effect on data calls of similar average duration. 'Commencing Mid-1988, exchange access lines rented by information service providers for client access to computer processing, database and other bureau services will be metered for usage. The calling client will pay only the initial meter registration of 18 cents, and the information service provider will be charged for any excess holding time.'

Questions and answers for introduction of new charging system for dial-up data calls —

Q. Why has Telecom drawn-up a new charging system for dial-up data calls?
A. Telecom has decided to bring in the new system after a review of the rapid growth in the information society and its impact on the use of the public telephone network. It was found that commercial operators were using the ordinary telephone network for extensive data transfer. In some instances, this has resulted in local telephone lines being tied-up for hours, or even days for the price of a local call (18 cents).

Q. Is the new approach fair?
A. Yes. The cost to Telecom is currently being met by all telephone customers, regardless of whether or not they use dial-up data services. They will no longer subsidise the operations of information service providers who are operating commercially and relying heavily on a currently underpriced telecommunications facility as a factor of production.
(I do not think anyone could argue with this. Commercial organisations doing this are acting in a immorally, I feel.)

Q. How will the new system operate?
A. The calling client will pay just a local call fee — as happens now. The cost for extra holding time will be met by the information service provider. Exchange access lines rented by information service providers for client access to computer processing, database and other bureau services will be metered for usage.
(I agree, Commercial (read: money making) services should pay for the right to use the Public Switched Telephone Network.)

Q. When will the new system be introduced?
A. The new charging arrangements will progressively come into effect from around June 1988. We're announcing them now to give companies adequate time to plan and develop their data communications requirements.

Q. Won't it discriminate against users of dial-up data service providers?
A. No. They will continue to pay only a local call fee. Any remaining charges for excess holding time will be met by information service providers. Any changes in level of service provided are by commercial information service providers — not Telecom.
(Well come on, a commercial institution is not going to absorb this cost. The access charges for these systems will rise.)

Q. Is the introduction of timed local data calls related to timed local calls for voice?
A No. The two are totally unrelated.
(Imagine the public outcry that time charging would cause!)

Q. How will the new charging system affect hobbyists?
A. Some electronic billboard operators have indicated to Telecom this will aid them in managing their calling queues and allow more efficient and wider access to their services. Some of these operators have suggested that at the moment their lines are being congested from enthusiastic hobbyists.
(WOW! Just to point out how out of contact Telecom is — we are called Bulletin Boards and have been so-called every place in the world since Ward Christensen set up the first, 20 years ago. To top it off, no sysop could agree with the rest of the statement; it's at complete variance with the purpose of Bulletin Boards! Who on earth did they speak to? Certainly not to any of the hundred of sysops in the National PAMS List!)

Q. How can Telecom distinguish voice calls from data calls for timing purposes?
A. Telecom does not have to — and it would be very difficult anyway. The information service providers will nominate to Telecom the exchange lines on which they receive their client calls. It will be a matter for the service providers to separate out their administrative voice traffic from their dial-up data call traffic. Most of them already do this for their own purposes.

Q. What type of information service providers will be affected?
A Computer service bureaus, electronic billboard operators are some, as well as value added service providers. For example, a typical value added service is a videotex service provider.

Comments

Now, I don't think any fair minded person could argue against Telecom stopping commercial organisations misusing the telephone network. Telecom is trying to stop profit-making companies using the Public Switched Telephone Network to run what are, in effect, satellite offices on their computer systems (for example, a branch in Parramatta rings the head office computer and keeps the line open from Monday morning to Friday night, all for 18 cents).

I seriously question Telecom about this three minute local call rubbish — have you ever rung a Telecom Business Office, for example, and managed even to be connected to the person you wanted in under three minutes? I find that even a fairly trivial call lasts about ten minutes and if I am having a real talk it is usually about half an hour (or more).

One method that could solve most of the problems would be for telephones to drop

out (hangup) after, say, an hour. This way data traffic and voice callers would have more than enough time for any reasonable 'conversation.' Then we would not need another set of rules for every one to worry about. I know this does not solve the commercial user problem, but it would stop the multi-hour and days-at-a-time callers in their tracks.

Commercial users should be charged — other commercial institutions have to pay for data lines so why let some immoral users get away with cheap use of the voice network. Better still, force fixed point-to-point users to connect dedicated lines.

Now the Bulletin Board community — I know of no BBS that allows people to use their system for more than an hour without giving them the big kick. So, how about we be really wild here and say that the BBS systems can be exempt from the charging so long as they set their logon time at a maximum of one hour. I know this is probably too high from Telecom's point of view, but it will exclude the commercial systems who want their users on for as long as possible (so they can charge them hourly fees).

Another point, in the release it is mentioned that all calls on the nominated line would be subject to the tariff. What about part time Bulletin Boards? The poor person would be charged for voice calls that are not in the BBS running times. How about the outgoing calls, the Bulletin Board may call another board to get some messages, do both ends get the time charge then?

Just as a closing note, if time charging is applied against Bulletin Boards, all you users out there can say good-bye to almost all the systems running now, we cannot pay this charge (it would cost me more than I earn!) I do not think this is what Telecom wants, it is just that in closing a loophole in their system they are affecting systems that are not the cause of the problem. I just hope the administrators at Telecom see BBS for the important community resource they are and exempt them from the time charging. □

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MULTI PLAN	•	•	•	•
INFORMIX relational database	•	•	•	•
FOX BASE (D Base II workalike)	•	•	•	•
FOX BASE plus (D Base III workalike)		•	•	•
FOX BASE RUN TIME		•	•	•
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SCO XENIX 386 TOOL KIT		•	•	•
SCO XENIX NET		•	•	•
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WORDS, WORDS, WORDS

WORDS WORDS WORDS WORDS WORDS

— WordStar Release 4

Keith Mackay continues his series on the recent releases of wordprocessing packages with a close look at Release 4 of the perennial favourite — WordStar, replete with thesaurus, undo, spell-checker, and bells (almost).

UNLIKE THE STRANGELY named WordStar 2000, WordStar 4 remains entirely within the framework of the program known to countless users, and loved by many (myself included). Commands are unchanged, with a very few exceptions, and files written under earlier releases of WordStar are completely legible to WordStar 4 and vice versa. (This article was switched back and forth between 3.4 and 4 a number of times with no problems.)

The new release requires a minimum of 256K of RAM, since far less use is made of overlay files — WordStar has at last shaken free of its CP/M heritage. A hard disk, or a high density floppy drive, is preferable for exploiting the program to the full.

Over 125 enhancements have been incorporated according to the 'literature' which accompanied the review copy. These include, selecting a few at random —

Macros
Undo
Path support
Thesaurus
Line and box drawing
Spell check a single word
Remaining disk space display
Text reformatted with search-and-replace
File protection
Multi-line headers and footers

Rumour had it that multiple document editing would be supported — unfortunately, it's not.

The package includes a tutorial disk, which goes little beyond the basics and, like Microsoft's Word tutorials, takes it for granted that the user has a room-temperature IQ and severe myopia. There is no good reason for tutorials to condescend in this manner — unfamiliarity with computers or word processors does not mean the user is an idiot.

The review copy was a pre-release test version — shortcomings I mention here should be considered with that fact in mind. I cannot comment on the documentation: the 'literature' with the review copy was a draft of parts of the manual.

Installation

In addition to an improved version of the facility, WordStar 4 has a new feature, WSCHANGE, which lets the defaults be modified much more easily than before. Although WSCHANGE isn't cursed with the irritating requests for confirmation (see my WordStar Release 3 review in the May issue), it does require the user to twice specify the file to be changed and its drive — which is something of an annoyance, since I would have thought the program would know where its *own* files are. Nonetheless, the WSCHANGE feature is a considerable improvement over the earlier installation program, being far more extensive in its options and also giving help for each selection.

One of its more spectacular features is that it allows redefinition of the function keys not only alone but also in conjunction with the Alt, Shift and Control Keys. This gives forty possible macros — in WordStar 3 this was only possible if you used the DOS DEBUG utility to tinker with the source code. The maximum permissible definition is 30 characters, whereas the old limit was 6. The old WordStar installation program made no compromise whatsoever with the user — function keys could only be redefined in ASCII code (which does not form part of the cultural baggage of most people.) WordStar 4, however, allows redefinitions to be entered as they would be in editing mode.

I was gratified to discover that a number of the default definitions match the commands I have assigned to the function keys in WordStar 3. Ctrl-F2, for example, gives ^QA (search-and-replace, which I still prefer as my own definition on the F6 key — it's used too frequently used to require more than one keystroke). The default definitions of the Alt-Function key combinations allow boxes to be drawn on the screen, which is a useful addition. WSCHANGE also permits defaults to be established for screen colours, logged drive, printer configurations, help level, margins and tabs, page length and so on. Of particular interest is the option of loading WordStar as memory resident, which speeds the program up considerably and frees a floppy drive, although no help messages are displayed in this mode. This is one of the most welcome enhancements to WordStar.

The Thesaurus

Word Finder, the new thesaurus, requires separate installation, and is a splendid example of software-house paranoia, albeit not on MicroPro's part — the thesaurus is under license from a body known as Microlytics Inc. The installation procedure requires the user to enter a name and address for registration and delivers a homily on the subject of software piracy. I

Words, Words, Words
Keith Mackay reviewed Micropro's WordStar Release 3 and Microsoft's Word 3.1 in our May issue. Next, he looks at Micropro's Easy and Software Publishing Corporation's PFS:Professional Write. □

have no tolerance for this sort of thing — to treat the user as a potential criminal is insulting, to say the least. We all know it's dreadfully naughty, and if we're going to do it we're not likely to put off by an appeal to our higher selves.

Having delivered that brief burst of righteous indignation, I will acknowledge that the thesaurus is a useful feature — any word may be checked by pressing Alt-I (or any other combination defined during installation), which displays a window with the word's synonyms. Any of these may be checked for further synonyms or chosen to replace the word in the text. Unfortunately, the paragraph is not automatically reformatted, as it is in spelling correction. A package fully integrated with WordStar would have been preferable — the thesaurus looks and behaves rather like an afterthought. On a twin floppy system with WordStar memory resident, the thesaurus can be in drive A:, since the program disk is no longer required.

The Opening Menu

Those already used to WordStar will find a number of changes in WordStar 4's opening menu. In addition to having been tidied up somewhat, the menu has a number of new options: I for index; T for table of contents; C for protect; M for merge-print and Esc for Shorthand. These are largely self-explanatory with the exception of Esc — this is one of WordStar's potentially most useful new features, a macro facility, to which I shall return later. Display defaults can be changed with WSCHANGE, or the display parameters can be changed temporarily from the opening menu.

The new release requires a minimum of 256K of RAM, since far less use is made of overlay files — WordStar has at last shaken free of its CP/M heritage.

An excellent addition to the file display is the use of wild cards to display, for example, all files with the extension .DOC. Wild cards can also be used to delete files, but not, curiously, to rename or copy them — the latter would have been useful in making back-up disks. The file directory now shows file length, and files can be selected by moving the arrow keys rather than typing their names. Subdirectories are also recognised — the failure of earlier versions of WordStar to recognise subdirectories was a source of annoyance to hard disk users. Another improvement to the opening menu is ?, which will show how much RAM is being used by WordStar and how it is allocated. The documentation did not reveal whether WordStar 4 would support a mouse, but the people at WordStar Australia thought it probably would.

Editing

Entering document edit mode, using D, as before, the screen display is much the same as that of earlier versions, although the function key definitions, both shifted and unshifted, are now shown at the foot of the screen. The page break and its dotted line can't be suppressed in Release 4 — earlier versions used ^OP, but that's been assigned a different function. This is slightly irritating since the status line, ruler line and function key line can all be disabled, leaving the screen with a full 25 lines of text — except for that dotted line. Earlier versions of WordStar repeat the last six lines of the screen when it's scrolled, this one repeats only the last three (for which dispensation I am most grateful).

Cursor movement appears to have been speeded up. Although scrolling is claimed to be faster also, even with the program memory resident, it seemed slightly slower on both machines I tried it on. Moving from the top of a text to the bottom remains as sluggish as ever unless the program is memory resident, in which case it is instantaneous. Saving and loading files has also speeded up quite considerably.

The edit menu offers the same features as earlier releases with a number of additions and enhancements. For example, the backspace key now deletes by default and an Undo command — the old ^U revamped — has been incorporated, allowing the last erasure to be rescinded. This command operates on character, word, line, or block, where a block may be an entire file.

The Undo command offers another possibility: if a block is erased, the Undo command will allow it to be placed elsewhere, which is a more elegant way of block moving than the older approach. I was unable, perhaps by reason of stupidity, to modify the colour of the block, which was displayed in reverse video — I use a monochrome amber screen on which reverse video is blinding, and I would have preferred to select the same darker tones as I established for the menus (green on my monitor gives a rather fetching shade of orange).

The most significant change to the editing menu is the so-called 'Shorthand' feature, which permits definition of macros for text, commands or text-command combinations. Memory dedicated to this purpose is set with WSCHANGE (up to a maximum of 50K). The Esc key brings up a menu offering the options of displaying or changing the macros defined, writing the time and the date and performing various functions from the new maths facility.

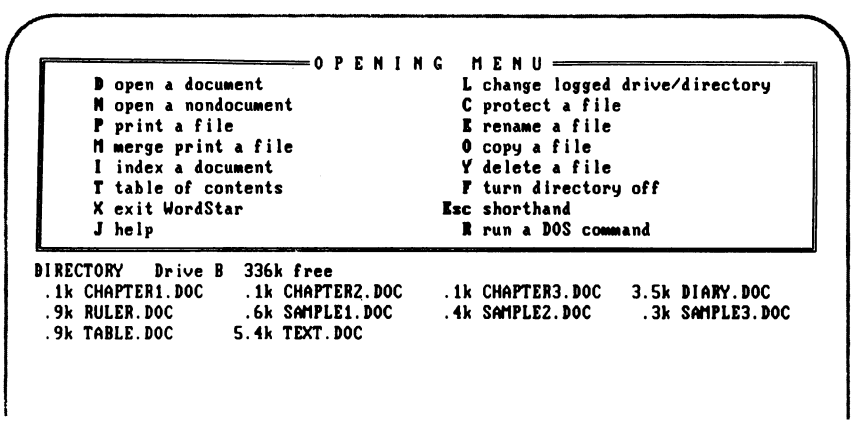

Figure 1. *WordStar 4's opening menu with its new options for index, table of contents, protect, merge-print and 'shorthand,' the new macro facility.*

portion of text is always associated with the margins and tabs set. .LM and .RM respectively change left and right margins on screen and in printing. .UL allows continuous underlining, rather than the unattractive single word underlining of earlier versions.

There is no outline processor, which is not a deficiency in my own view.

WordStar 4 should be available by the time you read this. Upgrades will be available at $169 to WordStar users. Extras available include specialised dictionaries, such as medical, legal and financial. A dictionary recognising British orthography is expected also, although extensive re-education of Americans would be preferable. Wordstar Australia tell me that WordStar 3 will continue to be available, although probably only in its fully-featured form, WordStar Professional, which strikes me as a bad marketing move — as I suggested in my review in May, one of the strengths of WordStar 3 is its modular form.

I have been using WordStar daily in one or another of its manifestations, under both CP/M and MS-DOS, for some years, and although I have long been aware of its defects, there seemed on balance to be fewer of them than in other word processors and the program's great elegance, transparency and flexibility always lured me back from lesser products. Certainly, in release 4, Micropro has rectified a number of shortcomings, and a number of very useful enhancements have been included.

Making the program memory-resident is a major step forward; the screen display makes more efficient use of the space available and the menus are tidier; the Undo command is long overdue; and the realignment of text after search-and-replace is a great time saver. Path support is another very welcome improvement, as are display of file length in the opening menu and the use of wildcards, although it is hard to see why this feature has been circumscribed as mentioned.

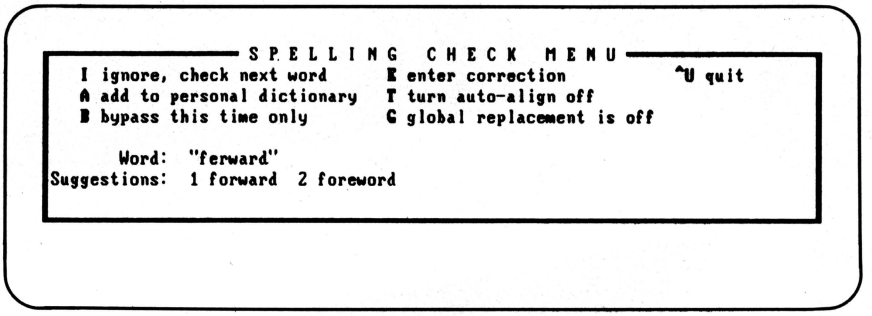

Figure 4. *WordStar's new builtin spelling checker can check the spelling before the word is typed into a document, or it can check a single word, the entire file, or part of it.*

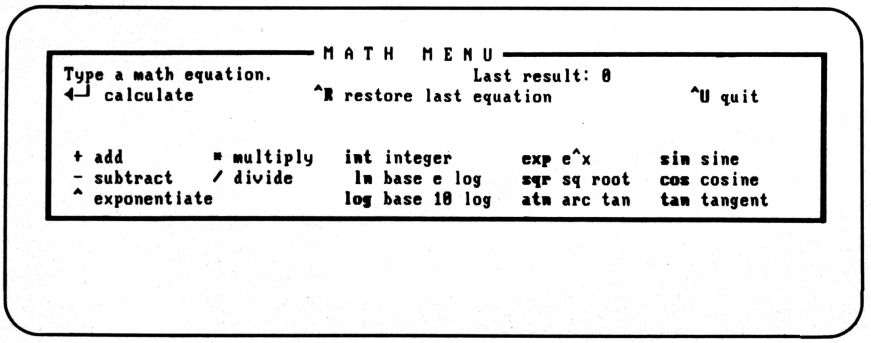

Figure 3. *The Math menu, accessed from the Quick menu, is an entirely new WordStar feature.*

I wanted to like the new release, and indeed I do — but not as much as I expected to. On the whole, I am sympathetically disappointed. Perhaps I am hard to please, perhaps I have for too long been adding to my wish-list for a major new release of WordStar, but the improvements do not seem to me to go far enough. While WordStar 4 is without doubt vastly superior to WordStar 3, and while WordStar users will be pleased with the new features, a little more work will need to be done on release 4.1 if it is to compete with the newer fully-featured programs like Word Perfect 4.1 or Microsoft Word 3.

There is no danger of my deserting the cause — I remain convinced that WordStar is the most flexible word processor on the market and I shall stick with it in the hope that the next release will be better still. But unfortunately, I cannot see many first-time buyers preferring WordStar 4 to the competition. And because I think WordStar is an excellent product, I am rather irritated that Micropro did not do a better job of the new release. □

Product Details

Product	WordStar Release 4
From:	Micropro International Corp, San Rafael, California
Distributor	WordStar Australia Suite 44, Chatswood Village, Chatswood 2067 NSW (02) 411 7255
Price:	$575 untaxed $169 as upgrade

RIP'S *Poems* XVI

I don't approve of throwing people in slammers,
except in the case of certain programmers.
Their documentation is non-existent,
their data names are short and inconsistent,
their logic is twisted and elliptic,
their comments are few — and cryptic,
and in a dialect abstruse and arcane,
they write every program I have to maintain.

— RLP

Nakajima Daisywheel Printer

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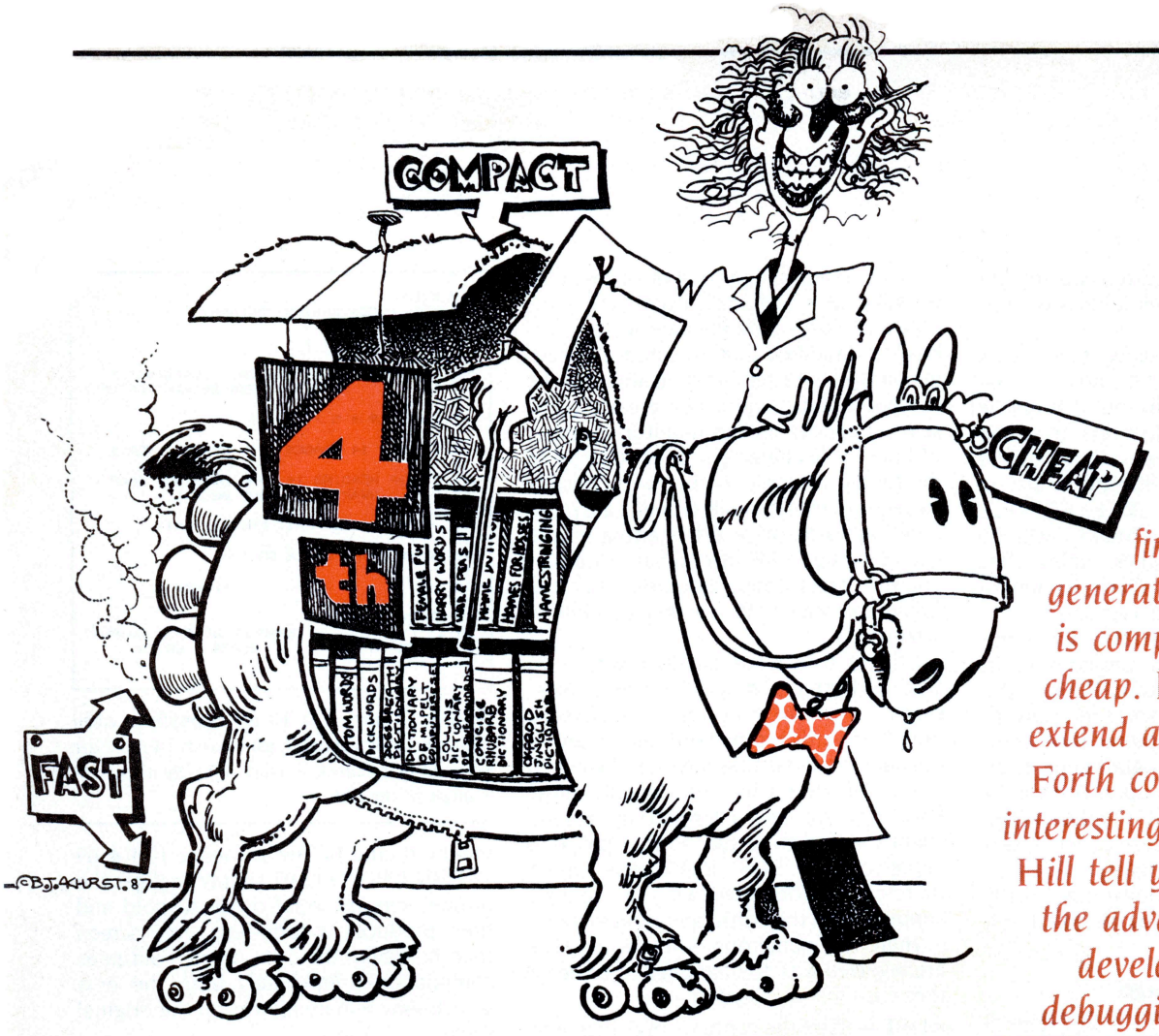


Forth, the first of the fourth generation languages, is compact, fast and cheap. Plus, you can extend and modify the Forth compiler. Sound interesting? Then let Roy Hill tell you more about the advantages as he develops a Forth debugging utility . . .

Come Forth — Part 2

IN PART I OF this introduction to the enigmatic language Forth, I promised to explain why programmers choose to use Forth as their development language, rather than another language. To be fair, I'll also include the objections of those who don't use it. But, first, the advantages of Forth (or, why I use it) —

1) Forth is an exceedingly compact language. It's a fully operative development system that includes an editor and an assembler, as well as a metacompiler (more of that later), but it occupies only 16 Kbytes on my Apple II+ and only 32K on my DATASYSTEM/1 IBM compatible. Compare these sizes with those of conventional C, FORTRAN and Modula-2 compilers and you'll see what I mean when I say Forth is compact.

2) Forth is fast. Boy (should that be 'person'?) is it fast! In most applications, Forth programs operate *at least* 50 per cent (and up to an incredible 90 per cent) as fast as equivalent machine language programs. For an application where timing is really critical, the Forth assembler is always available to permit the compilation of Forth words using assembly language (a Reverse Polish Notation type assembler is a very interesting animal in its own right).

3) Development time for programs is usually much shorter in Forth than in other languages. A Forth utility I wrote to assist with the debugging of programs is a typical (although fairly trivial) example of this. (I'll describe the utility in question later.) Development is more rapid in Forth, because the program can be written in discrete modules and each of these modules (which can be only a single word) can be tested with appropriate data and debugged before going on to the next step.

4) The run-time overheads become very low, because the programmer can strip his final version of Forth down to only those words that are necessary for his application (elimination of the Editor and the Assembler are the usual methods). Thus, the program becomes extremely compact.

5) Because they're in the Public Domain, Forth systems are exceedingly cheap.

The Bad News

The disadvantages of using Forth are few, I find, but they are nonetheless worthy of mention. Forth can either be extremely well written, with extensive comments (both on the coding form and on the source code screens), or extremely poorly written, with absolutely no comments whatsoever. While this is also certainly true of other languages, the user can generally muddle his way through without the comments in these languages, but a badly written Forth program is totally impossible to understand.

A good Forth program (like any other) is liberally sprinkled with comments; I always write a program in the Biblical sense: Comment for others as you would have them comment for you. In order to improve the quality of source documentation, interested parties have developed Forth coding forms (see Figure 2 in Part 1),

which I will be happy to forward for the cost of a stamped, self-addressed envelope.

One of Forth's other disadvantages is its lack of standardisation. I do not consider this a problem personally, but it is one of the most frequent objections to using Forth I hear. Any words developed by the user, unless totally self-explanatory in their definition (LIGHT__FIRE, STRIKE__MATCH, GO__UP__IN__SMOKE) will be totally meaningless to others, unless they are provided with either source documentation, or comprehensive user notes.

The final disadvantage of Forth is the difficulty of learning to program in it. Forth requires a complete re-think of the manner in which programs are conventionally written. Forth requires total commitment to structured programming. Even Niklaus Wirth must look upon Forth a little enviously — after all, Charles Moore didn't have need to release a better version of his structured language under another name. Don't get me wrong, I really do *hate* Pascal and I really do like Forth (*and* Modula-2).

Forth and Mass Storage

The little C—>F program demonstrated in Part 1 has one unfortunate problem — Whenever the computer is turned off, our newly defined words vanish. If we need the words again, we must re-define them. But, all is not lost, because we have at our disposal an 'Editor' and the means for the permanent storage of source code on floppy disk under a layout known as the Forth 'Screen.'

Public Domain Forth

WHEN Charles Moore released his Forth system, he placed it in the Public Domain, thus ensuring the ready availability of an inexpensive system. One of my favourite versions of Forth is a Public Domain one for the Apple II series. I am happy to pass on a copy to any interested reader: Simply send $15 (to cover the cost of handling, copying and the disks) to Forth System, care of *Your Computer*. Documentation and source code are included on the disk. (Cheques or money orders only.)

I also have a Public Domain version for IBM PC's — untested as yet (all care, no responsibility), for the same cost as the Apple version).

With either of these versions, I'll include 'masters' of the Forth coding forms used in Figure 2 of Part 1 which can be copied to give an endless supply. □

Screens are simply blocks of memory, whether RAM or floppy, usually 1K long, on which Forth programs are written, debugged, modified and executed. Depending on the character handling ability of the computer and monitor being used, these screens appear on the monitor as either 24 lines by 40 characters, or as 16 by 64. In the former example, 64 bytes of possible storage are inaccessible. Screens are numbered upwards on a disk, starting from 0 and going up to 140 (for Apples). Computers with larger floppy capacities than the Apple has, can hold a larger number of screens.

Screens 0 to 3 are usually reserved for DOS and screens 4 and 5 for error messages. Some systems also use screens from 5 upwards for the Forth dictionary — I usually consider that anything below 50 is unavailable for use. Incidentally, most Forth systems use a formatting scheme slightly different to the normal program supplied with DOS. Blank disks must therefore be formatted with the routine supplied with the Forth operating system.

There are numerous Forth words that are involved with the handling of screens; these are just a selection —

n LIST — Type the contents of Screen *n* to the console (or to the printer, if it has been selected).

n EDIT — List screen *n* and enter the edit mode, with the cursor positioned at the top left-hand corner of the editing screen. Most Editors make use of the cursor control keys of the host operating system. If a Forth package only contains line editing facilities (rather than screen-based editing as described here), don't touch it. Line-based editors are to screen based editors as Model T's are to LTD's.

n1 n2 COPY — Copy the contents of screen *n1* to screen *n2*. The contents of screen *n1* remain unaltered.

n WIPE — Clear the contents of screen *n* to blanks, prior to editing.

n LOAD — Process the contents of screen *n*. If screen *n* contains any colon definitions, compile them. Compilation ceases and appropriate messages are displayed if errors are encountered during compilation. (In Figure 1, Lines 2 to 13 are examples of colon definitions to be compiled.) If any words on the screen are not contained inside a definition, then execute them, rather than compile them. (Lines 14 to 22 in in the same example are examples of words to be executed rather than compiled.) In Line 14, the sequence 1 PR# 69 27 EMIT EMIT 12 EMIT simply engages the printer, sets the print mode to bold and then produces a form-feed. Any screen that contains the —> word continues compilation immediately onto the next screen. Any remaining text on the original screen is ignored.

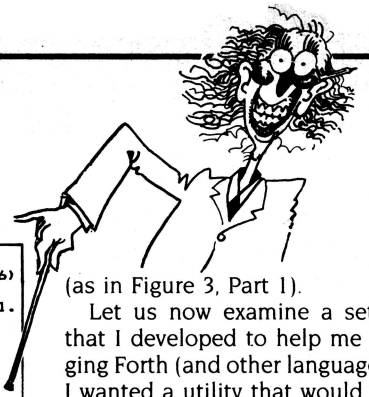
By typing 120 LOAD, followed by a carriage return, the C—>F conversion program is compiled, executed and dumped to the printer, together with the appropriate captions at the bottom of the screen

```
SCR # 120
  0 ( C->F CONVERSION PROGRAM)
  1
  2 : BEEP 7 EMIT ;
  3
  4 : HEADING CR 11 SPACES ." Celsius" 9
  5           SPACES ." Fahrenheit" CR CR ;
  6
  7 : CALC 9 * 5 / 32 + ;
  8
  9 : PRINT 14 SPACES . 15 SPACES . CR ;
 10
 11 : C->F HEADING 1+ SWAP DO I DUP CALC
 12        SWAP PRINT LOOP BEEP ;
 13
 14   1 PR# 69 27 EMIT EMIT 12 EMIT
 15
 16 20 60 C->F  CR CR CR
 17
 18 ."                          Figure 3"
 19
 20 CR CR
 21 ."                EXAMPLE OF C->F OUTPUT"
 22 CR CR                 0 PR#   CR CR
 23
```

Figure 1. *Lines 2 to 13 are examples of colon definitions to be compiled, while Lines 14 to 22 are words to be executed. A more complete discussion is given in the text.*

Figure 2. *A set of Forth screens from a debugging utility. Screen 110 defines the word 0> and the variables that will be needed; screens 111, 112 and 113 define additional words to complete the program. Screen 114 brings it all together and sends the result to the printer.*

```
SCR # 110
  0 ( HEX to ASCII DUMP              R.H. MAY 86)
  1
  2 : 0> 0 > ; ( We need a few extra utility
  3              words prior to the actual
  4              program )
  5
  6 : INVERSE 63 50 C! ;
  7 : NORMAL 255 50 C! ;
  8
  9 : BETWEEN 1+ >R 1- OVER < SWAP R> <
 10           AND ; ( Determines if a value
 11                   on the stack lies
 12                  BETWEEN  the supplied
 13                  two values)
 14
 15 0 VARIABLE UPPER ( Top location)
 16 0 VARIABLE LOWER ( Bottom location )
 17
 18 0 VARIABLE LINES ( Count lines per page
 19                    for output )
 20 0 VARIABLE SUM   ( Checksum counter)
 21
 22 0 VARIABLE LAST  ( uneven number of
 23                    bytes on line )  -->
```



```
SCR # 111
  0 ( HEX to ASCII DUMP          R.H. MAY 86)
  1
  2 : .ASCII ( Print the supplied stack val.
  3            as an ASCII char. - control
  4            codes in inverse)
  5
  6          DUP 0 31 BETWEEN
  7          IF
  8             64 + INVERSE EMIT NORMAL
  9           ELSE DUP 32 126 BETWEEN
 10           IF
 11              128 + EMIT
 12            ELSE DUP 127 159 BETWEEN
 13            IF
 14               DROP 46 EMIT
 15            ELSE DUP 160 254 BETWEEN
 16                 IF EMIT
 17                   ELSE DROP 46 EMIT
 18                 THEN
 19            THEN
 20          THEN
 21          THEN ;
 22
 23                                    -->
SCR # 112
  0 ( HEX to ASCII DUMP          R.H. MAY 86)
  1
  2 : ONE_LINE ( Routine to output a single
  3              full line of hex/ASCII
  4              characters)
  5
  6
  7            16 BASE ! DUP CR U. 45 EMIT
  8            DUP 8 + SWAP OVER OVER
  9            DO
 10               I C@ DUP SUM +! 3 .R
 11            LOOP
 12            2 SPACES
 13            DO
 14               I C@ .ASCII
 15            LOOP
 16            8 LOWER +!
 17            1 LINES +!
 18            LINES @ 60 - 0=
 19            IF
 20               0 LINES ! 12 EMIT
 21            THEN ;
 22
 23                                    -->
SCR # 113
  0 ( HEX to ASCII DUMP          R.H. MAY 86)
  1
  2 : CKSUM ( Prints out the cheksum that
  3           has been accumulating in SUM)
  4
  5         60 SPACES ." Checksum = " SUM @
  6         0 5 D.R ;
  7
  8 : END_BIT ( Prints out any values that
  9             don't quite fit on one line)
 10           LOWER @ DUP CR U. 45 EMIT
 11           UPPER @ SWAP
 12           DO
 13              I C@ DUP SUM +! 3 .R
 14           LOOP
 15           8 LAST @ - 3 * 2 + SPACES
 16           UPPER @ LOWER @
 17           DO
 18              I C@ .ASCII
 19           LOOP
 20           CR ;
 21
 22
 23                                    -->
SCR # 114
  0 ( HEX to ASCII DUMP          R.H. MAY 86)
  1
  2 : HA_DUMP ( Put it all together)
  3           CR CR 0 SUM ! 1+ OVER OVER
  4           UPPER ! LOWER ! SWAP - 8 /MOD
  5           SWAP LAST ! DUP 0>
  6           IF
  7              0
  8                 DO
  9                    ?TERMINAL
 10                    IF
 11                       LEAVE
 12                    THEN
 13                    LOWER @ ONE_LINE
 14                 LOOP
 15              ELSE DROP
 16           THEN LAST @ 0>
 17           IF
 18              END_BIT
 19           THEN CR CR CKSUM CR ;
 20
 21 : PR_DUMP ( Send to Printer)
 22           0 LINES ! 1 PR# HA_DUMP CR 0
 23           PR# ;
```

(as in Figure 3, Part 1).

Let us now examine a set of screens that I developed to help me with debugging Forth (and other language) programs. I wanted a utility that would allow me to examine a block of memory, display the contents in both hexadecimal and ASCII code, and that would perform a checksum (that is, it would total the bytes in the desired block and print the sum). This sort of routine is also invaluable to confirm that an EPROM has been correctly programmed (despite what the software supplied with the EPROM programmer says).

The source screens (110 to 114 inclusive) are shown in Figure 2. Screen 110 contains some words that I knew I would need in the development of this program (0>, for example), which leaves a TRUE flag on the stack if the top stack value is greater than 0. This screen also contains definitions of the variables required by the program (all initialised to 0), together with explanations (Forth uses the () characters to delimit remarks — don't forget the space after the opening bracket and before the first character).

Screen 111 is a definition of the first word required. This is the word responsible for the actual hexadecimal-ASCII output. Notice the liberal use of new lines and indentation to delimit IF . . . ELSE . . . THEN sections of the program. This word also checks the contents of one location to determine if the character is a control code, a printable character or an un-printable character. Un-printable characters are replaced with a period when the ASCII table is printed out and control characters are printed in inverse. Screen 112 introduces a word that prints out one complete line of hexadecimal/ASCII values. Once again, notice the use of new lines and indentation to which are used to delimit IF . . . ELSE . . . THEN statements and DO . . . .LOOP constructs. Forth does not require new lines and indentation — good programming practice does.

Screen 113 defines the word that prints out the checksum value and also a word that handles the printout of any data that doesn't quite fill one line, so that blocks with less than 8 bytes are still printed out neatly. The final screen (114) puts it all together and also provides a special word to allow the contents of the desired block to be dumped to the printer. The variable originally defined as LINES keeps a count of the number of lines printed so that it can tell the printer (or monitor) when a new page is due. Lines 18 to 20 inclusive in screen 112 allow for 60 lines of output per page.

A final feature of Forth that I would like to discuss is that of compiler extensions and modifications. Forth is the only language of which I am aware (other than Forth look-alikes), that allows the very careful user to both modify and extend the compiler. If I wish my version of Forth to support double precision variables and they aren't available as part of the system (they normally aren't), then all I have do is type —

```
: DVARIABLE CREATE , , DOES> ;
```

The word CREATE creates space in the dictionary for a double normal length entry (the function of the two commas), so that after I compile my new word, I can simply say —

```
63541 DVARIABLE bigword
```

and the value 63541 will be stored in the double precision location called bigword. Note the consistent use of upper and lower case letters. Forth itself does not know the word 'create,' nor does it recognise 'dvariable.'

Can you extend your compiler so easily?

It is also possible to re-define and then re-compile existing Forth words, using a programming tool called a 'metacompiler.' This enables the user to re-compile the existing system at a higher memory location, make any necessary modifications to the existing source screens and then re-compile to the original location. I have done this to re-define the two words —> and LOAD, so that they now tell me what screen is currently being loaded by the system.

That concludes my introduction to Forth. I sincerely hope that it provides you with the interest to examine a working version on your system.

May the Forth be with you! □

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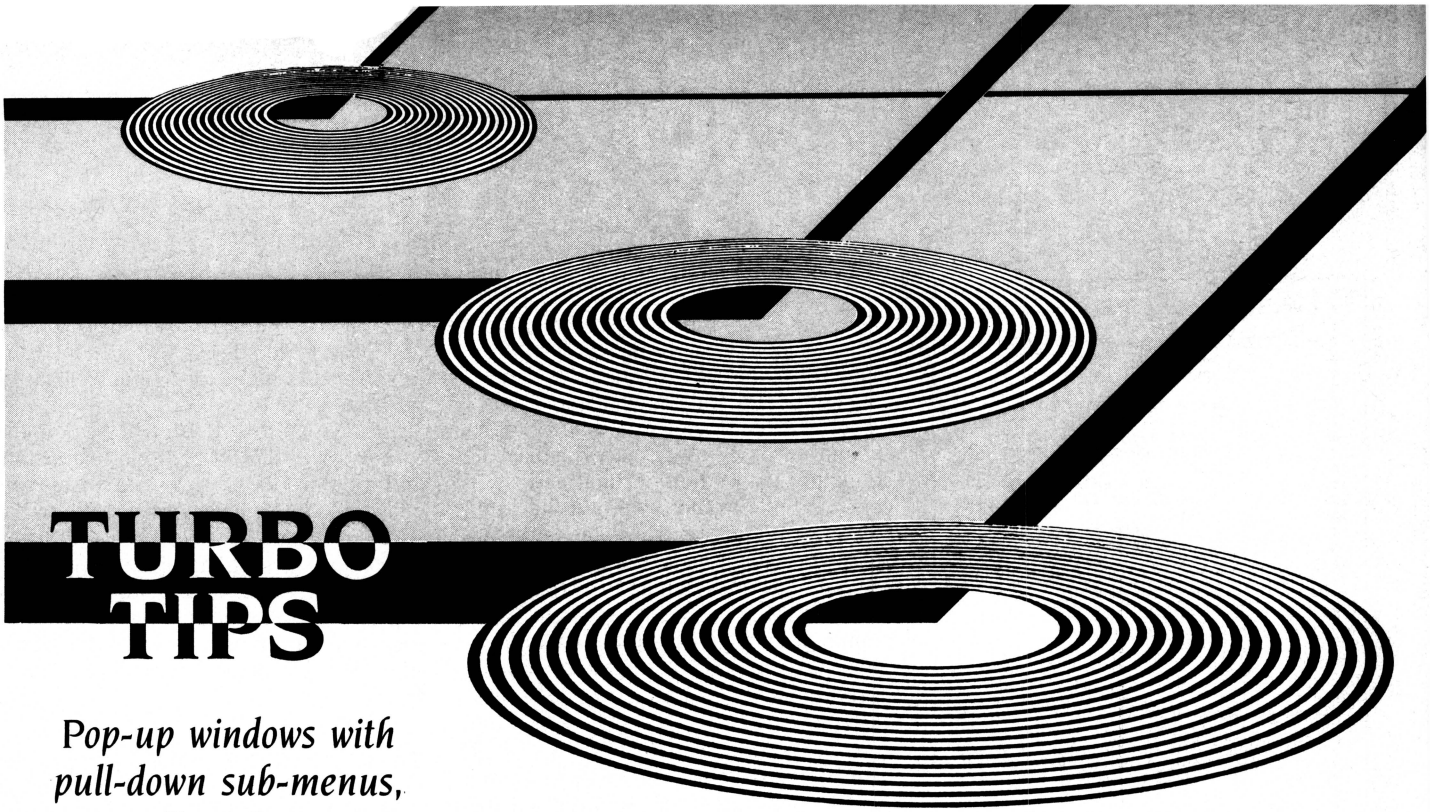

TURBO TIPS

Pop-up windows with pull-down sub-menus, Part 2.

Advice on headers in source files and how to get any character from the keyboard in Turbo Pascal, are the tips from Peter Hill this month. Then, he completes the pop-up windows menu system with pull-down sub-menus.

I USUALLY KEEP a small header in each of my source files; this typically looks something like Listing 1. As well as being good practice, this has no effect on either compilation time or execution time, since the comments are disregarded by the compiler.

Often, however, there is a need for more extensive documentation or operational notes. Since Turbo Pascal compiles *only* until it finds the statement END, there is a simple solution. Any notes, pseudo-code or revision history can be placed after the code statements, and will be saved together with the source code. No comment markers ('{' or '(*') are required, since the compiler will never process this area.

We can also put information here about the structure of the code, which is helpful in larger projects to resolve precedence and forward declaration problems. Listing 2 analyses Pascal source and writes it out to disk. If, after you run the program to analyse, say MYPROG.PAS, with an output file of MYPROG.STR, you then load MYPROG.PAS into the Turbo editor and then append MYPROG.STR after the final END statement, (using Ctrl-KR), you will always have this information at hand.

```
PROGRAM Demo;
{
////////////////////////////////////////////////////////////////
PURPOSE      : Just a demonstration.
COMMENCED    : 12/1/1987
LAST REVISED: 14/1/1987
REVISION     :  Modification  of  Get_Parms  to  accept  multiple
                parameters.
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
}
```

Listing 1. *Program Demo.*

```
PROGRAM TS;
{
show the structure of  a [Turbo] pascal file
Commenced: 1/3/1986
Revised  : 14/1/1987
Revision : General tidy.
}

TYPE
LineStr         =STRING[255];

VAR
i,o             :TEXT[$800];
InName,OutName  :Linetr;
CurrentLine     :LineStr;
LineCount       :INTEGER;
ProcCount       :INTEGER;
FuncCount       :INTEGER;

FUNCTION Strip(DummyString :LineStr):LineStr;
{strip leading blanks fom a line}
BEGIN
     WHILE DummyString[1]=' ' DO
     BEGIN
          DummyString:=Copy(DummyString,2,Length(DummyString)-1);
     END;
     Strip:=DummyString;
END;

FUNCTION Exist(DummyString :LineStr):BOOLEAN;
{from the Turbo Pascal manual    determine if a file exists
 by checking IOResult after a reset/close}
```

Listing 2. *Program TS for showing the structure of a Turbo Pascal program.*

```
VAR
fil :FILE;
BEGIN
     {turn off I/O checking}
     {$I-}
     Assign(Fil,DummyString);
     Reset(Fil);
     Close(Fil);
     {switch it back on}
     {$I+}
     {check the Standard Function IOResult}
     IF IOResult=0 THEN Exist:=TRUE ELSE Exist:=FALSE;
END;

FUNCTION UC(DummyString :LineStr):LineStr;
{convert line to upper case}
VAR
CharCount:INTEGER;
BEGIN
     FOR CharCount:=1 TO Length(DummyString) DO
          DummyString[CharCount]:=UpCase(DummyString[CharCount]);
     UC:=DummyString;
END;

PROCEDURE Get_Files;
BEGIN
     ClrScr;
     WriteLn(' TS...Turbo Pascal Programme Structure List to Disk');
     WriteLn;
     LowVideo;
     Write('File Name to Analyze [include extension] ?--->');
     HighVideo;
     ReadLn(InName);
     LowVideo;
     Write('File Name in which to save results       ?--->');
     HighVideo;
     ReadLn(OutName);
END;

PROCEDURE Prepare_Files;
BEGIN
     Assign(i,InName);
     Assign(o,OutName);
     Reset(i);
     Rewrite(o);
     WriteLn(o,'Functions and Procedures in the File ',InName);
     WriteLn(o);
     LineCount:=0;
     ProcCount:=0;
     FuncCount:=0;
END;

PROCEDURE Analyze;
VAR
IncFound:INTEGER;
BEGIN
     ReadLn(i,CurrentLine);
     CurrentLine:=Strip(CurrentLine);
     LineCont:=LineCount+1;
     {every ten lines show some screen activity to reduce panic}
     IF Frac(LineCount/10)=0 THEN Write('.');
     IncFound:=Pos('{$I',CurrentLine);
     IF IncFound<>0 THEN
     {show included files}
     BEGIN
          IF ((CurrentLine[IncFound+3]<>'-') AND
          (CurrentLine[IncFound+3]<>'+')) THEN
               WriteLn(o,CurrentLine);
     END
     ELSE
     {show procedres}
     IF Pos('PROCEDURE',CurrentLine)<>0 THEN
     BEGIN
          ProcCount:=ProcCount+1;
          WriteLn(o,CurrentLine);
     END
     ELSE
     {and show functions}
     IF Pos('FUNCTION',CurrentLine)<>0 THEN
     BEGIN
          FuncCount:=FuncCount+1;
          WriteLn(o,CurrentLine);
     END;
END;

BEGIN
     Get_Files;
     IF Exist(InName) THEN
     BEGIN
       Prepare_Files;
       WHILE NOT Eof(i) DO Analyze;
       {conclude with some stats}
       WriteLn(o);
       WriteLn(o,'LineCount is ',LineCount);
       WriteLn(o,'FunctionCount is ',FuncCount);
       WriteLn(o,'ProcedureCount is ',ProcCount);
       WriteLn(o,'<<<<<<<<<<<<<<<<<< End of Data >>>>>>>>>>>>>>>>>');
       {bye}
       Close(i);
       Close(o);
     END
     ELSE WriteLn('Cannot Find File :',InName);
END.
```

```
PROGRAM GetChar;

FUNCTION Read_Char_As_String:CHAR;
VAR
IK    :CHAR;
BEGIN
     Write('Type a character then Return');
     ReadLn(IK);
     Read_Char_As_String:=IK;
END;

FUNCTION Read_Char_KeyBoard:CHAR;
VAR
IK    :CHAR;
BEGIN
     Write('Type a character');
     Read(Kbd,IK);
     Read_Char_KeyBoard:=IK;
END;

BEGIN
     WriteLn(Read_Char_As_Strng);
     WriteLn(Read_Char_KeyBoard);
END.
```

Listing 3. *An example of keyboard input by either reading a character as a variable string, or by reading the character directly from the keyboard.*

The Keyboard

We can easily get any character key from the keyboard in Turbo Pascal in one of two ways; either we can read the character as a variable string (with the return key terminating input) or we can read the character directly from the keyboard and react immediately, all using standard Turbo Procedures and Functions. An example of keyboard input using each method is given in Listing 3.

Neither of these methods, however, gives us the intimate access to the keyboard which we require for more sophisticated applications. To handle function keys and the cursor control keypad, we can either use the routine outlined in the Turbo Pascal manual (Appendix N of Version 3.0) or use one of the ROM-BIOS functions. Since the latter is more instruc-

tive and also faster, we will pursue it here (although if you are using a less-than-compatible machine, the former is more portable).

The key to this approach is that when a key is pressed, the result is returned in two bytes. The first is the ASCII code byte. If this is non-zero, then the BIOS returns the character corresponding to this ASCII value. If however, the ASCII byte is zero, then DOS returns the second (SCAN) byte which represents a message equivalent to 'a special key has been pressed and its assigned number is n.' In other words, for the special keys, a table of assignments exists which strongly resembles the ASCII table. These assignments are given in Table 1.

KEY	n
The Function Keys	
F1..F10	59..68
Shift F1..F10	84..93
Alt F1..F10	104..113
Ctrl F1..F10	94..103
The cursor pad	
Home	71
Up Arrow	72
Pg Up	73
Left Arrow	75
Right Arrow	77
End	79
Down Arrow	80
Pg Dn	81
Ctrl Home	119
Ctrl Pg Up	132
Ctrl Left Arrow	115
Ctrl Right Arrow	116
Ctrl End	117
Ctrl Pg Dn	118
The Alt Keys	
Alt 1..Alt = (top row)	120..131
Alt Q..Alt P	16..25
Alt A..Alt L	30..38
Alt Z..Alt M	44..50
Odds and Sods	
Back Tab (shifted tab)	15
Ins	82
Del	83
Ctrl PrtScr	114

Table 1. *Table of assignments for the Turbo Pascal 'special keys' — refer to the text for explanation (and 'footnotes').*

A table like *that* deserves some footnotes, so . . .

1) If you think it is a rather arbitrary way to assign the codes, write to IBM, not to me;

2) Num Lock, Scroll Lock and Caps Lock are excluded because they are not returned through this mechanism, but through a change in a memory location;

3) The two shift keys, the two plus and minus signs, the numeric keypad and the two asterisks on the standard IBM keyboard are different (as you will discover if you use either Framework or Flight Simulator), but we won't get that deeply into the keyboard; and,

4) The new IBM keyboard has additional function keys F11 and F12, the codes for which are 133 and 134 respectively.

The ROM-BIOS provides an interrupt for getting both the ASCII byte and the SCAN byte from the keyboard. This is interrupt 22, (Hex 16), and the code in Listing 4 shows the method by which we can access this interrupt and return the required data to the application.

Now we have a much more intimate degree of access to the keyboard, and we can commence to assign functions to keys as we see fit; putting this together with the following section on pop-up windows, we could, for example write an online help system which pops-up in its own window when the F1 key is pressed or, as I will present next month, write a menu system which resembles the Framework/dBase III Plus menu, which in turn is a derivative of the Lotus 1-2-3 menu system.

The Key to Windows — Part 2

In April's 'Turbo Tips,' I discussed Windows and low-level access to the keyboard of the IBM PC. This month I want to build on the Windowing and Keyboard routines presented there to develop a user interface which you can integrate in your programs.

Essentially the task of this menu system is to pop up on the screen on demand, present a series of options which you can select by moving the cursor. Having performed the selected task, the menu disappears, leaving the screen as it was originally.

```
{
////////////////////////////////////////////////////////////////

A procedure to report the ASCII code and extended ASCII code of a
keypress on the IBM PC using ROM-BIOS interrupt Hex 16.

////////////////////////////////////////////////////////////////
}
{declare two global variables to hold result}
VAR
ScanByte,
ASCIIByte :BYTE;

PROCEDURE GetScanCode (VAR al,ah  :BYTE);
   TYPE
        regpack=record
                ax,bx,cx,dx,bp,si,ds,es,flags :INTEGER;
                END;
   VAR
        recpack  :regpack;
   BEGIN
         ah:=$0;
         al:=$0;
         {initialise ax}
         WITH recpack DO
              ax:=ah shl 8 + al;
         {issue interrupt $16}
         Intr ($16,recpack);
         {deduce al,ah from ax
         WITH recpack DO
         BEGIN
              ah:=ax shr 8;
              al:=ax mod 256;
         END;
END;

BEGIN
     ClrScr;
     WriteLn('Press Return to terminate, any other key to see its
     extended codes');
     REPEAT
          GetScanCode(ASCIIByte,ScanByte);
          WriteLn('ASCII  byte  is:',ASCIIByte,'  and  ScanByte
          is:',ScanByte);
     UNTIL ASCIIByte=13;
END.
```

Listing 4. *A procedure to report the* ASCII *code and extended* ASCII *code of a keypress on the* IBM PC *using* ROM-BIOS *interrupt Hex 16.*

Let's look at the various operational elements in a bit more detail —

Getting started: I have used the / key to invoke the menu in the manner of Lotus 1-2-3, but it is a simple matter to change the code such that any other key (including any of the Function keys) can invoke the menu. To alter the selection, change the values of the two elements of the variable 'Invoke' in the subroutine 'Init' to the correct Scan and ASCII values as set out in the April keyboard table. For example, to use the 'Ins' key to invoke the menu, change Invoke[1] to 0 and Invoke[2] to 82.

The Esc key: We want the Esc key to operate in a consistent manner. That is, it should always take us up one level without activating any process; at the top level, it exits the menu without taking any action.

Cursor control: All of the cursor control keys ought to operate in an intuitive manner. I have set up PgUp and Home to have the same function, and likewise End and PgDn perform the same function. I've done this because I find it hard to make an intuitive distinction between the functions of these keys in such a menu, but again this is easy to alter.

The sub-menus: There are a number of possible approaches to developing sub-menus, but I have gone for a simple approach of storing the menu data in a two dimensional array, dimensioned by Width (the *x* co-ordinate of the option) and Depth (the *y* co-ordinate). This sample code is an adequate base on which to build a custom menu system; in fact I have used it to build a special-purpose spreadsheet, with little modification.

First-letter operation: In order to provide a familiar interface for casual system users, it is essential to allow for 'first-letter' operation. That means pressing the first letter of a command ought to give the same effect as pointing to it with the cursor keys and pressing Enter. This has the unfortunate side effect of requiring that the first letter of each command on the menu be unique.

It pays to spend some time when integrating this menu into an application to determine all the proposed menu names in order to make the best selection. A classic dilemma is that if you use 'Find' for the Search function in a word processor, you will have to think of something else for your 'File' functions. (MicroSoft use 'Transfer' in their standard interface, but I just can't get used to it!)

Other functions: It is not necessary that the system *only* operates the menu; I have included a very brief Help sub-routine which is activated at any time by pressing the F1 function key, for illustrative purposes.

Integrating the previous modules: This month's system makes use of the April modules in full. I have used the approach of 'including' them in this month's listings by the two statements {$IWIND.INC} and {$IKBD.INC}. To prepare the April programs for inclusion (assuming that you have already typed them or downloaded them from the *Your Computer* Bulletin Board), take the following steps —

1) start Turbo Pascal; 2) name a Work file WIND.INC; 3) edit this new file; 4) read in the Window routines using the Ctrl-K-R command; 5) delete the main operational code between the final BEGIN and END. statements. This code commences as —

```
BEGIN
        Set_Screen_Address;
        WindowsOpen:=0;
        New_Window(7,1,1,20,10);
    and ends as;
        Read(Kbd,IK);
        Close_Window;
    END.)
```

6) save the resulting file; 7) repeat the same sequence for KBD.INC. In the latter case the section which you wish to delete is the following —

```
BEGIN
    ClrScr;
    WriteLn('Press  Return to terminate, any other  key  to
    see its extended codes');
    REPEAT
        GetScanCode(ASCIIByte,ScanByte);
        WriteLn('ASCII byte is:',ASCIIByte,' and  ScanByte
    is:',ScanByte);
    UNTIL ASCIIByte=13;
END.)
```

Operating the system: By this stage you can operate the system using the dummy menu data provided. When the program is run, it waits until the / key is struck and then places the main (horizontal) menu on the screen. This menu can be navigated with the Left and Right Arrow cursor keys and an option selected either by pressing the Down Arrow or Enter. At this stage a secondary (vertical) menu appears under the selected option. This can also be navigated with the cursor keys or operated by pressing the first character of an option description. At any time during this process the F1 key can be pressed which will summon help.

Integrating the system with your code: You will note that the main block of Listing 6 (the last eight lines) just looks at the key pressed; if it is the invokation key (/) then the menu is shown, otherwise the program terminates. An actual application would require a rather more useful main block, but it needs to be tailored to the task. The fragment in Listing 5 is more the type of main block one would typically see in, say, a text editor.

Other than the menu itself, the Procedure 'Process—Key' would do most of the hard work in this program.

The other tailoring necessary to integrate MENU.PAS falls into two parts: Firstly the menu options found in the nested procedure 'Set—Menu—Data' must be modified to suit the task in hand. Note that there must be at least two sub-options for each main option specified in MENU.PAS. The question of appropriate names is addressed in the section on First-letter operation above.

Secondly, and fundamental to the pur-

```
BEGIN
    {Initialise, amongst other things, ExitSignal to false}
    Initialise;
    Display_Welcome_Screen;
    Handle_Parameters;
    REPEAT
        GetScanCode(ASCIIByte,ScanByte);
        IF InvokeKey THEN
            Show_Menu
        ELSE
            Process_Key;
    {until a Boolean variable is set}
    UNTIL ExitSignal;
    {tidy up and put out the cat}
    Save_And_Exit;
END.
```

Listing 5. *Program fragment showing the type of main block used in, say, a text editor.*

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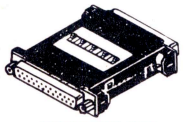

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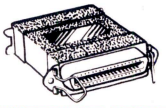

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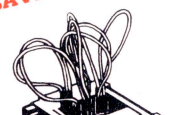

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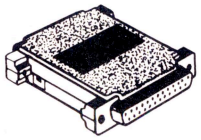

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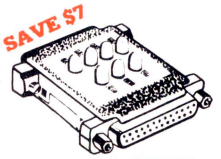

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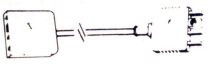

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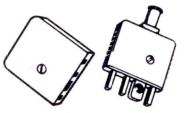

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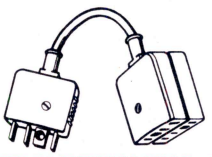

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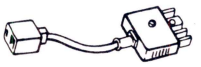
- Length 5 metres.

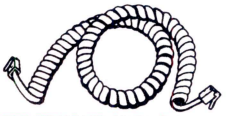
Cat. Y16017 ..... **$7.95**



TELEPHONE ADAPTOR

- Australian plug to U.S. socket
- Length 10cm

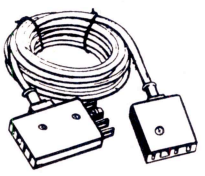
Cat. Y16026 ..... **$5.95**



TELEPHONE CURL CORD

- U.S. plug to U.S. plug
- Replacement hand set cord
- Length 4.5 metres

Cat. Y16023 ..... **$6.95**



TELECOMMUNICATIONS AUSTRALIAN STYLE ADAPTOR CABLE

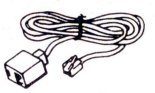
- Australian socket to plug/socket
- Length 10 metres

Cat. Y16015 ..... **$14.95**

TELEPHONE EXTENSION CABLE UNIT

Allows 15 metres of telephone extension cable to be neatly wound into a protable storage container. The reel sits on a flat base and has a handle to wind cable back on to it after use. No tangles - no mess! Ideal for the workshop, around the house, office, pool etc

Cat. Y16013 ..... **$22.95**



U.S. TELEPHONE EXTENSION CABLE

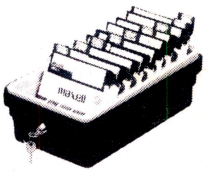
- U.S. plug to U.S. socket
- Length 10 metres

Cat. Y16024 ..... **$7.95**

U.S. TELEPHONE EXTENSION CABLE

- U.S. plug to 2 U.S. sockets
- Length 10 metres

Cat. Y16028 ..... **$9.95**



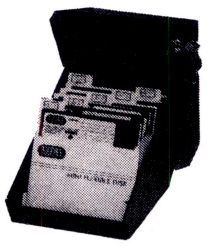
JUMBO 5¼" DISK STORAGE

If you've got lots disks, you'll appreciate the extra capacity of this disk storage unit when it comes to locating "that" disk!

Features...

- 100 disk capacity
- Smoked plastic cover
- Lockable (2 keys supplied)
- 9 Dividers/spacers

C16020 ..... **only $24.95**
C16027 (Hinged Lid) **$26.95**



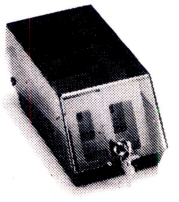
5¼" DISK STORAGE

Efficient and practical. Protect your disks from being damaged or lost!

Features...

- 70 disk capacity
- Smoked plastic cover
- Lockable (2 keys supplied)
- Dividers/spacers

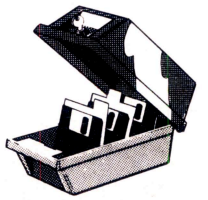
Cat. C16025 ..... **only $19.95**



3½" DISK STORAGE UNIT

- Holds up to 40 x 3½" diskettes.
- Lockable (2 keys supplied)
- High impact plastic lid and base
- Anti static

Cat. C16040 ..... **only $19.95**



3½" DISK STORAGE UNIT

- Holds up to 40 x 3½" diskettes.
- Lockable (2 keys supplied)
- High impact plastic lid and base

Cat. C16035 ..... **only $19.95**

2 & 4 WAY RS232 DATA TRANSFER SWITCHES

If you have two or four compatible devices that need to share a third or fifth, then these inexpensive data transfer switches will save you the time and hassle of constantly changing cables and leads around.

- No power required
- Speed and code transparent
- Two/Four position rotary switch on front panel
- Three/Five interface connections on rear panel
- Switch comes standard with female connector

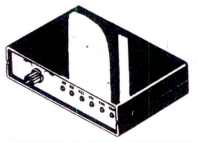
2 WAY Cat.X19120 **$125 $95**
4 WAY Cat.X19125 **$145 $119**

2 & 4 WAY CENTRONICS DATA TRANSFER SWITCHES

Save time and hassles of constantly changing cables and leads around with these inexpensive data transfer switches. These data switches support the 36 pin centronic interface used by Centronics, Printronics, Data Products, Epson, Micronics, Star, and many other printer manufacturers.

- No power required
- Speed and code transparent
- Two/Four position rotary switch on front panel
- Three/Five interface connections on rear panel
- Switch comes standard with female connector
- Bale locks are standard

2 WAY Cat.X19130 **$125 $95**
4 WAY Cat.X19135 **$145 $119**



RS232 DATA SWITCH WITH TESTER

- No power required
- Ideal for 1 computer to 2 peripherals or 2 computers to one peripheral.
- 25 pin RS232 "D" connectors.
- Six dual coloured LED indicators showing certain flow status:

T.D. Transmit Data
R.D. Receive Data
R.T.S. Request To Send
C.T.S. Slear To Send
D.S.R. Data Set Ready
D.T.R. Data Terminal Ready

- Size: 200(W) x 68(H) x 150(D)mm

Cat.X19110 ..... **R.R.P. $169**
Our Price $149

SAVE

SEMICONDUCTORS!

Always check our prices before you buy!

	1-9	10+	100+
2716	$9.95	$9.50	$8.95
2732	$8.95	$8.50	$7.95
2764	$7.95	$7.50	$6.95
27128	$6.95	$6.50	$6.25
27256	$11.50	$10.50	$10.00
27512	$19.50	$18.50	$17.50
4116	$3.95	$3.50	$2.95
4164	$2.25	$1.95	$1.75
41256	$4.95	$4.50	$3.95
555 8pin	$0.50	$0.40	$0.35
6116	$3.95	$3.75	$3.50
6264	$6.50	$6.00	$5.75
6802	$5.00	$4.00	$3.75
6821	$2.00	$1.80	$1.70
6845	$5.00	$4.00	$3.75
7406	$0.40	$0.30	$0.25
INS8250	$29.95	$27.95	

NE5534AN

SCOOP PURCHASE!!!

1-9	10+	100+
$1.95	$1.85	$1.75

WORLD MODEM CHIP

Cat. U21614 ..... Normally $49.50
Save $25, SPECIAL $24.95

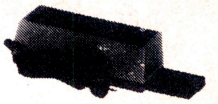
MEL9501

Have you blown up your Apple drive by plugging it in backwards or not turning off the power while changing boards? We have the MEL9501 chip!
SPECIAL, ONLY $29.95

8087

Genuine Intel chips with manual and data sheets packed in boxes!

8087-3 (4.77MHz) **$269**
8087-2 (8MHz) **$385**
8087-1 (10MHz) **$585**
80287-3 (6MHz) **$475**
80287-7 (8MHz) **$679**



UV EPROM ERASER

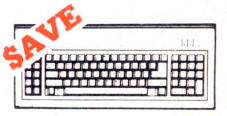
Erase your EPROMs quickly and safely. This unit is the cost effective solution to your problems. It will erase up to 9 x 24 pin devices in complete safety, in about 40 minutes (less for less chips).
Features include:

- Chip drawer has conductive foam pad
- Mains powered
- High UV intensity at chip surface ensures EPROMs are thoroughly erased
- Engineered to prevent UV exposure
- Dimensions 217 x 80 x 68mm

WITHOUT TIMER
Cat. X14950 ..... **Normally $119**
Special, $89

WITH BUILT-IN TIMER
Cat. X14955 ..... **$139**
Special, $119

SAVE



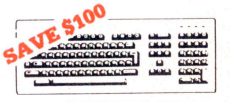
"IBM* AT COMPATIBLE" KEYBOARD

- 100% IBM* PC, XT compatible
- Low profile keyboard design
- Proper placement of shift keys with large key tops to suit professional typists.
- 3 step height/angle adjustment
- Cherry brand TS-M00001 19mm low profile switches, meet 30mm ergonomic requirement and provides high performance and maximum reliability.
- Curl lead plugs straight into PC/XT
- 3 Status displays

Just like the "Real McCoy" only at a fraction of the price!

Cat.X12020 ..... **only $129**

SAVE $100

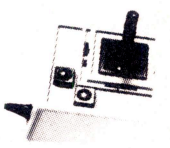


IBM* XT & AT COMPATIBLE EXTENDED KEYBOARD (105 KEYS)

These new keyboards are both XT and AT compatible!

- 20 Dedicated function keys
- Enlarged "Return" and "Shift" key
- Positive feel keys
- Low Profile Design, DIN standard
- Separate Numeric and Cursor control keypads
- Additional Funtions... Key-in-lock, Audio Beep, Previous Word, Next Work, Fast Repeat, Line Feed, Pause, Clear Screen, Reset.

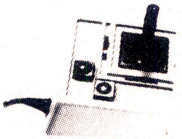
Cat.X12022 ..... **WAS $299**
SPECIAL, ONLY $199



APPLE* II SERIES COMPATIBLE JOYSTICK

These joysticks have adaptor connectors to suit the Apple II, IIc, IIe and II+ computers. Features include selectable "spring centring" or "free floating". Electrical trim adjustments on both axis, 360° cursor control and dual fire buttons

Cat. C14201 ..... **$49.95**



JOYSTICK FOR IBM

Features Selectable "Spring centering" or "free floating". Electrical trim adjustments on both axis. 360 degree cursor control

Cat. C14205 ..... **$49.95**

IBM* XT COMPATIBLE CARDS

NEW! NEW! NEW! NEW!

20M/BYTE HARD DISK CARD
XT compatible, simply plugs straight in to your computer!
Cat. $1,295

Colour Graphics Card
Cat. X18002 ..... $129

Graphics Card (Hercules compatible)
Cat. X18003 ..... $165

Floppy Disk Drive Controller Card
(2 Drives, 16 Bit)
Cat. X18005 ..... $59

Floppy Disk Drive Controller Card
(4 Drives, 16 Bit)
Cat. X18006 ..... $65

High Resolution Mono Card
Cat. X18007 ..... $199

Colour Graphics & Printer Card
Cat. X18010 ..... $149

768kB RAM Card (without memory)
Cat. X18012 ..... $89

Printer Card
Cat. X18017 ..... $34.95

Game I/O Card
Cat. X18019 ..... $37.95

XT Motherboard (without memory)
Cat. X18020 ..... $225

Clock Card
Cat. X18024 ..... $57.50

RS232 Card (without cable)
Cat. X18026 ..... $59.50

RS232 & Clock Card
Cat. X18028 ..... $95

XT Turbo Motherboard
(without memory)
Cat. X18030 ..... $275

Multi I/O & Disk Controller Card
Cat. X18040 ..... $179

I/O Plus Card
Cat. X18045 ..... $129

768K Multifunction I/O Card
(includes cable but not 41256 RAM)
Cat. X18050 ..... $199

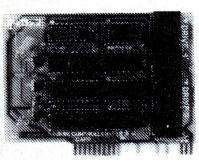
Hard Disk Controller Card
Cat. X18060 ..... $195

Enhanced Graphics Adaptor Card
256K RAM on board
Cat. X18070 ..... $375

64K Printer Buffer Card
Cat. X180?? $139

(AT COMPATIBLE)

Enhanced Graphics Adaptor Card
(Award Bios)
Cat. X $495



APPLE* COMPATIBLE CARDS

PRINTER CARD
Cat. X17029 ..... $89

DRIVE CARD
Cat. X17019 ..... $79

80 COLUMN CARD
Cat. X17025 ..... $85

SUPER SERIAL CARD
Cat. X17035 ..... $119

RGB CARD
Cat. X17039 ..... $79

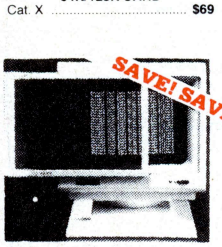
PAL COLOUR CARD
Cat. X17027 ..... $95

Z80 C/M CARD
Cat. X17041 ..... $59

APPLE* IIe COMPATIBLE CARDS

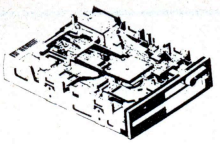
80 COLUMN/64K CARD
Cat. X $69

64K/128K CARD
Cat. X $69



ANTI GLARE SCREEN

Half the price of other brands!!
Relieve eye strain and headaches and increase productivity with these Anti Glare Screens. Suitable for 12" monochrome and colour monitors.
Cat. X99995 ..... $24.95



NEC DISK DRIVES

3½" DISK DRIVE

- 1 M/Byte unformatted, (640K formatted),
- Double sided, double density,
- Access Time 3m/sec

Cat. $265

5¼" SLIMLINE

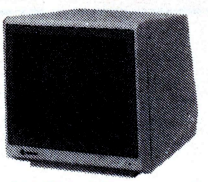
- Switchable 1.6 M/Byte to 1 M/Byte unformatted
  1.2 M/Byte to 720K formatted
- Double sided, double density,
- AT compatible

Cat. C11906 ..... $295

8" SLIMLINE

- Double sided, double density,
- 1.6 M/Byte unformatted.

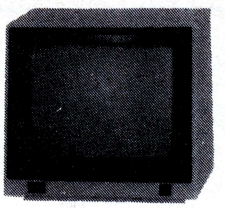
Cat. C11908 ..... $795



SAMSUNG TTL MONITOR

A quality 12" TTL monitor, with a high contrast, non-glare screen at a very reasonable price!
SPECIFICATIONS:
CRT: 12" diagonal 90° deflection, non-glare screen.
Active Display Area:
216(H) x 160(V)mm
Display Characters: 2,000
(80 characters x 25 lines)
Scanning Frequency:
Horizontal: 18.432 + – 0.1KHz
Vertical: 50 HZ + – 0.5%

Description	Cat.No.	1-9	10+
Green	X14517	$189	$179
Amber	X14518	$189	$179

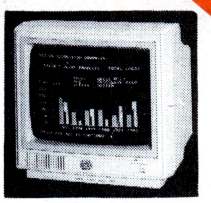


SAKATA 13" RGB COLOUR MONITOR

High quality IBM* compatible monitors, great with VCR's too!

SPECIFICATIONS:
CRT: 13", 90° deflection colour
Input Signal:
Video Signal: Separate video signal
Video: Positive
Sync.: Positive
Input Level: TTL Level
Scanning Frequency:
Horizontal: 15.7KHz
Vertical: 60Hz
Display Size: 245(H) x 182(V)mm
Resolution:
Horizontal: 640 dots
Vertical: 200 lines

Cat. X14530 ..... $695

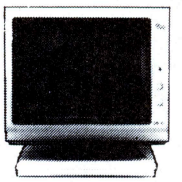


INTRA 14" RGB HIGH RESOLUTION COLOUR MONITOR

Compatible with IBM* and compatibles, and EGA Cards.
Why pay more?
Resolution: 640 x 350 dots
Dot pitch: .31mm
Display Format: 80 x 25 characters
Cat. X14514 ..... **Normally $1,295**
Our price $995

INTRA 14" RGB COLOUR MONITOR

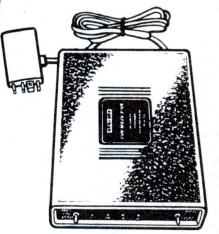
Resolution: 640 x 200 dots
Display Format: 80 x 25 characters
Display Colours: 16
Dot pitch: .39mm
Sync Horiz. Scan Freq: 15.75 KHz
Sync Vert. Scan Freq: 50Hz
Band Width: 18MHz
Cat. X14520 ..... $695



RITRON 2 MONITORS

Stylish 20MHz, non-glare 12 inch monitors available in green or amber displays and featuring swivel base that tilts forward and back and swivels right to left!
Green Cat.X14506..**Normally $235**
Amber Cat.X14508..**Normally $239**
SPECIAL, ONLY $199

ROD IRVING ELECTRONICS FOR ONE STOP BARGAIN SHOPPING!



SENDATA DIRECT CONNECT MODEM

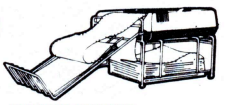
- CCITT V21 300 baud full duplex
- CCITT V23 1200/75
- Bell 103 300 Full duplex
- Bell 202 1200 Half duplex
- Auto answer, auto disconnect
- LED display for Power, TX, RX, CD
- AC power adaptor included
- DB25 pin connector
- Telecom Approval N° C83/37/1045

Cat. X19120 ..... $295
(SOFTWARE FOR VIATEL .. $95)

IBM* COMPATIBLE DISK DRIVES

Tired of paying out more for Japanese Disk Drives? These "direct import" Hong Kong disk drives are the solution! They feature Japanese mechanical components, yet cost only a fraction of the price!

Cat.No.	Description	Price
C11801	500K	Normally $199
		SPECIAL, ONLY $179
C11805	1.6 M/Byte	$259



PAPER TAMER

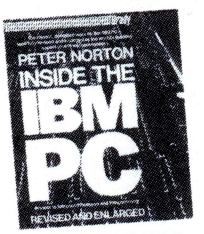
- Restores order to the top of your desk or work area
- Made of white plastic coated steel
- Stores up to 900 continuous sheets
- Allows perfect paper feed
- Allows easy examination of print out

C21050 (10") ..... **only $49.95**
C21050 (15") ..... **only $79.95**
(Printer and paper not included)

CANON A-40 PRINTER

- Serial Impact Dot Matrix
- 140 C.P.S
- Near Letter Quality Mode
- 1.4K Buffer

Cat. C20040 ..... $595



INSIDE THE IBM PC

(Revised and expanded edition)
-Peter Norton
The widely acclaimed guide to the IBM PC's inner workings. The latest edition now covers every model of the IBM micro: PC, XT and AT, and every version of DOS from 1.1 to 3.0
B20080 ..... $44.95

PRINTER RIBBONS

CP80, BX80, DP80, BX100, MB100
ALL A CRAZY LOW $9.95

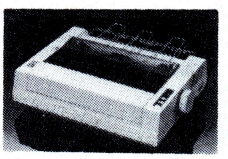
20 M/BYTE HARD DISK DRIVE FOR IBM* AND COMPATIBLES

NEC drive with DTC controller card.
Cat. X20010 ..... **WAS $995**
SPECIAL, ONLY $850
*IBM is a registered trade mark.

PRINTER LEAD FOR IBM*

- Suits IBM* PC XT and compatibles
- 25 pin "D" plug (computer end) to Centronics 36 pin plug

Cat.P19029 1.8 metres . $17.95
Cat.P19030 3 metres $22.95



SUPER 5 EP-1201 DOT MATRIX PRINTER

- 120 C.P.S.
- Pica or Elite character set
- Print Modes: NLQ, Dot Graphics, Proportional Font, Draft.
- Proportional Printing
- Reliable and Compact
- Proportional Printing
- Logic Seeking
- 1K Printer Buffer

Cat. C20035 ..... **only $595**

IBM PC TROUBLESHOOTING & REPAIR GUIDE

-Robert C. Brenner
Keep your IBM PC in top operating condition with this handy reference book. Inside you will find pages of schematics, photos and block diagrams to help you identify problems. Simple instructions tell you what's wrong and how to fix it fast.

- Make most repairs with few or no tools
- Quickly zero-in on a malfunctioning component
- Reduces downtime
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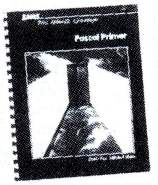

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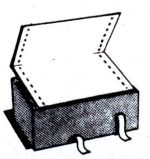

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pose of setting up such a menu, the Procedure 'Perform—Choice' must be fleshed out to select and execute the tasks required by the author. The basic outline of 'Perform—Choice' is given in the code. Its role in life is not only to nominate a task to be performed but also to determine the continuing status of the menu; either (as in Listing 6) it can always set 'Complete' to TRUE, or this can be a selective process depending on the choice made.

Whilst I don't claim that this menu system is novel, bulletproof or extremely powerful, I have found that people who use an IBM PC on a casual basis will find it easy to use and familiar, especially if they have had some experience with Lotus 1-2-3, Symphony, dBASE III, R:BASE, Reflex or Framework. □

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```
'{
////////////////////////////////////////////////////////////////
Menu routines for Turbo Pascal on the IBM PC (or near offer)
By       :P.R.Hill
Date     :28/2/'87
Revised  :28/2/'87
Revision:Help procedure added
////////////////////////////////////////////////////////////////
}
CONST
NormVid=7;
HighVid=15;
Inverse=112;

VAR
Invoke  :ARRAY[1..2] OF BYTE;

{$IWIND.INC}
{$IKB.INC}

PROCEDURE Init;
BEGIN
   Set_Screen_Address;
   WindowsOpen:=0;
   Invoke[1]:=47;
   Invoke[2]:=0;
END;

PROCEDURE Help;
BEGIN
   New_Window(NormVid,5,20,75,25);
   WAL(NormVid,12,22,'Press ESC to Escape,
         ENTER or the first letter to select.');
   WAL(Inverse,25,23,'Press any key to continue.');
   GetScanCode(ASCIIByte,ScanByte);
   Close_Window;
END;

PROCEDURE Show_Menu;
CONST
MaxWidth =5;
MaxDepth =5;
TYPE
Str10   =STRING[10];
VAR
Choices  :ARRAY[1..MaxWidth,1..MaxDepth] OF Str10;
DepthAry :ARRAY[1..MaxWidth] OF INTEGER;
OldWidth,
OldDepth,
Width,
Depth,
Count1,
Count2   :INTEGER;
Complete :BOOLEAN;
     PROCEDURE Set_Menu_Data;
     BEGIN
       {set up the menu contents}
       Choices[1,1]:='File';
         {how deep is this main option?}
         DepthAry[1]:=5;
         {first sub option}
         Choices[1,2]:='Save';
         {next sub option}
         Choices[1,3]:='Retrieve';
         {next sub option}
         Choices[1,4]:='View';
         {next sub option}
         Choices[1,5]:='Delete';
       {another main option}
       Choices[2,1]:='Recalc';
         DepthAry[2]:=3;
         Choices[2,2]:='Manual';
         Choices[2,3]:='Auto';
       Choices[3,1]:='Options';
         DepthAry[3]:=5;
         Choices[3,2]:='1-Opt';
         Choices[3,3]:='2-Opt';
         Choices[3,4]:='3-Opt';
         Choices[3,5]:='4-Opt';
       Choices[4,1]:='Print';
         DepthAry[4]:=3;
         Choices[4,2]:='Go';
         Choices[4,3]:='Abort';
       Choices[5,1]:='Quit';
         DepthAry[5]:=3;
         Choices[5,]:='Exit';
         Choices[5,3]:='Return';
     END;

     PROCEDURE Perform_Choice(x,y :INTEGER);
     BEGIN
       Complete:=TRUE;
       {
       this procedure contains your code to perform
       your menu choices based on Width and Depth,
       corresponding with the Set_Menu_Data above.
       e.g.
       CASE x OF
         1:BEGIN
             CASE y OF
               2: Save_Current_File;
                                                    3: Get_New_File;
             END;
             etc.
       }
     END;
     PROCEDURE Sub_Menu;
       PROCEDURE Sub_Option_Window;
       BEGIN
         {reset the old depth}
         OldDepth:=3;
         {start with first sub-menu choice}
         Depth:=2;
         {open a new sub-window}
         New_Window(HighVid,(Width*10)-7,4,(Width*10)+4,4+
         DepthAry[Width]);
         {show the selected option}
         WAL(Inverse,(Width*10)-6,5,Choices[Width,Depth]);
         {show non-selected options}
         FOR Count2:=3 TO DepthAry[Width] DO
         WAL(NormVid,(Width*10)-6,3+Count2,Choices[Width,Count2]);
       END;

     BEGIN
       Sub_Option_Window;
       REPEAT
```

Listing 6. MENU.PAS: *menu routines for Turbo Pascal on the* IBM PC *(or near offer).*

```
    {save so that we can tidy up}
    OldDepth:=Depth;
    GetScanCode(ASCIIByte,ScanByte);
    {if it's a cursor control key}
    IF ASCIIByte=0 THEN
    BEGIN
      CASE ScanByte OF
        59:{F1 function key..get help!}
           Help;
        72:{UpArrow}
           BEGIN
             Depth:=Depth-1;
             {if we run off the end then loop}
             IF Depth<2 THEN Depth:=DepthAry[Width];
           END;
        80:{DownArrow}
           BEGIN
             Depth:=Depth+1;
             {if we run off the end then loop}
             IF Depth>DepthAry[Width] THEN Depth:=2;
           END;
        75:{LeftArrow}
           BEGIN
             {select another sub-menu}
             {reset the width}
            Width:=Width-1;
             IF Width<1 THEN Width:=MaxWidth;
             {close the current window}
             Close_Window;
             Sub_Option_Window;
           END;
        77:{RightArrow}
                BEGIN
                  {same as LeftArrow, only different}
                  Width:=Width+1;
                  IF Width>MaxWidth THEN Width:=1;
                 Close_Window;
                  Sub_Option_Window;
                END;
              71,73:{Home and Pg Up respectively}
                      Depth:=2;
              79,81:{End and Pg Dn respectively}
                      Depth:=DepthAry[Width];
          END;
        END
        ELSE
        BEGIN {Not a special key}
          {if it was carriage return}
          IF ASCIIByte=13 THEN Perform_Choice(Width,Depth)
          {otherwise, is it the first letter of a choice?}
          ELSE
          FOR Count2:=2 TO DepthAry[Width] DO
            IF UpCase(Chr(ASCIIByte))=UpCase(Choices[Width,Count2][1])
               THEN Perform_Choice(Width,Count2);
        END;
        {highlight the current selection}
        WAL(NormVid,(Width*10)-6,3+OldDepth,Choices[Width,OldDepth]);
        {and 'un-highlight the old selection}
        WAL(Inverse,(Width*10)-6,3+Depth,Choices[Width,Depth]);
        {until we get an 'Esc' or task performed}
      UNTIL ((ASCIIByte=27) OR (Complete));
      {Reset ASCIIByte so no premature exit}
      ASCIIByte:=0;
      Close_Window;
      {Highlight the main menu choice again}
      WAL(Inverse,(Width*10)-7,3,Choices[Width,1]);
    END;

BEGIN
  {set up the options}
  Set_Menu_Data;
  Complete:=FALSE;
  {open and frame a work area}
  New_Window(Inverse,1,1,10*MaxWidth,5);
  {write the first selected choice in highlight}
  WAL(Inverse,3,3,Choices[1,1]);
  {and the rest in normal video}
  FOR Count1:=2 TO MaxWidth DO
     WAL(NormVid,(Count1*10)-7,3,Choices[Count1,1]);
  Width:=1;
  Depth:=1;
  REPEAT
    GetcanCode(ASCIIByte,ScanByte);
    {if it's a cursor control key}
    IF ASCIIByte=0 THEN
    BEGIN
      {save the old value so we know where we've been}
   OldWidth:=Width;
   CASE ScanByte OF
     59:{F1 function key}
        Help;
     75:{Left Arrow}
        BEGIN
          {decrement the setting}
          Width:=Width-1;
          {did we run off the end? Then loop!}
         IF Width<1 THEN Width:=MaxWidth;
        END;
     77:{Right Arrow}
        BEGIN
          {just like 75}
          Width:=Width+1;
          IF Width>MaxWidth THEN Width:=1;
        END;
     71,73:{Home and Pg Up respectively}
        Width:=1;
     79,81:{End and Pg Dn respectively}
        Width:=MaxWidth;
     80:{Down Arrow}
        BEGIN
           {tidy up}
           WAL(NormVid,(Width*10)-7,3,Choices[Width,1]);
           {and show sub selections}
           Sub_Menu;
        END;
   END;
   {unhighlight the old choice}
   WAL(NormVid,(OldWidth*10)-7,3,Choices[OldWidth,1]);
   {and highlight the new choice}
   WAL(Inverse,(Width*10)-7,3,Choices[Width,1]);
END
ELSE
BEGIN {Not a special or cursor key}
  {did some-one hit return?}
  IF ASCIIByte=13 THEN
  BEGIN
    WAL(NormVid,(Width*10)-7,3,Choices[Width,1]);
    {open the sub menu}
    Sub_Menu;
  END
  ELSE
    {or maybe it's the first letter of a choice}
    FOR Count1:=1 TO MaxWidth DO
      {if so...}
      IF UpCase(Chr(ASCIIByte))=UpCase(Choices[Count1,1][1]) THEN
      BEGIN
        {tidy up}
        WAL(NormVid,(Width*10)-7,3,Choices[Width,1]);
        {reset the width to the chosen function}
        Width:=Count1;
        {and call the sub menu}
        Sub_Menu;
          END;
    END;
    {until Escape hit or we have performed a useful function}
    UNTIL ((ASCIIByte=27) OR (Complete));
    {get rid of the main menu}
   Close_Window;
    {and drop back into user code}
END;
BEGIN
  {get screen type etc.}
  Init;
  GetScanCode(ASCIIByte,ScanByte);
  {is it the Slash (/) key?}
  IF Invoke[1]<>0 THEN
  BEGIN
     IF ASCIIByte=Invoke[1] THEN Show_Menu;
  END
  ELSE IF ScanByte=Invoke[2] THEN Show_Menu;
  {otherwise, wind up}
END.'
```

User-Defined Functions

for structured programming in Basic

Is your code impossible to read? Cluttered? Hard to maintain? A hassle to move to a different version of Basic? — Then you need User-Defined Functions from Jeff Richards!

USER-DEFINED functions are one of the few aids to structured programming available to the Basic programmer. Carefully using them can lead to programs that are easier to understand and maintain. In many cases the program will also be more compact and will execute faster.

The examples presented here are in Microsoft Basic, and should work for most of its implementations. They will also apply to other Basics that support user-defined functions, with the possible exception of using logical expressions as values.

The definition of a user-defined function is —

```
DEF FNname[(parameter0__list)]
=expression
```

and the function is used as if it was an expression, in the form —

```
FNname(argument0__list)
```

For example, the definition of a simple mathematical function to calculate the distance between two points on a plane (using cartesian coordinates), is —

```
10 DEF FNDIST(X1,Y1,X2,Y2)
   =SQR((X2—X1)^2+(Y2—Y1)^2)
```

A typical reference, which gives the distance from the origin to the point (A,B), might be —

```
100 PRINT FNDIST(0,0,A,B)
```

In order to evaluate the function the value 0 is substituted for X1 and Y1, the value of A is substituted for X2 and the value of B for Y2. The statement is functionally identical to —

```
100 PRINT SQR((A—0)^2+(B—0)^2)
```

This demonstrates why the variables named in the parameter list are referred to as dummy variables. When the function is evaluated, these variables are replaced by the actual values (constants or variables) taken from the argument list. Thus it is important that the values in the argument list match, in type and number, the dummy variables specified in the parameter list. It is important to remember that any variables in the program that may share the same name as variables in the parameter list (X1,Y1,X2 and Y2 in this example) are not affected by the use of the function.

If a variable in the expression part of the function does not appear in the parameter list, then the current value of the variable is used, or 0 if the variable has not yet been assigned a value. It is good programming practice to include all variables required for a function in the parameter list (and some would claim that Basic should enforce this rule). A possible exception would be 'global' variables such as pi = 3.14159.

It should also be noted that functions have a 'type' — integer, single precision, double precision or string — in exactly the same way that variables do. The type of a function is determined by the special character appended to the function name, the effect of a 'DEF type' statement, or the default type.

Mathematical functions are a typical use for user-defined functions. Microsoft Basic requires that the arguments to the transcendental functions — SIN(), COS() and TAN() — are in radians. For many problems it is convenient if the argument is in degrees. This conversion can be implemented in user-defined functions —

```
DEF FNSINE(N)=SIN(N/57.2958)
```

Similarly, the unimplemented functions SEC(), COSEC() and COT(), can be easily implemented as user-defined functions using the supplied intrinsic functions.

The are many reasons for using a function, but the best one is *simplicity*. Any expression that is reasonably complex and is used repeatedly, is a candidate for a function. This will make the code less cluttered, easier to read, more maintainable, and easier to move to a different version of Basic. An example of a function that simplifies coding, and also demonstrates a function of type string, is –

```
20 DEF FNINS$(A$,B$,N)=
   LEFT$(A$,N)+B$+RIGHT$
   (A$,LEN(A$)—N)
```

This function inserts the string B$ after position N in string A$. It might be used in the simple expression —

```
200 C$=FNINS$("abcdefgh","f",5)
```

— which would assign the string "abcdefgh" to C$. The advantages in elimination of repetitive code, and the possibility of coding errors, should be a obvious.

Other procedures that are candidates for functions are not so obvious. Because functions must evaluate an expression to return a single result, they cannot be used for routines that require an IF statement or a FOR-NEXT loop. However, many routines can be forced into a function format by using logical expressions. A logical expression is a logical relation that is used to return a value — in Microsoft Basic the value is –1 for true and 0 for false. Thus the expression A=(B=C) would set A to –1 if B was equal to C, or it would set A to 0 if B was not equal to C.

A typical use for this feature is in a function to find the maximum (or minimum) of two values. This would usually be expressed as IF B>C THEN A=B ELSE A=C.

User-Defined Functions

The are many reasons for using a function, but the best one is simplicity. Any expression that is reasonably complex and is used repeatedly is a candidate for a function.

However, as a single expression it can be recast as —

```
30 DEF FNMAX(A,B)=
   -A*(A>B)—B*(B=>A)
```

In this case, if A is greater than B, the expression becomes –A*(—1)—B*(0), which reduces to A. If A is less than or equal to B then it becomes –A*(0)-B*(-1) which reduces to B. There are other ways of achieving the same result, but this is as convenient as any.

Similar use of logical expressions can simplify otherwise tedious tasks. A common requirement when dealing with operator input is to convert lower case characters to upper case before testing. A function that uses logical expressions can do the job simply —

```
40 DEF FNUPPER$(A$)=
   CHR$(ASC(A$)+32*(ASC(A$)>96
   AND ASC(A$)<123))
```

This can be translated as 'Take the ASCII value of the character. If it lies between 96 and 123 then subtract 32. Convert the number back to a character and return it as the result of the function.'

Note the use of the intrinsic functions ASC() and CHR$() in this example. In fact, any function, intrinsic or user-defined, can be referenced in a user-defined function. This makes 'stacking' of functions possible as the next example shows. This function uses FNUPPER$ to convert the first character of a string to upper case —

```
50 DEF FNCAPS$(A$)
   =FNUPPER$(A$)+RIGHT$
    (A$,LEN(A$)—1)
```

String functions are particularly useful in user-defined functions. Allied with the need to convert operator input to upper case, is the need to check the input for validity. A simple function that compared a character with a predefined set of alternatives might look like this —

```
60 DEF FNCHOICE(A$)=
   INSTR("ABCDEF",FNUPPER$(A$))
```

Such a function returns 0 if the character was invalid, or a number between 1 and 6 representing the characters 'A' to 'F' in upper or lower case. It would be used in a typical program with —

```
600 INPUT ANS$:IF FNCHOICE(ANS$)=
    0 GOTO 600
```

But any intrinsic function can be used in a user-defined function, including some that may not appear to be simple functions. For instance, INPUT$() is a function. It could be used in the above example to get the input from the operator. This also simplifies the use of the function.

```
70 DEF FNSELECT=
   INSTR("ABCDEF",FNUPPER$
   (INPUT$(1)))
700 WHILE NOT FNSELECT:WEND
```

In practice, it would be preferable to make the function more general and to indicate in the use of the function just what was going on —

```
70 DEF FNSELECT(A$)=
   INSTR(A$,FNUPPER$(INPUT$(1)))
700 WHILE NOT FNSELECT
   ("ABCDEF"):WEND
```

Such a function could also be used directly to control program flow —

```
700 ON FNSELECT("ABCDEF")
   +1 GOTO 700,800,. . .
```

Other tricks are available to permit procedures to be coded into functions rather than as subroutines or IF statements. A requirement to return the description associated with a number, for instance the month of the year, given a date, might be tackled with a string array initialized to the month names and referenced on the month number.

Such a procedure requires that a variable name be set aside for the array, and several lines of initialization code will be required at the start of the program. Using a function to perform the job eliminates the use of a special variable, and the initialization is reduced to the single DEF FNname statement.

The problem is easy if the strings are all the same length, but can still be worthwhile even when the strings differ in size. An example that displays the status of a series of points in a network might be –

```
80 DEF FNSTATE$(N)=
    MID$(" ONOFF ?",N*3—2,3)
800 FOR I=1 TO MAXSW:PRINT I,
    FNSTATE$(ST(I)):NEXT
```

Note that the strings — "ON", "OFF" and "?" — have been forced to the same length to simplify things.

There are circumstances when functions can be used to implement a 'brute force' programming technique that would be unmanageable if it had to be repeatedly coded in-line, but is much faster than a subroutine call. An example is the problem of counting the number of '1' bits in a character — a problem common in error checking procedures. A function to do the counting is —

```
90 DEF FNCOUNT(A)=
   (A AND 64)/64+(A AND 32)/32+
   (A AND 16)/16+(A AND 8)/8+
   (A AND 4)/4+(A AND 2)/2+(A AND 1)
```

This function operates about twice as fast as a subroutine and a FOR-NEXT loop. A matching function to return the character with its high-order bit set, if required, to ensure an even number of '1' bits is —

```
91 DEF FNPEVEN$(A$)=
   CHR$(ASC(A$)OR &H80*
   (FNCOUNT(ASC(A$))MOD 2))
```

And a final example, given in Listing 1, demonstrates the value of functions in a library of 'tools' — procedures that perform defined tasks and can be included in any program merely by copying from a library of procedures. In this usage the complexity of the function is irrelevant. What might be considered overly complex and opaque coding is acceptable in a tool that has been carefully debugged and documented. □

```
99 DEF FNDAY$(D,M,Y)=MID$('SunMonTueWedThuFriSat',((D+2*
      (3-(Y\100 MOD 4))+(Y MOD 100)\12+(Y MOD 100 MOD 12)
      +(Y MOD 100 MOD 12)\4+VAL(MID$('033684625032',M,1))
      -10*(M=12)+((M<3) AND (Y/4=Y\4) AND NOT
      (Y/400<>Y\400))MOD 7)*3+1,3)
```

Listing 1. *The function returns the day of the week for any date in the Gregorian calendar after September 13, 1752 (when the calendar was adjusted by four days). It uses most of the tricks described, including logical expressions. It also uses substrings referenced on a variable for both the day name and the magic number for the month (but note that the magic number 12 for December needs special handling). Integer divide ('x\y') is a briefer way of expressing* INT(x/y).

Software

Enhanced ProDesign II CAD ▷
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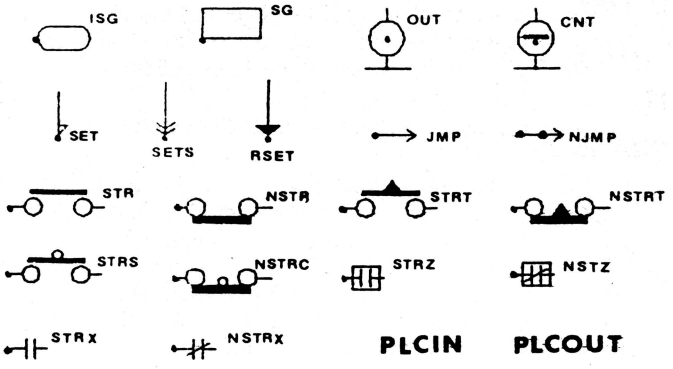
Technical Imports Australia has released two extensive symbol libraries to run on the ProDesign II CAD package. The package is a 2D (two-dimensional) CAD system which works on IBM PCs and clones and is primarily designed for the local electronics industry. There are two libraries; the first is a comprehensive list of over 100 objects comprising electronics, wave forms, transistors, digital logic resistors, capacitors, diodes, lamps, power sources, rectifiers, transformers, switches, generators, contacts and other symbols. The second package is a library of Hydraulic and Pneumatic Engineering Industry standard symbols. Over 150 symbols have been used giving the Australian SAA standard reference number. These symbols include a reference origin or pickup point which allows easy insertion into the drawing and precise location when joining to other objects. Prodesign costs $550 and the libraries cost $121 for the electrical symbols, and $137 for the Hydraulic Engineering symbols.



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For those programmers looking to try a new program editing package, there is a package from the producers of WordPerfect wordprocessing software, distributed in Australia by Mini Computer Systems. The new package is designed to allow programmers to concentrate on the program rather than the mechanics used to type and modify it. The edit package has simple procedures for doing common tasks such as duplication and the deletion of text, search and replace, insertion, combining of multiple text files, and performing complex repetitive tasks. The program is tailored for the inexperienced user with comprehensive online help facilities, which means that you don't have to remember many editing commands. Function keys can be modified to help perform specialised commands which can be saved permanently to disk. The editor runs on IBM PC's and compatibles. Features include a full-screen edit which displays 23 lines of the program while you are editing, selected printing of a page or entire file to be produced on any printer, search and replace and text search functions can be done through the whole text file, forward or backwards. For any specified text string, help screens can be displayed without affecting the text. There can be an unlimited number of marked blocks and two files can be edited at — this provides a copying technique to copy sets of subroutines or segments of programming text from one program to another.

Qikdraw
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Phone: (02) 41-9656
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An Adelaide computer company, Chan Computing Services , has developed the first Australian computer aided design (CAD) software package to run on a microcomputer. Qikdraw, which is being exported to China and Russia, is designed to run on the NEC APC IV. It comes in two modules, a 2D module which handles basic drawings, mechanical layouts, electrical semantics and similar tasks. The 3D module provides a flexible modeling system and work can be transferred between the two. All file names and command calls are instantly prompted on the screen, and the software features automatic shadowing which includes a simulated light source, which is usually only found on mini or mainframe systems.

Superbase Personal ▽
Precision Software
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Price: not telling
A new version of Superbase Personal for the Commodore Amiga, has been released after the first version was found to be incompatible with the operating system supplied in Australia. The new version, 1.046, has corrected a problem with the page length which was found to come up short when users went to print out. Other modifications have been added to the database which now features greater provision for keyboard operation with an increase in the number of define keys, improved directory changing and a lifting of the limits on the number of fields available.

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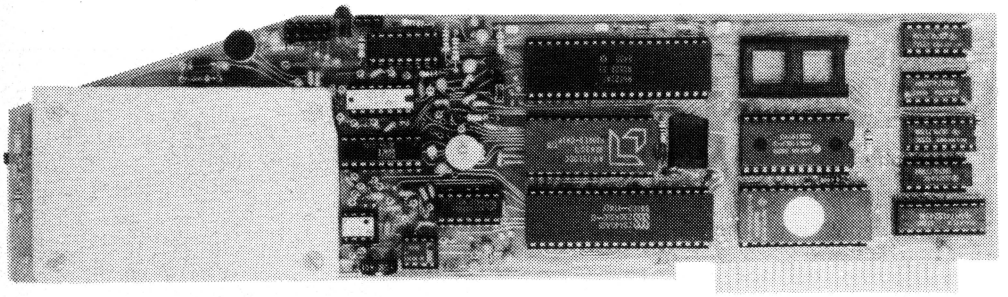

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* Super intelligent direct connect MODEM/VIATEL terminal for APPLE II, IIE & compatibles fully contained on a single card — plugs into slot#2 — does not require separate serial card or software. All software is permanently resident in an onboard 128K EPROM. It is hidden in the slot#2 card space, leaving the whole of memory completely free for other programs unlike disk based comms software which must occupy the main memory excluding other programs. It is menu driven and automatically senses for ProDos or DOS 3.3 operation. Received files are appropriately converted before saving and can be used.

Sending/receiving files is very simple:—
— Press "ESC" to display menu.
— Select "(S) END A FILE" option
— Answer the prompt "FILENAME?:"

The modem will search the disk for the file, make all the decisions (e.g. binary, basic, textfile, DOS 3.3 or ProDos) and transmit it in the correct format. <CR> transmits the file in memory. Similarly to receive a file select "(R) ECEIVE A FILE" option.

* AUTO ANSWER — AUTO DIAL. Senses true dial tone, ring tone, busy tone and acts intelligently, returning status messages. Characters can be included in the phone number to set baudrate, pause, "await dialtone" and multiple redial on busy. On answer, it selects the incoming baudrate by precision frequency measurement. This is much more reliable than the normal autosearch using carrier detect which is often confused by voice and phone tones. A reliable autosearch is a must for bulletin board operation.

* 300 Baud full duplex or 1200/75 and 75/1200 with fast automatic line turnaround. An upgrade kit to add V22 (1200/1200 baud) and V22 Bis (2400/2400 baud) will be available later.

*Main menu option "(V)IDEOTEXT" shows the VIATEL menu. It becomes a full graphics VIATEL terminal, automatically dialling and transmitting the user ID stored in the battery backed ram. When online, a keypress will immediately save pictures to memory. These can be reviewed later and selectively saved to disk or printed (requires a graphics printer card). Pictures can be loaded from disk and printed out. The modem can act as a videotext host and can be programmed to act on frame information. e.g. — use the clock to ring "MONEYWATCH" hurly and dial you at the office if your shares move outside a given range.

* TELESOFTWARE DOWNLOAD facility to purchase programs over VIATEL from suppliers such as MICROTEX 666 and TANGO.

* A full wordprocessor in EPROM for pre-composition of text before transmission. It can also be used to edit or print received files as well as for general wordprocessing.

* Onboard battery backed calendar clock can time and initiate calls or keep an activity log. ProDos uses it to time and date disk files and it is accessible from Basic.

* 2Kx8 battery powered CMOS RAM stores default parameters, phone numbers, ID, password, logon strings, search codes and setup parameters (e.g. baud rate, parity, printer ON) for each number, allowing single keystroke call establishment to specific areas of complex databases. Main menu option "(T)ELELIST" displays the list of 23 names and one is selected.

* Incorporates XON/XOFF and CHRISTENSEN error correcting protocol. Textfiles are not so fussy but error correction is a must when transferring program files. A debug function can display normally invisible control characters sent by the host.

* Can output directly to printer even when online at 1200 Baud — a fast printer is not required as the printer is spooled out of the receive buffer. A "FILTER" function is available to remove screen control characters from textfiles (these can drive a printer crazy). Special scroll routines print to 80 column screen and printer at 1200 Baud without any lost characters.

* Unique "PHANTOM MODEM MODE" function allows the modem to be permanently connected with the normal phone. When answering, if it doesn't immediately detect a calling modem it generates ringing tone back to the calling party and sounds the APPLE bell, giving you 60 seconds to answer the phone.

* If you have previously purchased this modem and have not yet received an updated EPROM VERSION V2.18 and a manual, contact AUTOMATIC ICE CO. — there is no charge for these.

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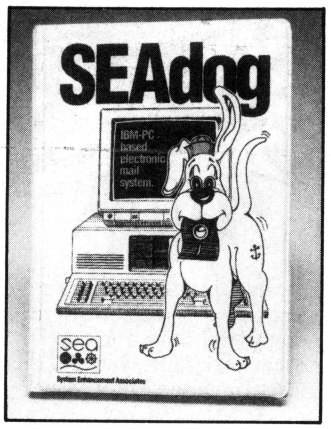
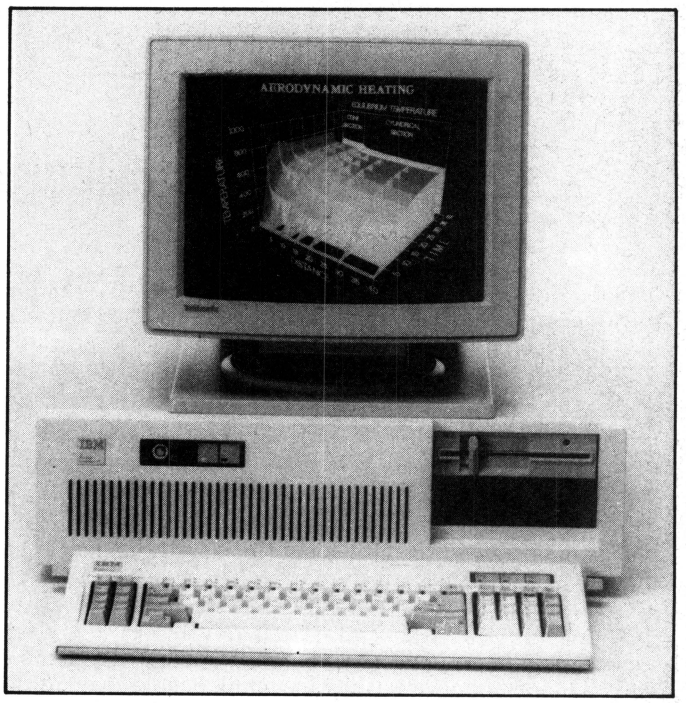


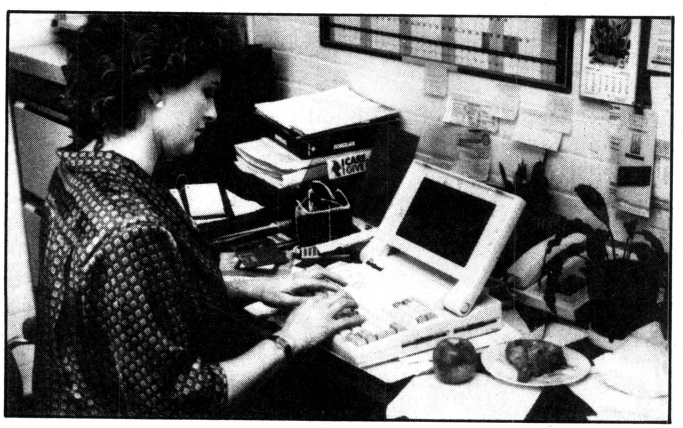
SEAdog △
Systems Enhancement Australia
Phone: (02) 922 6658
Price: Not supplied
For those wanting to get their sea legs with an electronic mail System, there is the SEAdog, from those same programmers who brought you ARC. SEAdog is a full-featured electronic mailing system which operates on personal computers using standard telephone lines. It consists of two integrated parts: a user interface program which is used to enter and read mail messages, and a network server which is left running when the machine is not being used. The message delivery and receiving is done automatically in the early hours of the morning, to take advantage of lower phone charges. There is an emergency or priority 'crash mail' mode which allows the receiving and sending of urgent messages. A feature of SEAdog is SEAlink, a sliding window variation of Xmodem. SEAdog supports Hayes compatible modems from 300 to 19,200 bps.

Wordcraft Version 3
Personal Computer Software
Phone: (02) 923 2899
Price: Not supplied
For those users who have been using the old version of Wordcraft, the word processing package, the new version may be interesting with improved features such as multi column working, which gives versatility enough to work on up to seven text columns across an A4 page. Columns may be different widths with different inter column spacing and information may be entered into each column in independently. The package also allows access to electronic mailing systems such as OTC's Minerva. It can communicate with mini or mainframe computers, and international databases such as Dialog and bulletin boards. There is an inbuilt database which can be used to provide information to the direct mailing system to produce letters, envelopes and labels. There is a spelling checker in the package which can be directed to check a page, a range of pages or a complete document. With this range of options it's no wonder it takes a minimum 512 Kbyte IBM PC/XT/AT to operate with a hard disk recommended.

New Machines

Multispeed Portable Computer ▽
NEC
Phone: (02) 428 1666
Price: $3000 (plus tax)
A new entrant into the highly competitive portable computer market is the NEC Multispeed portable. Some of the features of the little beast are a healthy 9.54 MHz operating clock speed, switchable down to 4.77 MHz and use NEC's V30 chip. NEC have done some work on their screens as well — they now offer with a new 80 column by 25 line 'supertwisted' LCD display providing improved appearances. The machine comes with 640 Kbytes of standard memory, with 128K battery-backed. Standard ports on the computer comprise parallel, serial, CRT (cathode ray tube) and FDC (full duplex connector) ports. The FDC port allows the Multispeed to act as an external drive on an IBM PC/XT for program and data exchange. Two 720K floppy drives are standard. Firmware (software that is provided internally) includes, an outliner and text editor, a notepad with a 20,000 word dictionary, a filer database, Telecom communications and terminal emulation, and a dialler with a directory.





Tektronix Graphics Products △
Tektronix
Phone: (02) 888 7066
Price: Not supplied
Tektronix is a new company going into the advanced PC graphics market with a line of graphics products which operate with the IBM PC/XT/AT and compatibles range. The family range includes the Plot 10 PC4100 graphics co-processor board, a 640 by 480 multiple line rate graphics monitor, and two software emulations called Plot 10 PC-05 and PC-07, emulating their own Tektronix 4105 and 4107 terminals. The high-resolution, high speed graphics is now being provided for personal computers to augment CAD, technical data analysis (TDA) and business presentation graphics. The PC4100 graphics co-processor uses the Texas Instruments TMS34010 graphics system processor (GSP) chip for fast throughput of high level graphics functions which leaves more of the PC processor's computing cycles available for the application. New graphics boards announced by Tektronix have extended the resolution ranges to 1280 by 1024 pixels. The PC4100 board features 256 simultaneous colours from a palette of over 16 million colour and also emulates the IBM PC Enhanced Graphics Adapter (EGA) and Colour Graphics Adaptor (CGA) boards which allows for the compatibility with existing graphics software.

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(40MB, "E.G.A." Colour Monitor) . **$7,530 inc. tax**

NEC MULTISPEED PORTABLE
(9.54 MHz, 2x720K drives, 640K) **$2,985 inc. tax**

NEC SILENTWRITER
(prints 8 pages per minute) ..... **$4,590 inc. tax**

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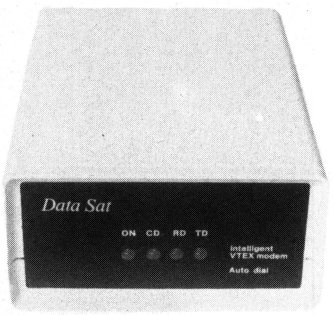
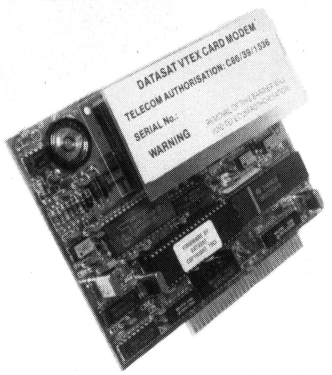
Peripherals and Extensions

Data Sat Videotex Kits ▷
Data Sat Australasia
Phone: (02) 821 1622
Price: see below
Data Sat have released an intelligent modem done called, intelligently, the Intelligent VTEX Desk Modem. It comes as a complete kit and works at 300 and 1200 baud. The software allows you to save function keys in a macro section of the modem which saves repetitive keyboarding. The software also supports ASCII standard communication language, telesoftware and X-Modem protocols, all eight colours on a standard graphics card, automatic upload and download at 1200 baud rate and accessing of a personal computer by remote control. The kit is $555 and $720 for the assembled unit. Check prices of the modems, which are available without the software.





PC-Annex Expansion System
Mace Software
Phone: (02) 922 4344
Price: $1800
If you have a pesty brother or sister, or your small business needs another terminal, then Mace have come up with an excellent idea. They have developed the PC-Annex, (note the similarity to a caravan annex) which plugs into a PC and uses all the software and memory available on the PC. The additional workstation can be located up to 500 feet away and comes supplied with with a workstation adaptor, 50 foot of cable and both Multi-DOS and Multi-lock software. Unlike other multiusers systems, the PC-Annex creates an environment of IBM compatibility which allows you to mix colour, graphics and monochrome monitors into the system. Programs written only for the PC-DOS operating system can be run which extends the usefulness of the existing system. Applications can be unlimited with the family using one terminal while you can still savour the luxury of having your terminal at your disposal.

Dataplex DPX-224 Modem ▽
Dataplex
Phone: (03) 735 3333
Price: Check with them
The nifty feature of this new modem is its ability to pool many users over a pabx system and allow them to go through the one modem. The multi-speed modem can connect to third generation pabx's such as Ericsson's MD110 and the Neax 2400 from NEC. Access to the pool is gained by using existing wiring between the pabx and the phone extensions. The new modem also has an added security feature and remote control to the DPX-224 through new firmware. This allows it to be programmed with a log on sequence which allows only similarly programmed modems to be connected through to a computer port. The security sequence, which shuts the computer or modem down, can be suspended to allow a link up to normal modems. The remote activation of the modem allows users to dial in passwords to activate a modem which could be located in another room, and still get access to an outside line.

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ESSENTIAL DATA DUPLICATOR
Back up your copy-protected disks with **ESSENTIAL Data Duplicator 4 PLUS** ■ **EDD 4 PLUS** is new technology, not just 'another' copy program. The **EDD 4 PLUS** program uses a specially designed hardware card which works with your disk drives to back up disks by accurately copying the bits of data from each track. Don't be fooled . . . no other copy-program/system for Apples can do this! ■ In addition to backing up disks, **EDD 4 PLUS includes several useful** utilities such as examining disk drives, certifying disks, displaying drive speed rpm's, plus more! ■ **EDD 4 PLUS** runs on Apple II, II Plus (including most compatibles), and IIe, and is priced at $190.00 (duodiskl/unidisk 5.25 owners must add $32.00 for a special cable adapter). ■ A standard **EDD 4** version which doesn't include any hardware is available, and can be used on Apple IIc and III (using emulations mode) and is priced at $125.00.
■ Bankcard and Master card accepted by phone. Add $3.00 to all orders for postage and handling.
All orders must be prepaid.
WARNING: **EDD** is sold for making archival copies only.
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83 HALL ST., BONDI BEACH, NSW 2026 PHONE (02) 30 2105

Services

3½ inch Disks for the IBM PS/2
Imagineering
Phone: (02) 697 8666
Price: Not supplied
Software Publishing Corporation, the US manufacturers of the PFS and Harvard range of software, have come out in support of IBM's new Personal System/2 computers which run the 3½ inch disks. All of the software range will be able to run on the PS/2 system.

Free AutoCAD 2.6 Offer
Entercom
Phone: (03) 429 9888
Price: Free!
All purchasers of AutoCAD 2.53i sold on or after March 1 this year, by an authorised dealer (sorry, hackers this time it's not free for you) will be getting an upgrade of AutoCAD to 2.6. All you need is your sales docket proving you purchased in that time. The new version has taken a leap into 3D modeling and visualisation.

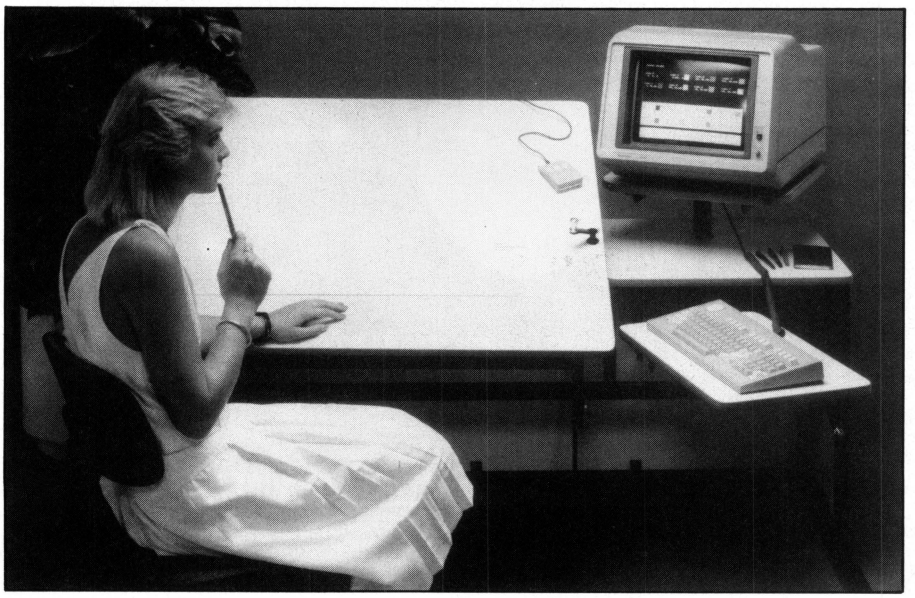
Furniture

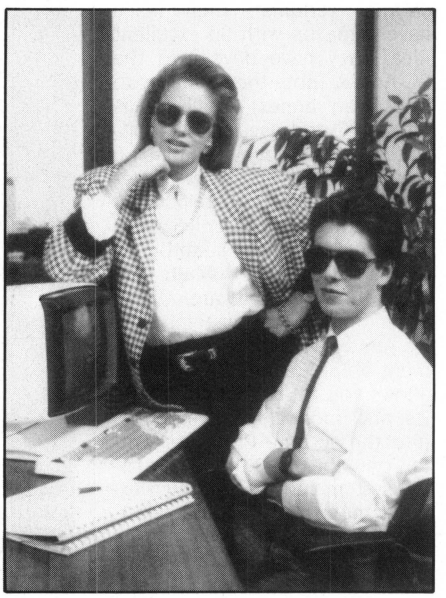
Desk for Cadcam Systems
Sylex Ergonomics
Phone: (02) 647 2888
Price: Not supplied
With the large drawing boards which are still required in many design requirements of computerised cadcam, there is the added advantage of having a versatile work place. Like many of the versatile workstations that we have looked at in the 'New Products' section of YC, this graphics bench has been designed to allow adjustability for the user. The bench positions both equipment and operator to take full advantage of cadcam. Both keyboard and monitor adjust for height and angle as the operator moves forward and backwards and pivots to locate itself beside the planboard. The planboard also tilts and height adjusts. ▷

Miscellaneous

The HHP-1 Portable Photocopier ▽
Sanyo
Phone: (02) 929 4644
Price: Not supplied
We thought you might be interested in hearing about a photocopier which fits into your top pocket. This little wonder of micro technology is only slightly bigger than an average pocket calculator and weights no more than half a kilo. You can copy up to the full roll of 10m thermal paper before replacing or recharging the batteries.

Bolle Comput-irex ▽
Bolle
Phone: (03) 337 4544
Price: $80
Bolle have taken to heart all those programmers and operators who have had the feeling that their eyes are dropping out of their head, and have developed glasses which cut down the glare from visual display terminals. Many computer operators are already using anti-glare screens which fit over the terminal. The glasses are designed, not only to make you look trendy while working, but also to cut down the 'ultra-blue' light which causes most of the strain for eyes. The glasses also cut out the glare from the office lights reflected off the screen — an added bonus designed into the glasses. (Would Bolle them over in the corridors at work.)





BY PAUL ZUCKER

FRAMEWORK IS AN integrated package, but I like to think of it as being more than just that. Granted, it has all of the expected integrated features like word processing, a spreadsheet and a database, but the real beauty of Framework is the range of inbuilt and programmable features which make it a complete PC users productivity tool.

For instance, files from most common packages can be read into and from Framework via the DISK IMPORT or EXPORT functions. Likewise, the APPS SPELL spelling checker function can be used on just about anything from a formula to a database (even a word processing document). Even something as simple as the EDIT WORDCOUNT which counts the words in a document or whatever, becomes an often used tool to the Frameworker.

Communications Facilities

So it is with communications. The comms facilities provided with Framework are extremely powerful and versatile. Even FRED, the programming language which adds so much power to Framework, can be used to fully automate a communications session and integrate it into any other Framework function.

I should point out now that there is one seemingly serious drawback — there is no support for 1200/75 comms as used by Viatel and other Prestel-type services. This is not quite as worrying as you might think, because Prestel screens are basically graphics oriented and are therefore not really suited to Framework's textual strengths. Most modems seem to come with Viatel software these days, anyway. Still — it would be nice next time, Mr Ashton and Mr Tate (I never can remember which is the straight man!).

The communications menus are accessed via the APPS menu first, and then the TELECOMMUNICATIONS sub-menu. Framework menus can be many levels deep, but the desktop analogy is used here as everywhere else in Framework and successive sub-menus are tiled, overlapping to show the path and function (see Figure 1).

Communications Abilities

Without waxing too lyrical over the myriad comms functions available, let's look at a few — first, via a trip into a bulletin board, and then into a commercial data service.

It doesn't take much imagination to realise that these macros could be expanded into a menu driven communications system complete with decision capabilities, delay until a set time, automatic retry and even the ability to transfer files from a second computer in the system to a third.

Comms sessions can be operated at three main levels: You can simply enter the settings and make menu selections as you go until the comms have been established. Or, you can save all settings to a file which is recalled with a couple of keystrokes each time that comms session is needed. Or, a program can be written which will perform all operations completely automatically, including making decisions and providing answers when requested.

As can be seen from Figure 2, the APPS-TELECOMMUNICATIONS-SETUP-SETUP menu holds most of the variables needed for each different comms session. At first, the plethora of options may appear daunting, but remember a very simple rule of thumb: If you don't know what a setting does or what to change it to, leave it set to the default. Once a session's settings are correct, they can be saved under the A/T/S/Write Setup File option. Framework automatically gives these files the extension .TCM.

Some menus in Framework are customizable: the comms menu is one of these. The SETUP program (run outside Framework) allows up to nine communications sessions to be added to the comms menu. This means that you can save the setup as YC.TCM, for example, so that you can dial up the *Your Computer* Bulletin Board from the comms menu.

Another menu allows us to store up to 10 keystroke macros for later use in a comms session. These are most useful for lengthy account numbers or passwords, or even strings of commands frequently used in the comms session. These macros can also be useful where untrained people are using the comms, say for daily uploading

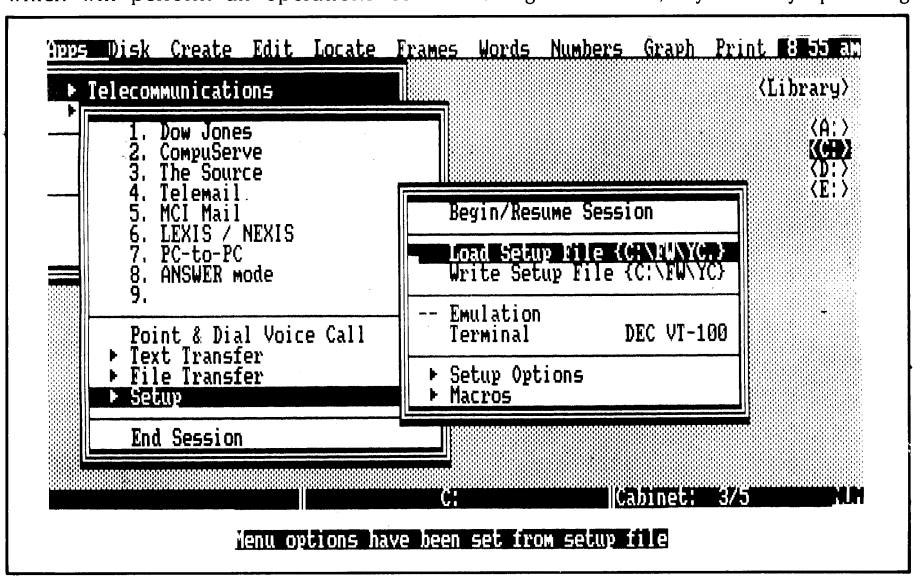


Figure 1. *Framework menus can be many levels deep. Successive sub-menus are tiled, overlapping on the screen, to show the current program path and function — compare the above screen with that shown in Figure 2.*

of sales data via a modem.

Our second example shows how a full blown, automatic system could be written using the FRED programming language. Here, instead of a program contained on a frame, we can make a Macro which will always be available in the Library.

A a Framework macro typically takes the form —

^M0@T?*Crocodile*^M@T?
Dundee{Return}A^MB

— while at first glance it looks like a bad glitch, it actually does this: ^M gives a carriage return, 0 sends 0, @T? waits for a question mark and then sends the first name of the user, *Crocodile*^M, followed by ^M@T?*Dundee*{Return}A^MB, the last name and an A and a B to select the options when finally logged on.

It doesn't take much imagination to realise that these macros could be expanded into a menu driven communications system complete with decision capabilities, delay until a set time, automatic retry and even the ability to transfer files from a second computer in the system to a third.

One scenario for a program could be —

1) Dial a database and download financial figures and then log off;

2) Place the figures in a spreadsheet (Framework does this automatically), then graph them and prepare a report; and

3) Dial another computer and upload the created report (and, if the results are bad enough, submit your resignation while you are at home asleep).

File Downloading

File and text downloading are quite easy with Framework. An advantage of the 'frame' system is that you can move back over previous parts of the session even while it is occurring. If the frame size will not be adequate, everything can be captured to a file. The file can be set to 'get' everything, in which case it will be closed when comms cease, or 'capture' can be turned on only when needed.

This is fine for messages and financial data and the like, but serious file transfer requires some sort of error detecting protocol. To this end Framework uses a number of protocols such as XMODEM.

Direct Connect

Not all communications use a modem. Indeed, a PC can be used as a terminal to another computer system simply by direct connection to the PC's serial port. This is done by selecting the DIRECT CONNECT option and one of the terminal emulations. Another use of direct connect, is the transfer of files between machines which have incompatible disks, even to the extent of copying files from the office PC's 5¼ inch disks to the laptop's 3½ inch ones.

File and text downloading are quite easy with Framework. An advantage of the 'frame' system is that you can move back over previous parts of the session even while it is occurring. If the frame size will not be adequate, everything can be captured to a file.

Remote Access

Another nice feature of Framework comms is the ability to quickly set up your PC for remote access by another machine. For instance, the office PC can be contacted from home if you want get that submission done before the other bloke. Far from leaving the data at the mercy of anyone who happens across the phone number, Framework allows for a PASSWORD. Only three tries are allowed before Framework disconnects. There is even a group of special commands which give partial control over the host computer. These allow functions such as directory listing, drive selection, uploading and downloading of files, and the setting of various protocols and modes.

Summing Up . . .

To sum up, spend a hour reading the Framework *Advanced Topics* manual as it covers these topics in great detail. Have a go at writing some simple macros for things like automatic log-on of your favourite bulletin boards and so on. Why not make up a 'Null Modem ' cable so that you can connect your PC to a friend's for comms sessions. Above all, experiment! (*For more on Framework, see Gordon Castle's 'Framework is a Picture II!' in* YC, *March* '87.) □

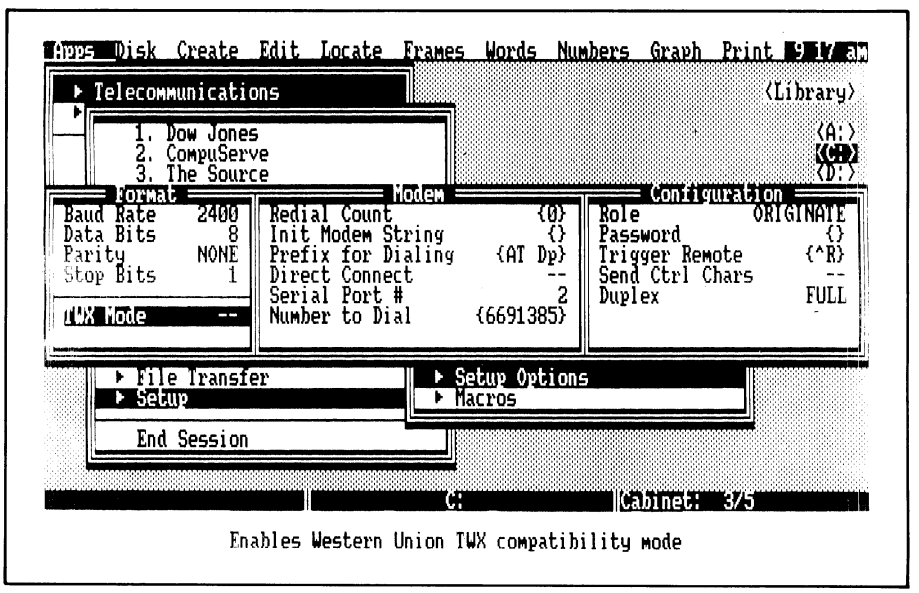


Figure 2. *The above* APPS-TELECOMMUNICATIONS-SETUP-SETUP *menu holds most of the variables needed for a communications session with Framework. Once the settings are correct, they can be saved in a file to which Framework automatically gives the extension* .TCM.

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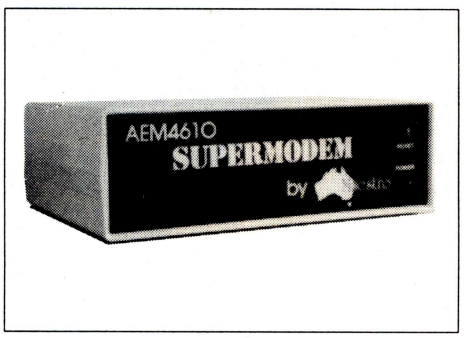

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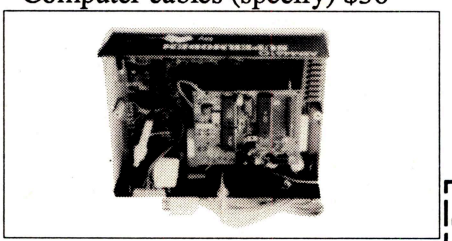

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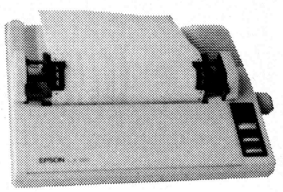

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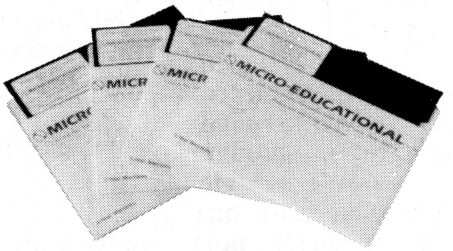

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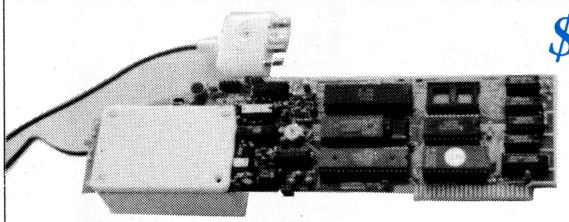

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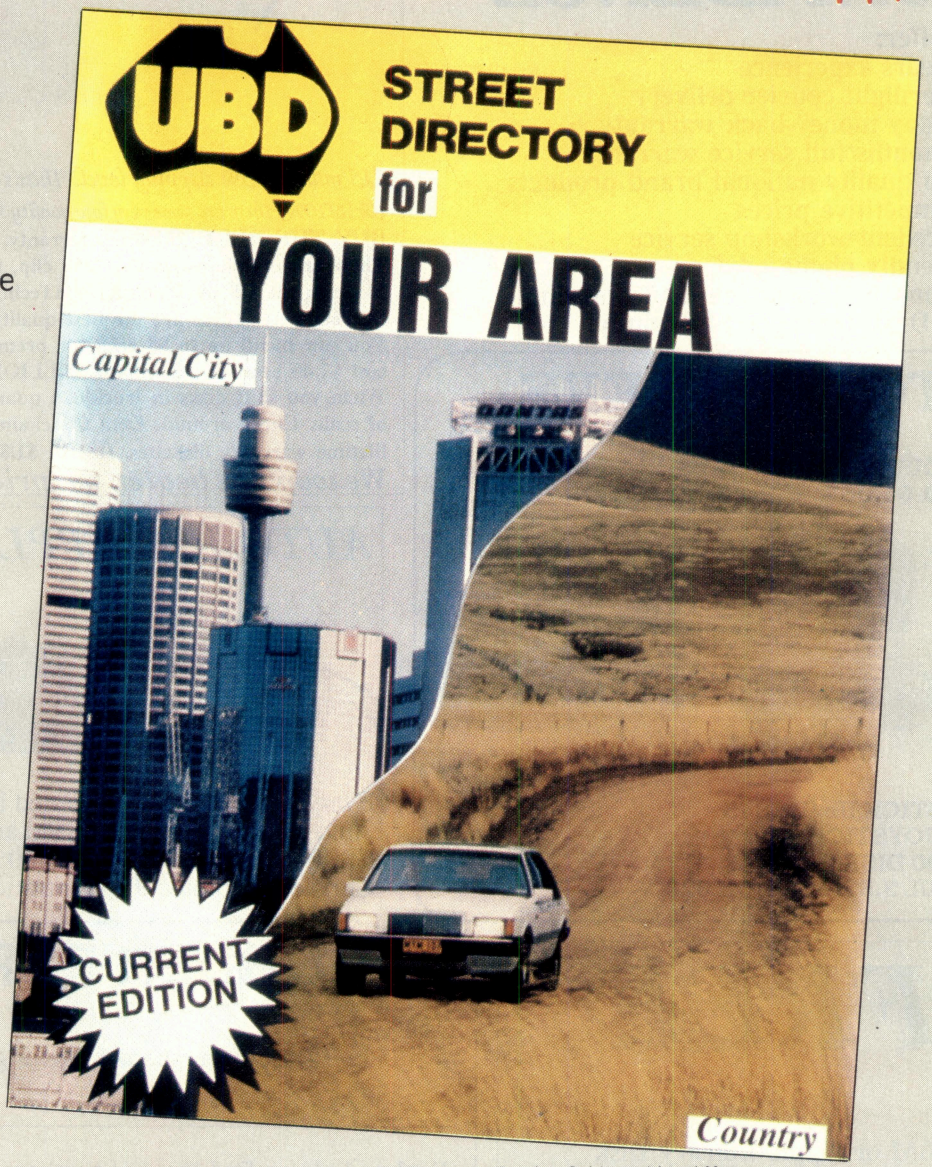

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RIGHT, YOU SOFTWARE junkies, it's time for your monthly fix! This month it's a double-barreled package called FindDupe, a program of enormous use for all of us with a multitude of files and disks. As a bonus, it is also a stunning example of good Turbo Pascal programming and a library of excellent Turbo functions and procedures.

Finding Duplicate Files

Can you imagine the problems the sysop of a bulletin board has in finding duplicate files in different directories on a hard disk? I find it's bad enough with only one 20 Mbyte unit! Imagine the problems for a system with 9 hard disks on line, each of them a 32 Mbyte. Such a system actually exists, and the problems of running it were part of the reasons behind the latest edition of FindDupe. The same problem, from a different perspective, occurs to the rest of us with modest hard disks and a plethora of floppies.

The solution is a program called FindDupe. In its current version of 3.02 it is named FINDUP32.

FINDUP32 Functions

FINDUP32 is a directory utility program which reads information from multiple drives, or from multiple floppy disks in sequence. It then sorts the directory information and displays, prints or writes the sorted information to disk.

The Findup options are —

- List all files where the name is duplicated on different drives, directories, or floppies;
- List all files in the selected drives or floppies, sorted by name;
- Do both of the above simultaneously (with this option screen and printer output is not possible so all output is to disk); and
- List all file names in 'tree' sequence, first in drive order, and then, for each drive, give an alphabetical listing of files, one directory at a time.

Running FINDUP32

First, extract the various component files from the distribution file, FINDUP32.ARC, by using ARC.EXE in the usual way. Now, typing FINDUP32 at the DOS prompt runs the program. If no drives are selected from the command line, only the default drive is searched. Multiple drives can be searched by listing their drive letters on the command line, and FINDUP32 ADF would search drives A, D and F.

If librarians for other user groups could send me catalogs of their public domain libraries, including software costs, and the time, place and manner of distribution, I can advise readers in a future column.

Then, an opening screen appears and the user is offered four options. These are to 1) list duplicates, 2) list a directory of all files on disk, 3) list both duplicates and all files, or 4) list a sorted tree directory.

A window then pops up to ask the user if the disk to be read is a floppy or hard disk. If a floppy is to be read, the volume label for that disk is displayed and the user can change it if required. After reading the directory of the floppy, the user is prompted to change floppies and continue the process for multiple floppy disks.

While FINDUP32 is reading and sorting the directory information by file name, the drive and directory being read are displayed and a line of dots slowly grows across the screen, indicating that the program is running and hasn't locked up or gone to sleep.

If required, a temporary disk file is made during the sort. This can become quite large. The documentation indicates that after reading 10,000 files a 800 Kbyte file is required for the sort!

Output Options

Where the users asked for a listing of duplicates plus a listing of all files, output is made only to disk. Two files are created, called DUPLICAT.DTA for the duplicates and DIRECTORY.DTA for the full sorted listing. Both are written to the default drive and directory.

If listing of duplicates, or of all files, or of a tree directory was selected, another window pops up on completion of the sort. It asks if output is to be to printer, screen or disk. Output to disk is made to DUPLICAT.DTA or DIRECTORY.DTA, as appropriate, which will still be on the default drive and directory.

Output Format

Output to screen pauses after each screen is filled, and then displays another screen when a key is pressed. Output to paper or disk is formatted for 66 line paper. At the top of each screen or page is shown the date and time, and the page number. Also shown are the column headings and the legend for the codes which indicate if a file is a directory entry, hidden, read only or system.

The name of each file is shown in a column, sorted according to the user's choice. When searching for duplicates a blank line is provided between one group of like names and the next. To the left of the name appears a * for a directory entry, while R, H or S in the same place indicates read only, hidden or system.

Also shown for each file is its creation date and time, its file size in bytes, and its location. On hard disks, the location is drive plus directory information — a file on the C drive in a QBASIC subdirectory beneath a COMPILE subdirectory would be shown as C: COMPILE QBASIC. With floppies, the drive letter is replaced by a number determined by the order in which disks were read, for example, the fifth disk read would be shown as 5: on the screen.

Compiling FINDUP32

The latest version of the program is 3.2, and it is distributed as FINDUP32.ARC, containing four component files — FINDUP32.COM is the executable program, FINDUP32.PAS is the source code in Turbo Pascal 3.0, and FINDUP32.DOC, the documentation. Also in FINDUP32.ARC is WINDO.INC, an include file containing windowing routines, which is required to compile the source code.

Users planning to modify and recompile the code will need a copy of SORT.BOX, the quicksort include file found in Borland's Turbo Database Toolbox. Compilation isn't necessary unless modifications are planned since FINDUP32.COM is on the disk and ready to run.

FINDUP32.PAS is very generously commented, and well structured, and contains no less than 25 pages of code. WINDO.INC file is another 7 pages long. In both cases, essential documentation is included as enormous comments at the start of the program listings.

Functions and Procedures

For a program like this to work, it must be able to read the directory information for each file, including name, size, creation date and time. The disk volume label is

also required to be read and written, plus the system date and time obtained. None of these internal functions of Turbo Pascal, but users should be able to cobble individual functions and procedures from FINDUP32.PAS into their own programs.

As a bonus, users will find the windowing routines in WINDO.INC invaluable.

Performance

FINDUP32 is a fast and efficient program with no apparent major bugs. Only minor criticisms can be made about the aesthetics of some of the screen displays, and I had some minor problems in formatting output for a file with a creation date after the year 2000! No problems of substance were found in testing, though.

The documentation indicates that it can read directory information from a large number of logical drives as might be found on a Lan. But, it warns, this can cause some deterioration in Lan performance during the reading. This aspect was not examined.

I have already found this program *essential*. On my hard disk I have a UTILITY subdirectory, and a PATH always points to it. FINDUP32 has joined the other vital utility programs in that UTILITY subdirectory!

Availability

FINDUP32 is a product of Karson W Morrison, RD1, Box 532, Ringoes NJ, 08551, USA. WINDO.INC was originally written by Michael Covington, but has been modified by Lane Ferris and Lynn Canning. Distribution of each is freely allowed, and no fee may be charged for them.

It's a pleasant surprise to find the source code with the programs, and that a system for user modifications is set up in the 'official' version.

As you may have gathered, I like the package. The inclusion of source code and the generosity of its authors in making it freely available and not even requesting a donation is commendable. A copy of FINDUP32.ARC is on the YC bulletin board.

Library Catalog

Like most User Groups, the Sydney PC User Group has an enormous catalog of Public Domain software. The Group's catalog is on disk, and has grown till it fills five disks. The catalog lists the files on each disk in ASCII files that can be read with a word processor, and briefly describes each one. If you're interested, the price is $25, plus $4 postage from the group at Box 5010 GPO, Sydney 2001.

Public Domain Software can also be purchased at the regular monthly meetings on the fourth Monday of each month at the Masonic Centre at the corner of Castlereagh St and Goulburn St, Sydney.

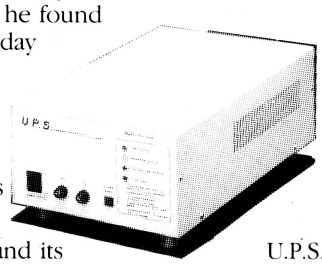
If librarians for other user groups could send me catalogs of their public domain libraries, including software costs, and the time, place and manner of distribution, I can advise readers in a future column. □

Do You Sometimes Feel Like Joe . . .

Joe's got a real problem. Last week his keyboard just hung-up on him and this morning he found that the files he was working on yesterday were somehow corrupted.

He works in a busy office, full of typewriters, photocopiers and other automated office equipment.
But there's another type of noise in his office that he doesn't know about.

Joe's office is also electrically noisy and its this electrical noise in the form of power surges and spikes caused by the use of office machines that disrupts Joe's computer equipment.



So he's had enough. Joe's investing in an Uninterruptable Power Supply (U.P.S.). His friend recommended "Perfect" U.P.S.'s. Starting at $625, they can switch-in within 4 milli-secs of the power disruption and provide up to 30 minutes of protection at full load.

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EMONA
COMPUTERS & PERIPHERALS

ALTHOUGH THE MACINTOSH II is undoubtedly the more exciting of the new Apple releases, the redesigned Mac SE will probably be Apple's big seller in 1987. This is partly because of the cost of the Mac II and also because the open architecture machine won't be available until the middle of the year — at the earliest. But also because the Mac SE is more than 'good enough' for most applications.

The joke at the Los Angeles AppleWorld release was that SE stood for 'Slightly Enhanced', but Apple maintain it means 'System Expansion'. With the limited amount of time I've had to play with the new machines, I would guess that the SE shows an order of improvement about equivalent to the jumps we've seen from the Mac in the past — from the first 128K model to the Fat Mac, then from the Fat Mac to the Mac Plus.

At first glance the SE looks like a touched up version of the Mac Plus. The old dowdy beige colour has gone and been replaced by 'platinum'. But the changes aren't just cosmetic.

Like the Mac Plus, the SE comes with a standard 1 Mbyte of memory on four SIMM (Single Inline Memory Module) boards filled with 256 kilobit chips. You can increase the memory to 2.5 or 4 Mbytes by replacing the SIMMs with 1 Mbit chips.

Hard Disk

We've seen hard disks built-in to the Mac before, but this is the first time that one has been sourced from Apple. The model I had to play with carried a SCSI 20 Mbyte hard disk plus one internal 3½ inch 800K floppy drive. The hard drive is a completely self contained unit that is highly shock-proof, so you don't have any worries about using your Mac as a luggable/portable.

When you look inside the Mac SE, you can see where the development effort has gone. Apple has reduced component numbers by grouping items together on VSLI chips. The analogue board is still on the right hand side of the case, and the logic board on the bottom. You can slide out the logic board to add memory or plug-in an expansion card.

The logic board contains one new VSLI chip which replaces 19 different chips in the Mac Plus, and this compression of components has given them room for the expansion slot and space for a changeable card port behind.

Add-in boards will obviously fall into three main categories —

- Communications — cards for network connections, terminal emulation and instrument control;
- Co-processors and accelerators — MS-DOS cards and Mac II (68020 chip) cards;
- Video adaptors — mainly for the large screens now available.

You can't use any NuBus card now being made for the Mac II on the SE; it requires a special SE-Bus card.

Most interest has centred around the MS-DOS cards for both the Mac SE and the II. AST Research has made co-processor cards for both of the new machines, but they are quite different. The Mac86 card for the SE lets you run MS-DOS applications in a window on the Macintosh at the speed of an IBM PC-XT. It uses an Intel 8086 microprocessor, and shares the Mac's own system memory.

The Mac286

The Mac286 for the Mac II runs a 80286 chip and emulates the IBM PC-AT. It has its own 1 Mbyte of on-board RAM.

To the user, the MS-DOS application will appear in a Mac window, and will run just the same as if it were on the screen of an MS-DOS machine. Many important Mac features remain available to MS-DOS applications, however. You can copy and paste between environments, access Mac desk accessories, and share Mac peripherals (such as LaserWriter or disk drives).

Moreover you can install copy-protected MS-DOS applications on the internal hard-disk, save MS-DOS data to disk and then integrate this with other files using Macintosh applications. All the normal keyboard functions are available through the Apple Keyboard, the Extended Keyboard, or from pull down menus.

Apple have also released an external MS-DOS 5¼ inch floppy drive, and with this drive and the co-processor card you can run Lotus 1-2-3, dBase II and WordStar if that's what turns you on. The Mac86 card has the drive controller on-board, and if you MS-DOS application was designed to run with the Microsoft mouse, then full emulation is provided.

I'm telling you all this because it's interesting — but I must admit that I haven't had a chance to play around with MS-DOS on a Mac SE yet. The Mac86 card won't be available until later this year, and it'll cost around $1000 in Australia.

If you only want to transfer MS-DOS data and don't need to run applications, Apple are introducing InterFile file transfer software. You'll also need a 5¼ inch drive and controller card.

The Mac SE also has gained extra expansion capability (of a sort) through the use of the Apple Desktop Bus for the mouse and keyboard. Apple introduced this input bus system with the Apple GS, and so it is not surprising to find that one of the new keyboards for the Mac is identical to that on the GS.

The Desktop Bus allows you to connect up to 16 devices — mouse, keyboard, graphics tablets, and so on — to the SE. The mouse plugs into the back as before or to either side of the keyboard (which is a boon for left-handers).

The standard keyboard has a good feel and excellent layout, although I found the space bar to be too short. I would have to modify my typing habits if I were to use this machine regularly. I must admit that I've never really liked the old Mac Plus keyboard, but this new one is flatter, and the keys feel much crisper when you type.

The second Apple keyboard available is for those of you who will run MS-DOS regularly. This is the 'Extended Keyboard' with function keys across the top and a separate set of arrow keys. The keyboards are packaged and sold separately.

The most notable differences between the Mac Plus and the Mac SE are speed and noise. Because of the hard disk and a heavier-duty power supply, Apple have added a fan. And although this can't be characterised as noisy, it is noticeable when you are used to a perfectly silent machine. I hadn't realised before how silent the Mac was when compared with the constant humming of fans on the MS-DOS machines.

Greater Speed

The speed improvement of the SE is of two types. The internal hard disk unit is much faster than anything we've seen before in a Mac — and probably much faster than most other PCs on the market. Apple have changed the communications links between the Mac and its SCSI devices by using hardware rather than software to check the connections before data is transmitted. This has virtually doubled the speed of access in most cases.

The second speed improvement has come from the use of VSLI chips. In the old Mac the processing chip had to alternate between system and video processing, but now a custom VSLI chip updates

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the video twice as fast. This cuts the load from the 68000 processor and gives you a 15-20% performance improvement even though the chip is still running at the old speed of 7.83 MHz. When playing with the machine, the speed improvement was most noticeable (as you would expect) when recalculating spreadsheets.

No Upgrade!

On a more negative note, it is a pity that Apple haven't been able to offer an SE upgrade for Mac Plus users. Apple have historically been very sensitive to supporting previous buyers, and they've always tried to offer an upgrade from the last model to the new.

If you've just bought a Mac Plus, the introduction of the SE probably doesn't matter for the present, but inevitably new software will come on the market which won't be usable on the Plus.

According to Jean-Louis Gassee, vice president of product development at Apple, an upgrade path was impossible. 'There was too much of a change in the design. We redid everything in the computer but the CRT, and so we had to choose between compromise and an upgrade in power.' he said. I guess he knows what he's talking about!

However all Mac applications written to date should run on the Mac SE, 'as long as the software followed the strict rules layed down by Apple'. This is now becoming a rather hackneyed old disclaimer; the problem is that most software writers take short-cuts, and everybody knows this. So a complete redesign to the level of the SE could mean new bugs in old software.

Gassee also agrees that there will be problems with the downward compatibility of software written for the Mac II 'if these programs take advantage of special features like the II's colour capability, new sound chip or 68881 math co-processor'. I would hope that most of them do — otherwise what's the point of having the Mac II at all. □

RIP'S *Poems* XI

PDP had their eight elevened,
And IBM's 360 was sevened.
The 4040 8080'd,
Everyone was escalated.
Soon I'll hear someone yellin'
That Apple's now Water Melon.

— RLP

Composing graphic messages online can be time consuming, so I put a big capture buffer into the terminal. You can compose to your heart's content, save it to disk, and when online, the press of a single key will upload the entire precomposed message.

Telecomputing

A COUPLE OF YEARS AGO I came across a short terminal program called RTERM. I was told you had to use it if you wanted to log onto a new bulletin board that was specifically for Commodores. At the time it seemed a little strange — why would you need a special terminal? I was curious, so I loaded up RTERM and logged onto the new board. I came across something I'd never encountered from a bulletin board.

My screen suddenly changed from blue to black and I saw a message print out in full coloured letters. 'Welcome to RCOM' it said, but the letters RCOM were constructed out of the CBM keyboard graphics shapes and printed in reverse. I was impressed — here we had a bulletin board that supported colour and graphics, and that was the reason for the special terminal program. The colour and graphics were possible only because RCOM was using Commodore ASCII instead of standard ASCII.

Now standard ASCII has one big advantage; like it's name implies it's a 'standard'. All makes of computer understand it, and it's the only way to go if you need to talk to the whole world. But what if you didn't necessarily want to talk to the whole world? French and English may be the standard international languages of diplomacy, but nobody suggests that the Germans or Japanese shouldn't stick to their native languages when talking to each other! In this country we have over 30 Commodore specific bulletin boards and 99 per cent of their traffic is coming from CBM users, but hardly any of them support 'native' Commodore ASCII.

At first sight that may seem a little odd, but if you think about it, it's really just a quirk of history. In the early days of telecomputing modem owners were fairly rare. If you didn't use standard ASCII you'd have an extremely limited audience. It followed from this that all of the early bulletin board software was written to support standard ASCII. That in turn meant that the terminal software that was written for Commodore users also supported standard ASCII.

It became a bit like the chicken and the egg: there was no point in developing a CBM ASCII bulletin board if there are no CBM ASCII terminals, and there was no point in writing a terminal unless there were BBS's that supported the feature. And so it goes, the end result is that we still seem to be stuck with standard ASCII, even if we are talking Commodore to Commodore.

Talking Commodore

Anyway, after a little thought I decided it might be fun to see if that vicious circle might be broken. I got in touch with the sysop of RCOM, a chap called Simon Finch, and we formed a sort of partnership — he would write the software for a CBM ASCII bulletin board and I would develop a 'smart' terminal program to go with it.

It didn't take long before we realised that the idea had a lot of interesting possibilities. For example, the 64 has an excellent inbuilt screen editor, and the commands to drive it are embedded in CBM ASCII. This means that we could do away with the conventional line editors that most BBS's support, and give users the freedom to scroll all over the screen, insert and delete at will and even create a form of character animation! This makes for good interesting messages, as it allows creative users to build up a picture message with graphics, text and colour.

Composing graphic messages online can be time consuming, so I put a big capture buffer into the terminal. You can compose to your heart's content, save it to disk, and when online, the press of a single key will upload the entire precomposed message. This same buffer feature can be used to upload any sequential file, including just about all word-processed files. It has a two-way feature that allows you to capture incoming messages and store them to disk or print them out later.

Sound

The C-64 also has the SID synthesiser chip so we thought why not make it possible to incorporate sound into messages as well? And we did. The terminal program incorporates a mini-synthesiser which gives you full control over the sound envelope, filter, waveforms and octave settings. It can play and record tunes by using the plastic keyboard overlays or by using the keyboard.

It turned out that we needed only 58 bytes to send all of the compressed information to play a 16-note tune! This tune can be sent as part of a message so that the receivers end will be playing music while the text of your message is reading out on the screen. You can also save to disk, tunes that you've received.

This month, something special: A Bulletin Board with full colour and sound — plus, an interview with Tom Rattigan on the future of Commodore.

What we really needed was a file transfer protocol and we were on the point of adopting Xmodem when we came across a public domain program called Midwesterm. It's transfer protocol was very clever, sending the entire 253 bytes of a disk block plus 2 checksum bytes in one hit. It saved to disk as it went, so there was no limit on the size of the file it could handle (other than disk capacity).

In our view, the Midwesterm protocols were far superior to Xmodem so we adopted them as our standard. (One of the few joys of venturing into unchartered waters is that you can define your own standards.)

The original terminal program was called Ultraterm and it was put in the public domain so as many people as possible could get to use it. It's been through various revisions and improvements and the latest version is Ultraterm V.4. You should be able to find it in the downloads libraries of most CBM bulletin boards. By the

The 64 has an excellent inbuilt screen editor, and the commands to drive it are embedded in CBM ASCII. This means that we could do away with the conventional line editors that most BBS's support, and give users the freedom to scroll all over the screen, insert and delete at will and even create a form of character animation!

Colour, text and graphics like that shown on these screens from the RCOM Bulletin Board *are possible using Commodore* ASCII, *as opposed to 'standard'* ASCII. *The terminal program incorporates a mini-synthesiser, making it possible to include sound as part of the message — even a form of animation is supported on the Board!*

time you read this there will also be a special commercial version which is a sort of all-in-one type terminal, supporting CBM ASCII plus the mundane, standard ASCII.

As well as Midwesterm, it will work with both Xmodem and New Punter file transfer protocols. The idea is to build one terminal that can adapt to work with any and every BBS. It's called Ultraterm Palette and supports 1200/75 and 75/1200 as well as 300/300 and 1200/1200 and will retail for around $30.00, but that's another story.

Meanwhile two other CBM ASCII BBS's have sprung up. One is Comet and the other Manly. Like RCOM, they are the product of sysops writing their own original software, but you can still log onto them with Ultraterm. If you've been following Larry Lewis's *Your Computer* series on developing your own BBS, you will know that the first rule is to look around at the possibilities.

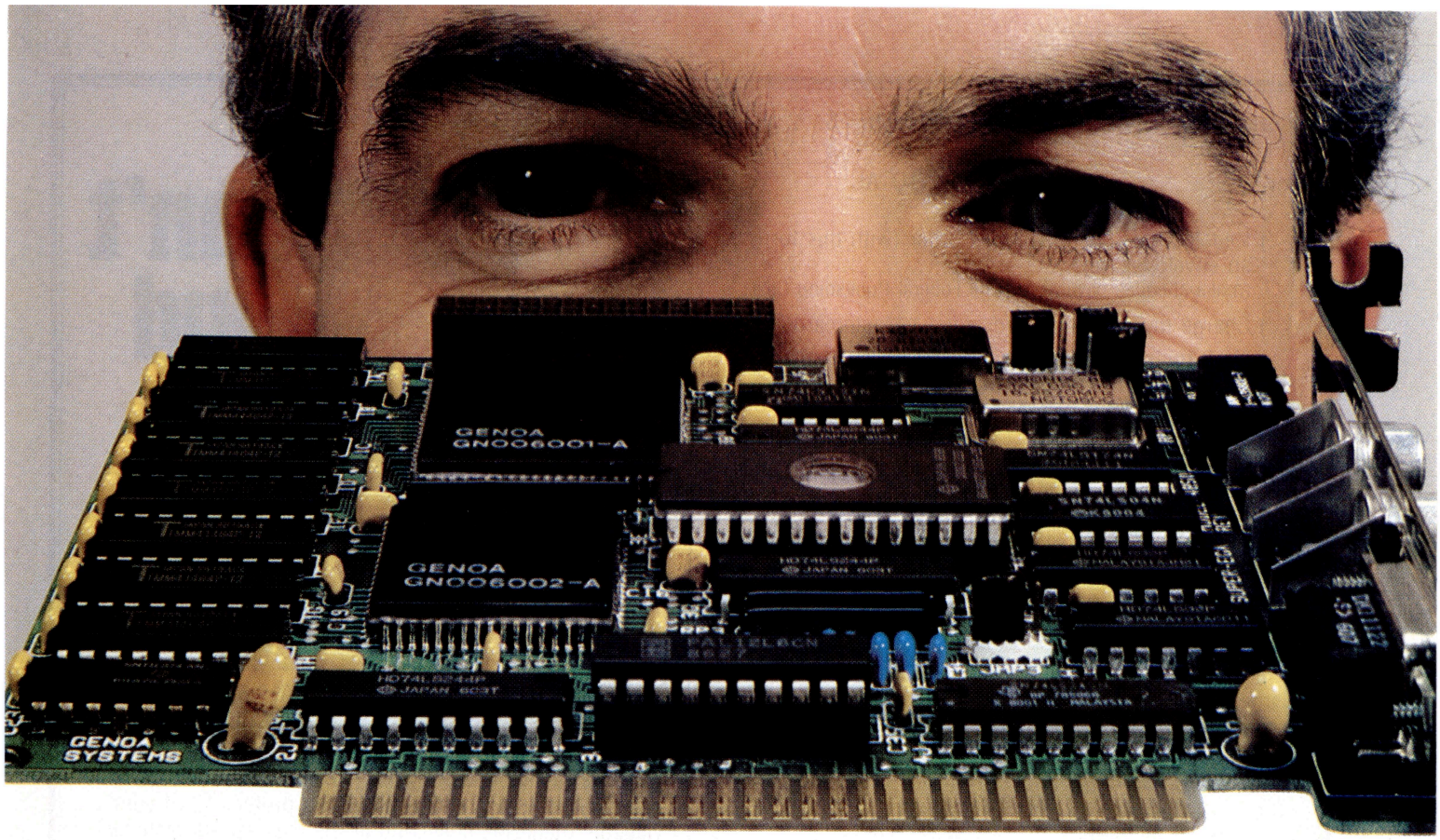
Get a copy of Ultraterm and log onto these CBM ASCII boards and see for yourself. The only tricky part about the Ultraterm compatible board is the receiving message function. It really needs to be done in machine language, but I'm happy to pass on the code gratis to anybody who is interested. I can be contacted on RCOM (02) 667 1930 or by writing to RCOM Telecomputing, PO Box 410, Mascot NSW 2020. Comet BBS is (02) 599 7342. Manly BBS is (02) 977 6820.

There are somewhere between six and seven million C-64 compatible computers in the world and at least 400,000 in Australia. Standard ASCII will always be useful for communicating with other non-CBM systems, but I think it's way past time we learnt to telecompute in our own language as well!

The Future (According to Tom Rattigan)

DESPITE THE FACT THAT I own one, I've always had a soft spot for Commodore. Perhaps I'm still a bit of a romantic, but I really believe that Commodore, more than any other company, was responsible for making personal computers accessible to everybody.

We've all heard about the upheavals at Commodore. Company founder Jack



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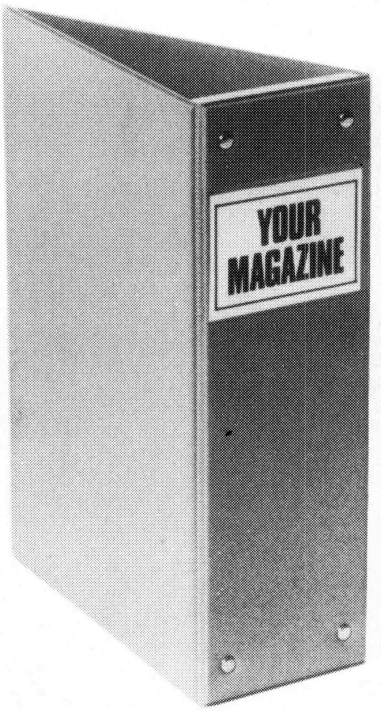

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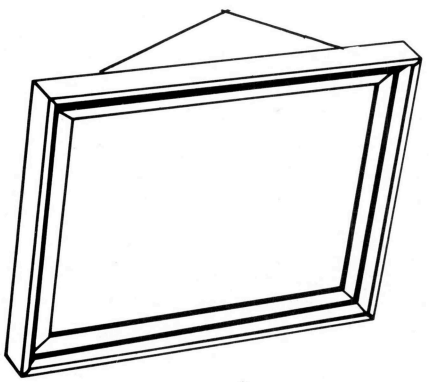

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As Rattigan sees it, the way to sell the new Amiga/Macintosh/AT generation of computers is to have dealers. K-Mart may be perfectly suitable for C-64's, but sophisticated computers need proper dealer support.

Tramiel resigned and moved on to take over Atari. The company was severly affected by the market downturn — actually not so much a downturn, more the market's failure to keep growing exponentially. In such conditions the manufacturers with the lowest margins were hit first, it's an occupational hazard of taking that road. Now Commodore seem to have traded themselves back into the black and the launch of the new Amiga and PC lineup represents a renewed sense of confidence and direction for the company.

They are so sure of themselves that they brought out Commodore's supremo boss Tom Rattigan for the Australian launch. He was impressive in giving a no-nonsense, down to earth portrayal of where the company is at, and where it is going. In essence the plan is simple: Commodore is staking it's future on the Amiga, that's nothing new, but the new releases define a strategy which is extremely clever. Let me explain —

As Rattigan sees it, the way to sell the new Amiga/Macintosh/AT generation of computers is to have dealers. K-Mart may be perfectly suitable for C-64's, but sophisticated computers need proper dealer support. Dealers can't provide this support unless they have sufficient profit margins. The only way dealers can preserve profit margins is if they have a product with unique characteristics, in other words one that is uniquely suited to a particular application. The desktop publishing abilities of the Apple Macintosh, was the example he quoted.

The IBM world is already seeing the clone cost-cutting war. There is little differentiation among the clones or the IBM's they emulate apart from price and reputation. IBM has the reputation, but it is being severely hurt by compatibles competing on price. This is not a sustainable situation because dealers margins end up cut to the point of unviability. Will we soon see clones in K-Mart? It can't be far off.

Alternatively, Apple dealers have not had to engage in this war. An Apple Macintosh is something different and proprietary software and chips means that so far there are no significant clones. The dealer margins have been maintained. And this happy state of affairs is only possible because the Mac is a unique, rather than a generic, product.

So Commodore's new strategy involves providing it's Amiga dealers with a sustainable margin, but is that enough? What's so unique about the Amiga? Sure, it's a very technically advanced computer with superb graphic capabilities, but what can you do with it that can't be done on a Mac? The answer, of course, depends upon the software.

Many people argue that the software to support desktop publishing saved Apple's fortunes with the Mac. I've heard the same argument put about Visicalc for the Apple II. It's is worth noting that both Visicalc and desktop publishing did not originate from Apple, but rather from third party software suppliers.

The Amiga needs an equivalent breakthrough if it is to carve a niche for itself, but no software developer is going to invest the time and money unless there is a reasonable market, and in software terms that comes down to the numbers of units that have been sold. This brings us to the key element in Commodore's strategy — the Amiga 500.

Commodore are offering this computer with built in disk drive and 512 Kbyte of RAM for the amazing price of A$999 — yes Australian dollars!. It comes without a monitor, but even if you add an extra $500 for a top of the line colour job, it still looks like exceptional value.

The Amiga 500 is clearly targetted at the home and educational markets, and there is nothing of comparable power anywhere in this price range. Commodore's own 128D with built in disk drive and no monitor sells for $1199 (rrp). The C-64 costs $499 plus a disk drive at $399 or $898 together (but without monitor).

At it's price the Amiga 500 has to be the coming shape of home computing! Even though it's got a couple of limitations: It can't interface with a TV unless you buy an extra card for it, and it's expansion possibilities are limited to just 1 Mbyte! (Who's complaining?).

I bought my first C-64 back in the days when a dollar was worth a dollar. It cost me $799 and there was no disk drive. I was strictly a novice at the time, but I was very impressed with the C-64's graphics and sound. The Amiga's graphics and sound have to be seen to be believed. My feeling is that it will wow first time computer buyers in much the same way that the C-64 did. It's graphics alone will convince. I don't know about other C-64/128 owners, but personally, I'm not about to upgrade as I have too much invested in my present system and it does everything I want it to.

The point about the home market is sheer volume. There is barely a software title (or it's equivalent) that isn't available for the C-64, and the prices are one-half to one-third those paid by Apple or IBM users. If the Amiga 500 can captivate a similar market, it will ensure the development of a large pool of software, and software is what it is all about. You see the second string to Commodore's Amiga push is the Amiga 2000. This is a high end computer, and probably where the sustainable dealer margin is, (but still cheap compared to a Mac).

It is open architecture, with plenty of slots for expansion cards. It can be made to emulate an IBM AT, and share the hard disk with Amiga Dos at the same time. It's a computer with lot's of flexibility and up to 9 Mbytes of RAM, plus those superb colour graphics. It's also price at a reasonable $2999, so it's in the business market.

CBM have taken advantage of what Rattigan calls a 'target of opportunity' and released IBM clones that cater to both the low end and high end PC users. The PC5 for $1499 and the PC40 AT lookalike at $5999. If Commodore is so efficient at manufacturing that dealers still have a margin at those prices, then their grand plan must be looking good.

From a philosophical point of view, if Commodore pulls off the grand plan it will be a form of poetic justice. They began in the business before Apple, or IBM, they alone, among the pioneers, embraced the difficult low-margin high volume market, and because of that they suffered the first wave of setback in the market. If the fruit of those lessons sees them re-emerge competitively with good products and good strategy, then maybe there is more than one road to Rome. □

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ONE OF THE MAINSTAYS of the micro computer world, starting long before IBM joined that particular scene, was dBase II. Available on almost any micro, from CP/M to MS-DOS and PC-DOS, dBase II became the standard database by which all others were judged.

Innumerable businesses have data in dBase files — sometimes it's necessary to take that data and read it into a format that can be read by another application. A number of database packages that were designed to compete with dBase II, provide translate utilities to convert from dBase to the package's format. For example, Lotus (albeit a spreadsheet) provides just such a utility to take data from a .DBF file and load it into a Lotus file. But many packages don't have such a utility.

Translating dBase Files

Probably the most common need to translate a dBase file arises when names and addresses are in a dBase .DBF file, and these are wanted for form letters created with a word processor of some description. Typically, it is necessary to translate the .DBF file into a MailMerge format file which can be read by the word processor. Two very common word processors which read MailMerge files are Wordstar (naturally), and Microsoft Word. Many other packages, of just about every type, can read MailMerge files but not dBase files.

The MailMerge format is also referred to by two other names which indicate just how universal a data file format it really is. It's sometimes called the Basic Sequential File format since it can be read by programs written in Microsoft Basic (including BASICA), and sometimes it's called an ASCII file with comma and quote delimiters.

Using dBase II

Creation of a 'comma and quote' delimited file is a snack if you have access to a copy of dBase II. (Here, I will concentrate on dBase II and not III — while the details may vary, the principles are similar.) Simply enter dBase from DOS, and then the following will give the new file —

```
A> DBASE
. USE dbasefil
. COPY TO mmfile DELIMITED WITH "
. QUIT
A>
```

This will create a file mmfile.TXT. Character fields, which naturally contain strings, will look like ....,"Typical string", ... and numeric fields will look like ...,1234,

Not to worry — with this column you'll find a program written in interpreter BASIC which can read a dBase II file and write a Mailmerge file from it. It can also be compiled with QuickBasic as long as the /E switch is invoked to enable error handling.

No dBase?

What if you have a dBase file, possibly sent to you from another state, and you don't have a copy of dBase to convert it; furthermore, your target application doesn't have a utility to translate from dBase to the native format?

Not to worry — with this column you'll find a program written in interpreter BASIC which can read a dBase II file and write a Mailmerge file from it. It can also be compiled with QuickBasic as long as the /E switch is invoked to enable error handling.

Run the interpreter version by typing BASICA DB2MM from DOS; or, run the compiled version by typing DB2MM from DOS. The program will ask for the name of the input and output file and no other action is required of the user, except that if the source file cannot be found a second choice will be requested. If a target file of the same name exists you won't be able to overwrite it.

As written, DB2MM surrounds both character and numeric fields in the dBase II file with commas and quotes in the MailMerge file. As we discuss the program you will learn something of the structure of a dBase II data file, and how to determine if a field is numeric. An exercise for you will then be to modify DB2MM.BAS to recognise a numeric field and not write the " at each end. A further exercise will be to modify it to read a dBase III file, which is similar in principle to a dBase II file but with significant difference in detail.

THE dBase II HEADER

A dBase II file consists of a 521 byte header, numbered in Ashton Tate terminology from byte 0 to byte 520. The records immediately follow the header in the same file.

Byte 0 of the header indicates if the file is dBase II or dBase III. Bytes 1 and 2 are the number of records in the file, bytes 3 to 5 is the date of last update, and bytes 6 and 7 indicate the size of each record.

DB2MM

A program to read dBase II files and write files with comma and quote delimiters between fields and carriage return/line feeds after each record.

The output format is more commonly called MailMerge format.

Before processing an important .DBF file (the dBase II data file), make a copy of it on a separate disk. Run the .EXE file by typing DB2MM at the DOS prompt.

When the program asks you, enter the names of the file to read and write.

The program will not go on if the .DBF file does not exist, and will not overwrite an existing file.

This program is Public Domain and may be freely copied and shared. It must not be included on any disk for which any fee or price is charged, with the exception of user Groups which may charge a copying fee which does not exceed $10 for the entire disk.

John Hepworth,
Sydney, Australia,
April 1987.

```
10 CLS:KEY OFF
20 GOSUB 2500
30 FOR I = 1 TO 8
40    LOCATE 8+I,20
50    READ MESSAGE$
60    PRINT MESSAGE$;
70 NEXT I
80 GOTO 170
90  DATA "*********************************"
100 DATA "*                               *"
110 DATA "*   dBASE II to MailMerge       *"
120 DATA "*                               *"
130 DATA "*   Copyright John Hepworth,    *"
140 DATA "*     Sydney, NSW, 1987         *"
150 DATA "*                               *"
160 DATA "*********************************"
170 FOR N = 1 TO 1000 : NEXT N
180 REM
190 REM *********************************
200 REM Get name of .DBF file to be read
210 REM *********************************
220 REM
230 REM
240 CLS : LOCATE 10,5 : FILES"*.dbf"
250 PRINT:PRINT SPACE$(20);
260 LOCATE 25
270 PRINT "Read from which dBASE II file";
280 INPUT INPUTFILE$
290 P = INSTR(INPUTFILE$,".")
300 IF P=0 THEN INPUTFILE$ = INPUTFILE$ +
    ".dbf"
310 ON ERROR GOTO 340
320 OPEN INPUTFILE$ FOR INPUT AS #1
330 ON ERROR GOTO 0 : CLOSE :GOTO 540
340 PRINT INPUTFILE$; " does not exist"
350 CLOSE: RESUME 260
360 REM
500 REM *********************************
510 REM Get name of output file
520 REM *********************************
530 REM
540 PRINT : PRINT SPACE$(20);
550 LOCATE 5,5
560 PRINT "Write which Mailmerge file";
570 INPUT OUTPUTFILE$
580 ON ERROR GOTO 620
590 OPEN OUTPUTFILE$ FOR INPUT AS #1
600 PRINT OUTPUTFILE$;" already exists"
610 CLOSE: GOTO 540
620 CLOSE:RESUME 630
630 ON ERROR GOTO 0
640 REM
1000 REM *********************************
1010 REM read dBASE II file header
1020 REM *********************************
1030 REM
1040 DIM FIELDINFO$(32)
1050 DIM FIELDNAME$(32)
1060 DIM FIELDLENGTH%(32)
1070 OPEN INPUTFILE$ FOR INPUT AS # 1
1080 OPEN OUTPUTFILE$ FOR OUTPUT AS #2
1090 REM
1100 HEADERINFO$ = INPUT$ (8,1)
1110 BYTE2$ = MID$(HEADERINFO$,2,1)
1120 BYTE3$ = MID$(HEADERINFO$,3,1)
1130 RECORDS% = ASC(BYTE2$) + 256*ASC(BYTE3$)
1140 MAXFIELDS% = 0
1150 FOR I = 1 TO 32
1160    FIELDINFO$(I) = INPUT$(16,1)
1170    FIELDNAME$(I) =
          LEFT$(FIELDINFO$(I),11)
1180    FIELDLENGTH%(I) =
          ASC(MID$(FIELDINFO$(I),13,1))
1190    IF FIELDLENGTH%(I) >0 THEN MAXFIELDS%
          = MAXFIELDS% +1
```

Bytes 8 to 519 are 32 field descriptors, each of 16 bytes. The first 11 bytes of each field descriptor are the field name, the next byte is the field type (character, numeric or logical), the next byte is the field length, the next two bytes are the field data address, which is set in memory. The last byte of each field descriptor is the field decimal count (that is, which field number it is).

The last byte in the header indicates whether or not all 32 fields are used.

dBase II DATA

The data in the dBase file follows immediately after the header, with no delimiters of any kind between fields or records. There is one byte at the start of each record additional to the actual data, and this is the delete flag which is a space (20 H) if the record is not deleted and a * (2AH) if the record is deleted.

Sequential or Random File Handling

DB2MM.BAS reads the header information, and then using sequential file techniques, reads the data and writes it to the target file. Why not use random file handling? There are two reasons that make this difficult, but not impossible. First, different data files have different numbers and lengths of fields, which makes it difficult to read the dBase header and then automatically read the data. Also, the dBase header creates an offset into the file that conflicts with BASIC random file structures.

The necessary code to overcome these problems would make the program listing too long and complicated to fit in the magazine, and obscure other important points.

Readers who would like to investigate random access of a dBase file by a BASIC program should look at the program RDBASE.BAS in *The dBase II Guide For Small Business* by Schadewald and Dickey. This reads blocks 128 characters long from a dBase file and then splits and combines parts of one or more to recover the fields. It is very useful, but for our file conversion needs it is not necessary and would be slower and more complicated than using sequential file techniques.

DB2MM

The program shows details of a dBase II file and how to exploit them. After initialisation and a greeting message, lines 190 to 640 get the name of the input and output files. Error handling allows a second try if the input file is not found, and prevents overwriting an existing output file.

Lines 1000 to 1340 read the dBase header. First, two string arrays are created for the fieldname and field information, and an integer array for the field length. The input and output files are opened and the first eight bytes read. The second and third bytes in this string are loaded into BYTE2$ and BYTE3$, and from them the number of records is calculated.

Now a loop reads the 32 field descriptors, each of 16 bytes, then loads the field length and field name into the relevant arrays. If you want to differentiate between character, numeric and logical fields, an additional array of FIELDTYPE$ will be required, and should be filled in the same loop.

To pretty up the screen, a gosub creates a box drawing, and the field names and lengths are now displayed. Each record is then read, embedded " characters are replaced with ' characters, and the data is written to the output file. If you wish to differentiate between field types, printing the " character at each end of the numeric

I have put the program in the public domain: Copies of the source and compiled files are on the YC bulletin board in the file DB2MM.ARC. They may be freely copied and shared but must not be included on any disk for which a price is charged (except by a User Group and for a fee of $10 or less).

dLetter, the newsletter for dBase II and III users, is distributed free of charge with subscribers' copies of *Your Computer*. Regular features include dLatest (which covers updates and add-ons), dBriefing (reader's problems), dTips (usage tips), and Dear Dele (features of dBase) □

```
1200 NEXT I
1210 GOSUB 2500
1220 LOCATE 3,5 : PRINT "Field Name"
1230 LOCATE 3,18:PRINT "Field Length";
1240 LOCATE 3,45: PRINT "Field Name"
1250 LOCATE 3,58:PRINT "Field Length"
1260 FOR I = 1 TO 16
1270     IF I > MAXFIELDS% GOTO 1300
1280     LOCATE I+4,5  :
         PRINT  FIELDNAME$(I),
1290     LOCATE I+4,18 :
         PRINT  FIELDLENGTH%(I);
1300     IF I+16 > MAXFIELDS% GOTO 1330
1310     LOCATE I+4,45 :
         PRINT  FIELDNAME$(I+16),
1320     LOCATE I+4,58 :
         PRINT FIELDLENGTH%(I+16)
1330 NEXT I
1340 TEMP$ = INPUT$(1,1) :REM rea last byte
     of header
1350 REM
1500 REM ********************************
1510 REM output a file
1520 REM ********************************
1530 REM
1540 LOCATE 22,5
1550 PRINT "Writing Record        of ";
     RECORDS%;"Records";
2000 REM ********************************
2010 REM write a file in Mailmerge format
2020 REM ********************************
2030 FOR N = 1 TO RECORDS%
2040   TEMP$ = INPUT$(1,1) :
       REM read delete flag byte
2050   PRINT #2, CHR$(34);
2060   LOCATE 22,21 :   PRINT N;
2070    FOR I = 1 TO MAXFIELDS%
2080      TEMP$ = INPUT$(FIELDLENGTH%(I),1)
2090      P = INSTR(TEMP$,CHR$(34))
2100      IF P = 0 GOTO 2140
2110      TEMP$ = MID$(TEMP$,1,P-1)+"""
                +MID$(TEMP$,P+1)
2120      GOTO 2090
2130 IF LEFT$(TEMP$, 1) = " "
     AND LEN(TEMP$) > 1
     THEN TEMP$ = MID$(TEMP$,2):
     GOTO 2130
2140      PRINT #2,TEMP$;CHR$(34);
2150      IF I < MAXFIELDS%
           THEN PRINT #2, ",";CHR$(34);
2160      IF I = MAXFIELDS%
           THEN PRINT #2, ""
2170    NEXT I
2180 NEXT N
2190 CLOSE : SYSTEM :REM Exit
2500 REM ********************************
2510 REM draw box routine
2520 REM ********************************
2530 CLS
2540 UPPER = 1
2550 LOWER = 25
2560 LEFT = 1
2570 RIGHT = 79
2580 LOCATE UPPER,LEFT : PRINT CHR$(201);
2590 PRINT STRING$(RIGHT-LEFT-1,CHR$(205));
2600 LOCATE UPPER,RIGHT : PRINT CHR$(187);
2610 LOCATE LOWER,LEFT :PRINT CHR$(200);
2620 PRINT STRING$(RIGHT-LEFT-1, CHR$(205));
2630 LOCATE LOWER,RIGHT : PRINT CHR$(188);
2640  FOR N = (UPPER + 1) TO (LOWER - 1)
2650     LOCATE N,LEFT : PRINT CHR$(186);
2660     LOCATE N,RIGHT : PRINT CHR$(186);
2670 NEXT N
2680 RETURN
2690 CLOSE : CLS : SYSTEM
```

field would have to be suppressed — more of that exercise for you!

While running, the total number of records in the source file is displayed and the number of the record being processed is continuously updated.

Compiling

As mentioned before, the program runs under BASICA, but can be compiled under QuickBasic if the /E switch is used. Compiling is of little advantage if an all floppy system is used as floppy disk reads and writes are done at the same speed as the program. Using different floppies for source and target files improves this, and the combination of a hard disk and the compiled version really whips along.

References

The bible for all dBase II and III users is Ashton-Tate's *Advanced Programmer's Guide, featuring dBase II and dBase III*, available at most book shops. The newest versions also cover dBase III Plus. It's well worth getting, and is essential if you plan to modify DB2MM.BAS to read dBase III files. The other valuable reference is *The dBase II Guide for Small Business* mentioned above.

I have put the program in the public domain: copies of the source and compiled files are on the YC bulletin board in the file DB2MM.ARC. They may be freely copied and shared but must not be included on any disk for which a price is charged (except by a User Group and for a fee of $10 or less).

Have fun with dB2MM, but please make a copy of any data file on a different disk before processing, just as you should before making changes to any vital file with any other software. □

RIP'S *Poems* IX

Always learning in this game.
I've forgotten a lot,
word marks and things like that, all
useless now.
Been at it for years.
First machine I used was an MCMVIX.
Papyrus tape, character set of
illuminated letters,
documented on two tablets of stone,
with a real time pendulum clock.

— R L P

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MANY THANKS TO the South Australian Microbee Users Group for sending me their newsletter — the first to arrive! It is excellent example, practical and well written.

16-bit vs 8-bit

The South Australian *Microbee News* editor, Stephen Frawley, says he thinks Microbee Systems face an uphill battle to convince users to buy a Microbee when IBM clones can be got for the same price or less. I agree.

But I am sure the only way for Microbee Systems to overcome this is by continuing to develop speedy, versatile and very friendly systems with a good upgrade policy to help them protect their position in the educational market which they have already acquired.

Their decision to package with their machines at no extra cost their new word-processor, 'Simply Write,' should certainly help. It shows that 8-bit software can rival in appearance and friendliness anything available for the IBM family of clones.

They are also following the lead established by members of user groups — and pushing the memory of the machines up. The latest model has now 256K and Microbee could well decide to push later models up to a megabyte. The technology is all there.

The decision to abandon the Gamma (for the moment?) could be wise given the difficulties the Amiga has had in establishing itself. The two to three thousand dollar market is much too expensive for many users.

Microbee seems to have decided to keep on targetting the simpler uses of computers — which includes, after all, most of the uses people put them too.

I look forward, nonetheless, to the development of the Simply Write word-processor into a fully featured professional program. It has got the basics very right — but it needs the addition of mail-merge and a spelling checker — and some enhancements to its block management. I know WordStar is available — but Simply Write is so attractive with its fonts, on-screen italics and bold, page zoom and word count, that it is a shame to have to abandon these features to go to WordStar.

Mind you, WordStar zips along on my Microbee. I have both the 128K 8-bit Microbee (with a 512K memory transplant) and the Microbee Mitac IBM clone. I still use the 8-bit machine in preference. It is much much faster, easier to use and more efficient than the clone. I've demonstrated this to doubting friends numerous times. It is my normal word-processing machine. I run WordStar in a jazzed up and *made*-friendly form (with Flashprint!!, Qwikkey and Write Hand Man running simultaneously).

I use the clone to test out 16-bit software. I currently have Windows up on it so it can serve as my clock and daily scheduler, but it's a very expensive alarm clock. Still, I have just been working out how to put Multiplan up in it inside a window so I can keep accounts in it at the same time. It wasn't too difficult — but you have to edit the supplied PIF (Program Information File) to tell it that Multiplan will not be speaking directly to the screen. Windows comes with a PIFEDIT program that helps with this. However, this seems to disable the really nice way Multiplan uses a mouse to help write up formulas. I'll keep working on it. Windows might be a friendly system — but it takes time getting everything up as one wants it.

There are some lovely programs like Notepad 2 and Word that only run on 16-bits. So — if you need them, you have to go 16-bit. Now, if I had an AT clone with a megabyte of memory and a hard disk — that could convert me from the 8-bit machine. So could desktop publishing gear (once it becomes affordable for the average user, that is).

I think people who find their needs satisfied with the 8-bit Microbees should stick to them — at least until the new generation of cheap AT clones (at current PC prices) and hard disks is here. I see that hard disk prices are already dropping fast — not that this is reflected in Microbee Systems prices right now.

IBM software looks wonderful — but it can be exasperatingly slow on a standard machine. Be warned!

Having said all that — a member of the South Australian User Group, Richard Jackson, has developed an add-on 22 Meg NEC hard disk for the Mitac, complete with power-supply and controller. The cost is around $1,400 including sales tax and he can be contacted on (08) 294 8591. He also sells for $28 an adapter to allow the standard Atari joystick to run on a Microbee.

Auto Backup From Memory Drive

If you are working in WordStar it is faster to have the document you are editing on the M:drive. But this is slightly risky: If there's a power cut — or your child decides to pull out a plug — you lose everything on the M:drive. Here's an easy way to be safe using Qwikkey —

First, install the command ^KS^QP on a key you rarely use — like the backslash. Then install on another key, say &, the following command ^K^O^R^M^R^MY^M

Now you use the first key to save your file and to return to the same position in the file. This places an up-to-date copy on the M:drive. Now, save the copy on M:drive to B:drive. The first time you have to do it the long way using ^KO and typing in the name. But every subsequent time you can save the file you are editing to the B:drive by typing the backslash and then &. Of course, you could combine both of the above command lines on one key — but I have found this doesn't work as well. It sometimes saves the file as M:Y for some reason.

There is an alternative way of doing this. When you are asked for the name of the file you want to edit on the initial menu, type filename b:. Then all you would have to use would be the backslash Qwikkey command; WordStar would automatically put a back-up file on B:drive.

However this is definitely *not* as easy as it sounds. WordStar will toggle the back-up file, that is, the first time it goes on B:drive, the next on M:drive and so on. If you exit from the file at the wrong point you will find only a back-up file on M:drive and you will have to retrieve your latest copy from B:drive.

Also, you will have to delete the back up file from B:drive before you can use the command again!

Swapping Disks in WordStar

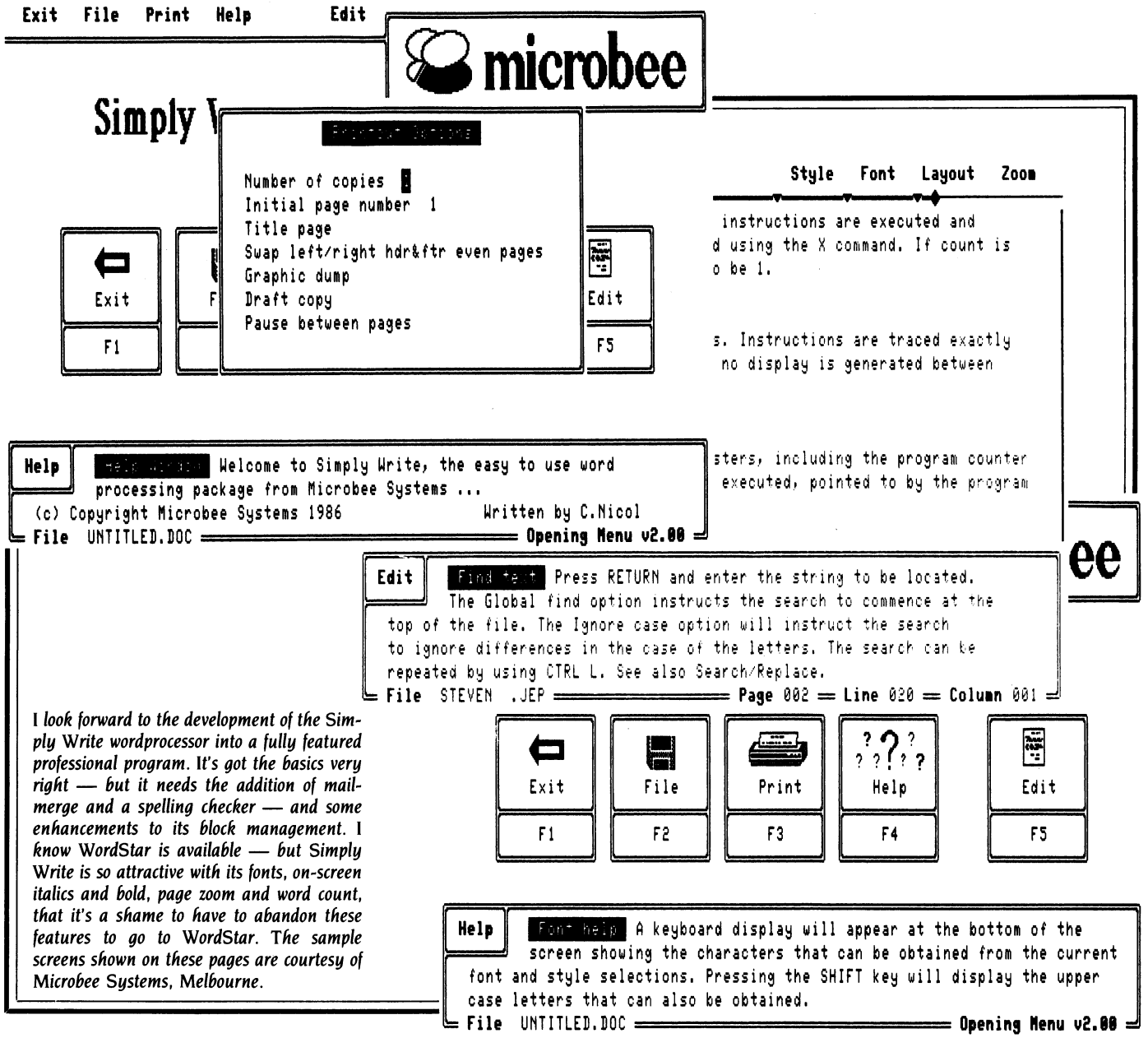
If you are busy writing a letter and you want to look for a copy of a previous letter kept on another disk, the easiest way to do this is to use the command ^KF.

This toggles on and off a disk directory and at the same time tells your machine that you have changed disks. I actually have set it up using Flashprint!! on my F key. All I have to do is to press ESC and then F for files.

If you want to read the old letter and then delete it afterwards, mark out an empty highlight block with ^KB and then ^KK and put the cursor within it. Then ^KR the old letter into the block. After you have read it you can delete it with ^KY.

I actually have made all this much simpler by using Qwikkey to assign most of these command to a single keys. I use the

BY JAN ROBERTS



I look forward to the development of the Simply Write wordprocessor into a fully featured professional program. It's got the basics very right — but it needs the addition of mail-merge and a spelling checker — and some enhancements to its block management. I know WordStar is available — but Simply Write is so attractive with its fonts, on-screen italics and bold, page zoom and word count, that it's a shame to have to abandon these features to go to WordStar. The sample screens shown on these pages are courtesy of Microbee Systems, Melbourne.

square brackets to start and end a block. I use the curly brackets to read in a document or read out a block to disk.

Fine Points of TRANSFER.COM

This is now a very finely worked out program. If you want a second copy of a file on the same disk, use COPY and type just a new name when you are asked for the destination. However, if you select two or more files for Copying, it will not allow you to enter a new name and will demand a drive name.

If you need to survey the directories of a lot of disks, use this program. Keep swapping disks in and out of both drives typing alternately L and B. Do not use A: — it retains in memory the first A:drive directory you call up and subsequently it does not change this directory no matter how many times you put in a different disk.

Colossal Hints on Colossal Caves

I haven't had much time to play this wonderful public domain giant game recently. But, other Caves' fans have sent me a stack of hints. It's always hard to write about games without giving away too much to all those out there who may not want hints. But — here are a few more in answer to people's letters —

□ Dragons — think of the craziest way to try to kill one — and you don't have to wear gloves.

□ Beware when you use certain magic words in the safe room — the blob will get you!

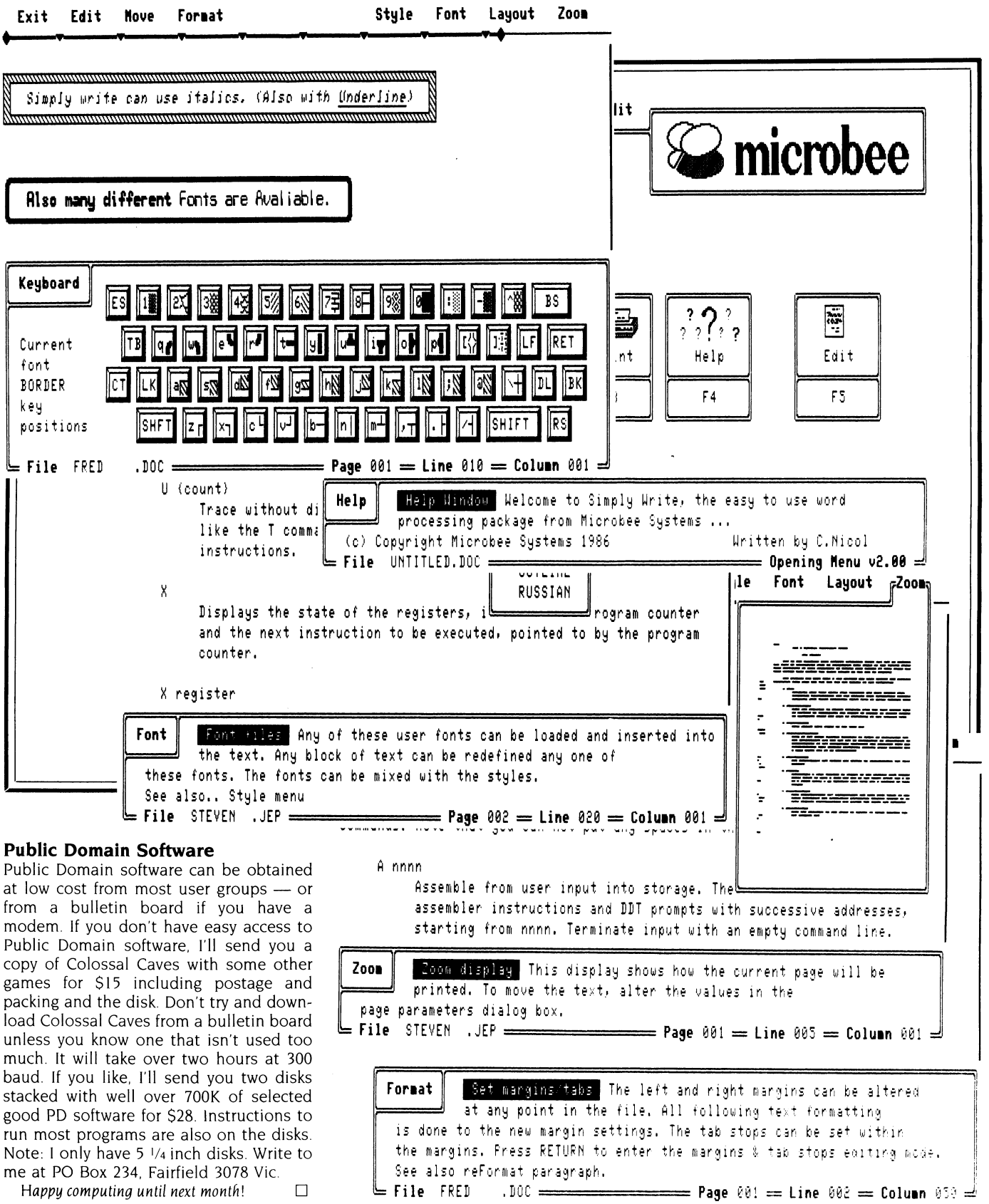
□ A certain fork-like instrument is good for eating clams.

□ The magic rod enables you to cross more than one perilous obstacle.

□ The giant's door *can* be opened — use something found under the Bass Strait.

□ Use a bird to help get the emerald.

For the above, thank Shane Crozier of Safety Bay, WA. (He wasn't so cryptic!) I've a number of other hints from reader's that I'll pass along in later columns.



U (count)
Trace without di
like the T comma
instructions.

X
Displays the state of the registers, i rogram counter and the next instruction to be executed, pointed to by the program counter.

X register

A nnnn
Assemble from user input into storage. The assembler instructions and DDT prompts with successive addresses, starting from nnnn. Terminate input with an empty command line.

Public Domain Software

Public Domain software can be obtained at low cost from most user groups — or from a bulletin board if you have a modem. If you don't have easy access to Public Domain software, I'll send you a copy of Colossal Caves with some other games for $15 including postage and packing and the disk. Don't try and download Colossal Caves from a bulletin board unless you know one that isn't used too much. It will take over two hours at 300 baud. If you like, I'll send you two disks stacked with well over 700K of selected good PD software for $28. Instructions to run most programs are also on the disks. Note: I only have 5 1/4 inch disks. Write to me at PO Box 234, Fairfield 3078 Vic.

Happy computing until next month! □

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All Contributions: should include your name, address, and home and office phone numbers (in case we need to check details). Each page of your submission, and any material sent with it, should also carry your name.

Contributions by Telephone: Contributors who have modems and suitable software (in the MODEM7/YAM mould — see our stories on Christensen Protocols in the May and June 1983 issues) can arrange direct transfer to our computers through our Bulletin Board system, which is on-line 24 hours a day, seven days a week. Contact our office by phone for details on transferring material in this way.

Contributions on Disk: Contributions can be accepted in most disk formats, although some have to be converted outside our offices, which will add to the (often lengthy) delay between receipt and acknowledgement. The preferred medium is IBM standard format single-sided, single-density, 20 cm (8 inch) CP/M disks or IBM PC-DOS minifloppies. We can also handle, in-office, most soft-sectored 13 cm (5.25 inch) disks, thanks to PC-Alien — so unless you have a particularly strange format, send it on disk straight from your machine. Please pack them extremely carefully if posting and label all disks with your name, address and phone number.

Listings: Unless it is absolutely impossible, we want listings produced on the computer. This reduces the risk of error — if the computer typed it, the computer probably accepted it. Print listings with a dark — preferably new — ribbon on white paper, and try to format the output to a narrow (40 characters) width. If they can't be produced on a printer, borrow a good typewriter — hand-written material is likely to sit around the office for a year before someone can find time to type it all out for you! Please provide an account of what the program does, how it works and so on. Any comments on the program should refer to the address, line number or label rather than to a page number. Any comments on modifying the program to work on other machines will be appreciated. Try to include a printout of at least part of a sample run if possible.

Style: All items should be typed (or printed) and double-spaced on plain white paper. We will only accept original copies — no photostats. Include your name, address, telephone number and the date on the first page of your manuscript (all manuscript pages should have your surname and page number in the top right-hand corner). Be clear and concise, and keep jargon and adjectives to a minimum. □

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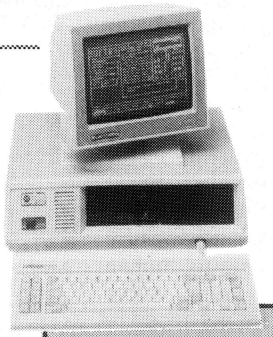

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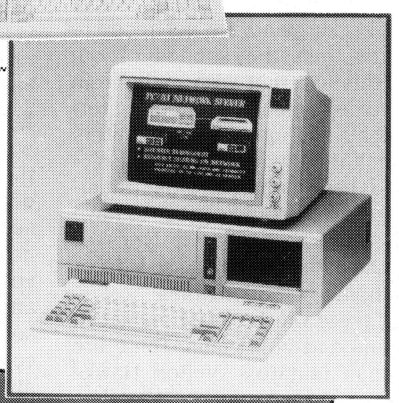

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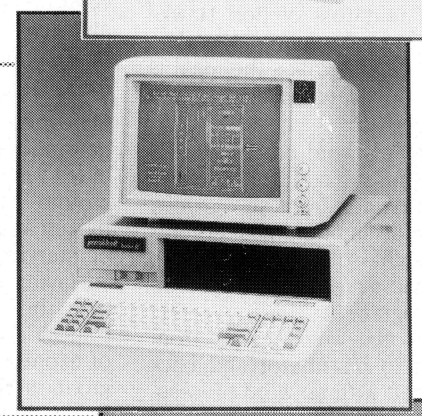

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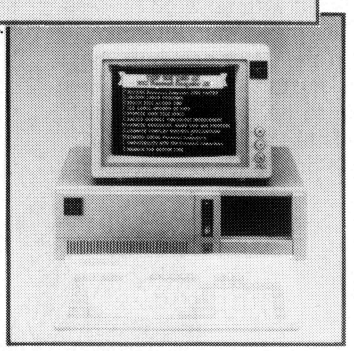

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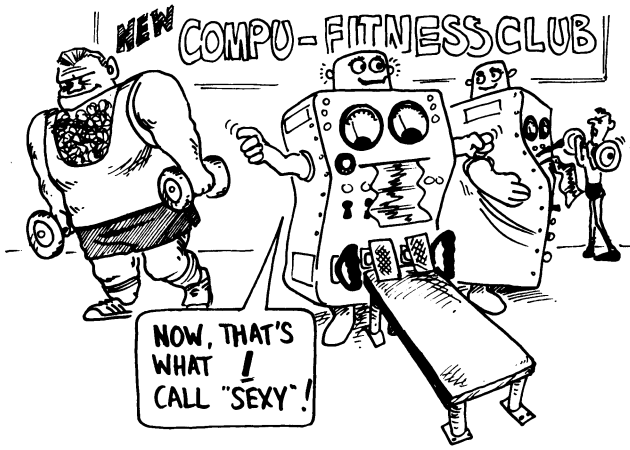
Cursory Glance

By Michael Burlace



■ Try telling a farmer who has had a mouse plague that a mouse makes a computer user-friendly and you'll probably find yourself looking down the barrels of a shotgun with no wedding in sight. You might also try suggesting it to one of those old-time cliche ladies who supposedly went 'EEK, a mouse!' You'd probably be flat out finding one these days, but it might make for an interesting situation.

■ A few companies are making musical synthesisers which can imitate human voices. Usually these are group voices suitable for backing and are not ready to handle words, just the sounds of our voices. Put this together with the current interest in voice simulation for computers and we might end up with computers which can imitate any human you wish.

You could have songs without musicians or singers. You could choose to have a spiritual singer doing bawdy lyrics or promoting the latest war toy for kids or Madonna singing nursery rhymes.

No doubt there will be a big market in imitating stars and politicians. There are enough human imitators of Bob Hawke around to keep the Labor party in leaders for decades to come. Perhaps the ideal is a Max Gillies synthesiser which can do a whole range of voices.

■ One of Australia's word processor distributors now requires a statutory declaration with each upgrade from an old to a new version. The declaration must accompany all the original disks and manuals and state that the user has destroyed all copies of the program.

It takes about two weeks to get from client to dealer to distributor and back and the user is left with no word processing program in this time. Alternatively they can lie on their stat dec, but what's the point of asking for a stat dec and then forcing people to lie or to be unable to work? It sounds like a dumb situation.

People won't bother and so go looking for a different program with less restraint and the distributor loses out. The dealer gains by selling a whole new program instead of an upgrade. The client may gain or lose depending on what program they choose next.

■ How long before we see designer computers in designer colours. These days there are designer fruits, designer kids, no doubt designer designers. Plus we haven't seen the novelty computers to match the novelty phones and calculators. You can get phones disguised as frogs, cars, fruits and nudes of various genders and so on, so why not computers in similar styles? A computer designed as a sports car could give a whole new look to Lotus.

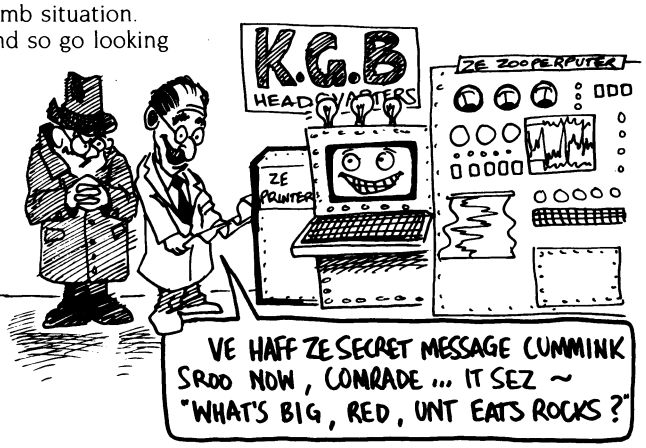
■ Are you a man or a mouse? I must be a mouse, I can use a computer.

■ Despite great advances in user-friendliness and artificial intelligence, there isn't much (any?) computer-generated humour around. One researcher in Britain has looked at the possibility of computers understanding or at least recognising jokes.

Having recognised that something is a joke, the computer then needs some way to decide whether it is funny and a means of expressing its appreciation or giving a groan. It could also comment that it had heard that one before or even give away the punchline if the teller was slow.

It could be linked to a voice synthesiser or one of those bags which were around 15 years ago which cackled and laughed when squeezed. Before the computer starts doing more than repeating the jokes it has heard it needs to learn a little about humour. Double meanings could easily be handled by something like a dictionary program, but fuzzy meanings, paradoxes, puns, analogies and various emotional links might be a little harder to handle.

Timing is crucial and doesn't easily equate to a digital process. And just in case you were wondering, this column is written *on* but not *by* a computer.



Bootstrap

Because of the present economic situation, many executives have no secretaries. Instead there is a telephonist, a receptionist and a word processing pool to cater for the whole company.

A recent development by an Adelaide company gives the poor exec a relief from all the extra calls coming down the line unfiltered by a secretary. The package is called Fobber and takes the technology of the auto-answer modem and combines it with a fairly sophisticated piece of software.

The software has a list of possible callers with a ranking for each. Its inbuilt voice-synthesiser handles all calls, screening out the nuisances and putting them onto a secretary-like fobbing-off voice.

The nuisance is none the wiser, the exec can look through a transcription of the call or listen to a recording of it and much time is saved. People can be downgraded in the middle of a call. In this case, the the call is interrupted and a fake Telecom technician comes on the line and says it will be out of order for a while.

The right customers get through satisfied and the company saves money. The nuisances are the only ones to suffer. Should go well, despite not having the other attributes of a secretary.

Michael Burlace is an independent computer consultant (and commentator). If you have any comments on the industry, or items to contribute to his column, please forward them care of YC, *or, he can be contacted on* (02) 281 2111. □

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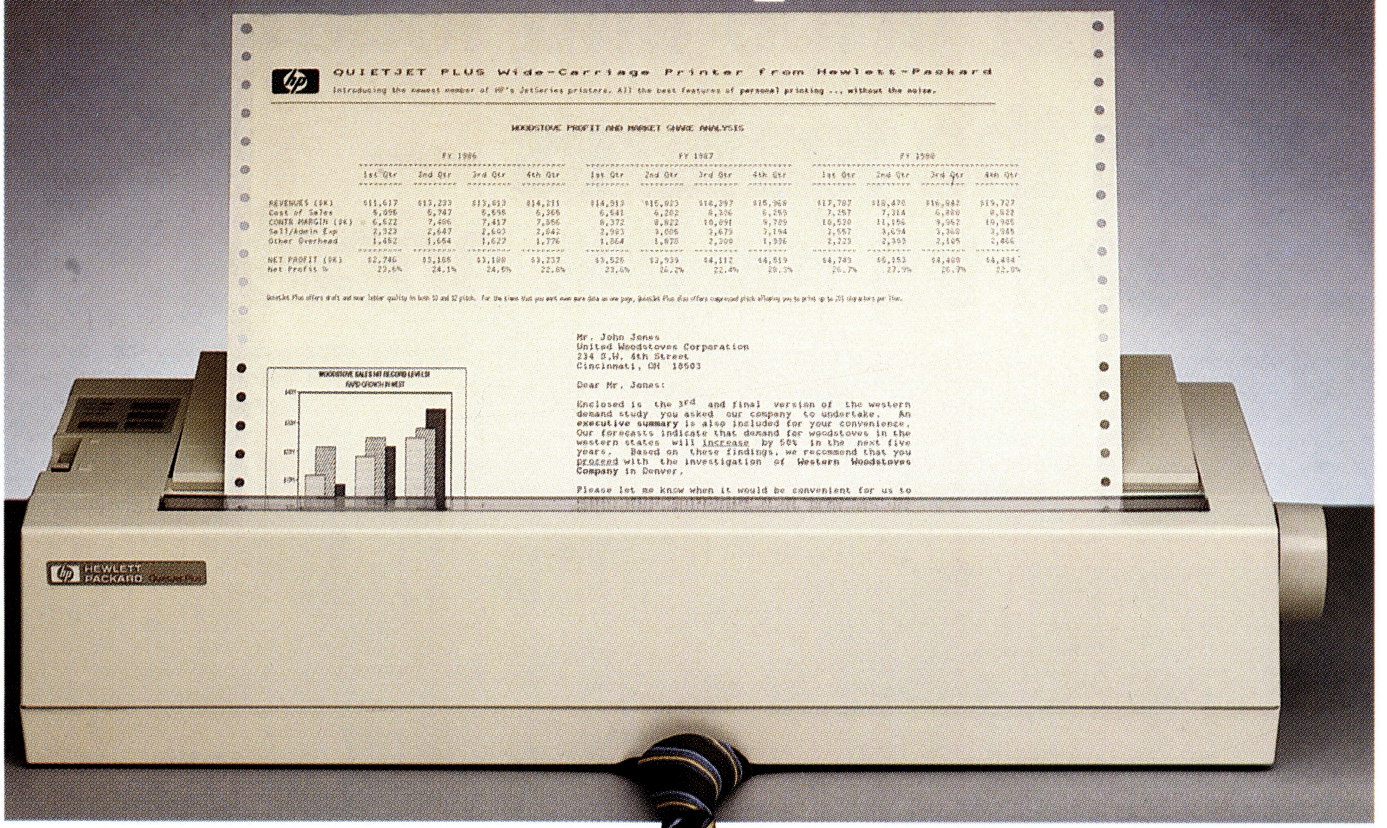

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Ricoh's front panel is especially user friendly — all functions of the printer are easily and comfortably available.

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