A Database Publication

AppleUser

Vol. 8 No. 4 April 1987 £1.25

Debugging with DDT

Enhancing Print Shop's graphics

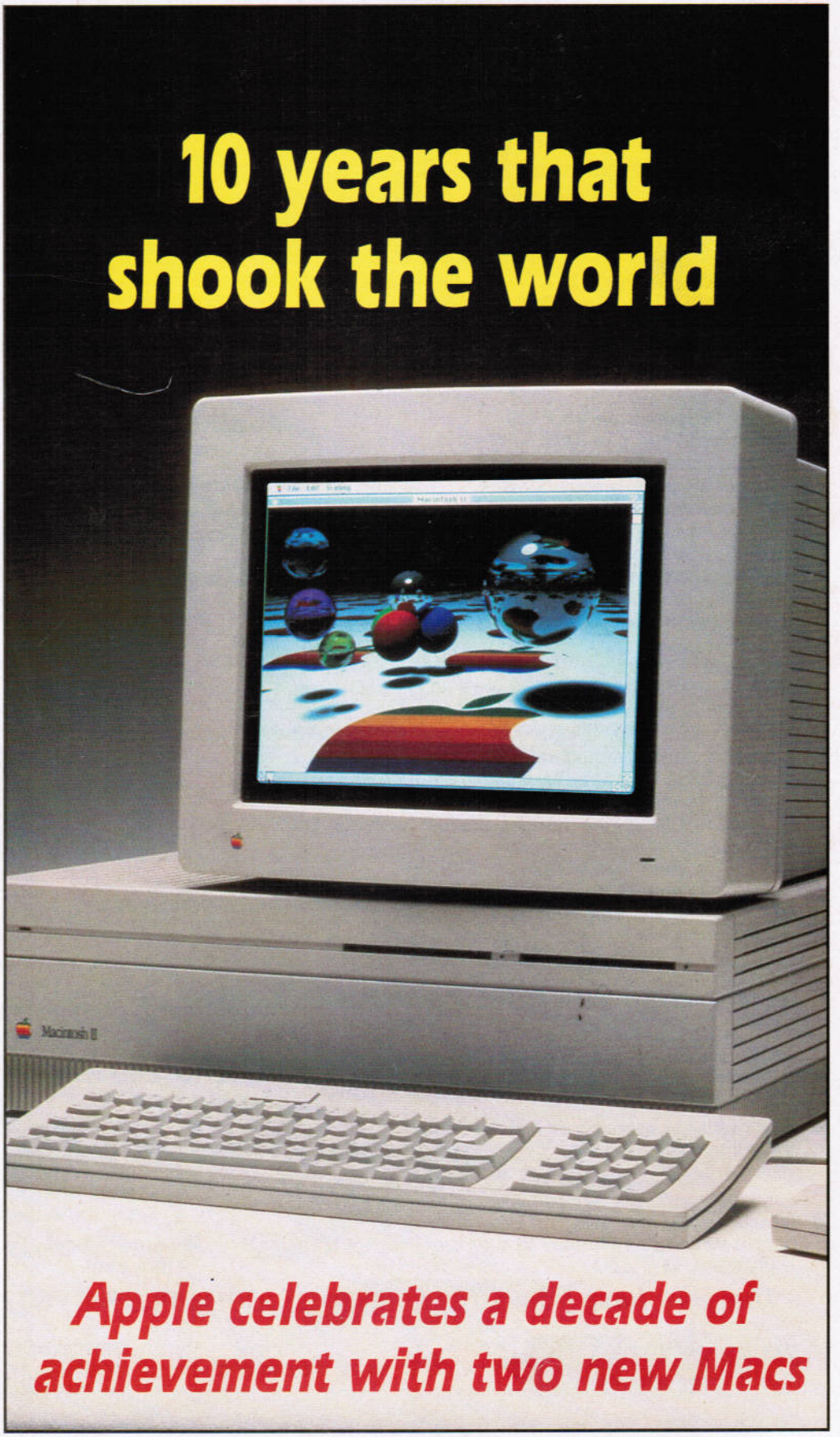
New techniques in Desktop Publishing

Automating Applesoft subroutines

Searching for the ideal word processor

REVIEWS

Pinpoint Accessory Program, Spelling Checker, Crusade in Europe, Alternate Reality, Hacker II, F-15 Strike Eagle



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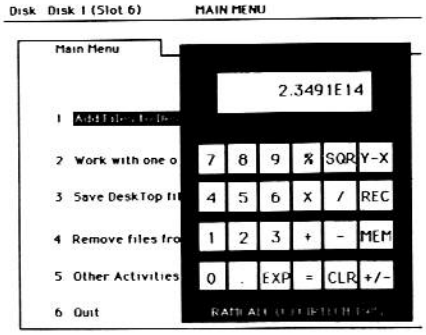

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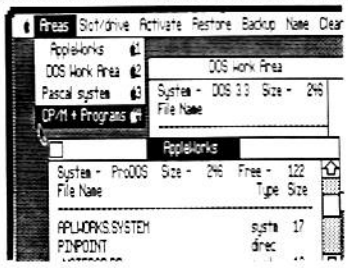

(Illustration shows graphics RamDesk Manager on an enhanced Apple IIe. A text version of RamDesk Manager is also included for use on other models).

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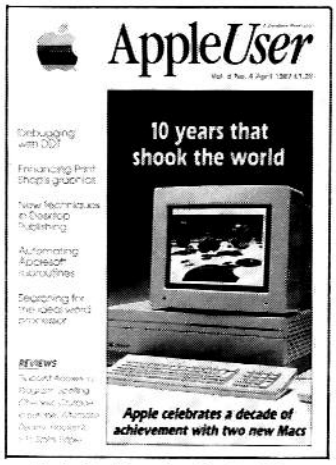

Vol. 7 No. 4 April 1987

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Technical Editor
Max Parrott
Production Editor
Peter Glover
Advertising Sales
John Snowden
Gail Blincow
Art Editor
Heather Sheldrick
Reviews Editor
Christopher Payne
News Editor
Mike Cowley

Tel: 061-456 8383 (Editorial)
061-456 8500 (Advertising)
061-480 0171 (Subscriptions)
Telex: 265871 MONREF G
Quoting Ref. 72:MAG001
Telecom Gold: 72:MAG001
Prestel Mailbox: 614568383

Published by:
Database Publications Ltd,
Europa House, 68 Chester Road,
Hazel Grove, Stockport SK7 5NY.

Subscription rates for
12 issues, post free:
£15 UK & Eire (sterling)
£23 Europe
£38 Overseas (airmail)

ABC 11,780
January-June 1986

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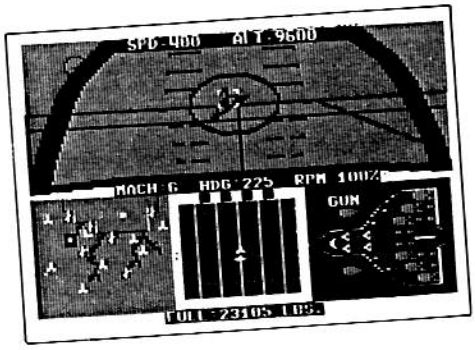
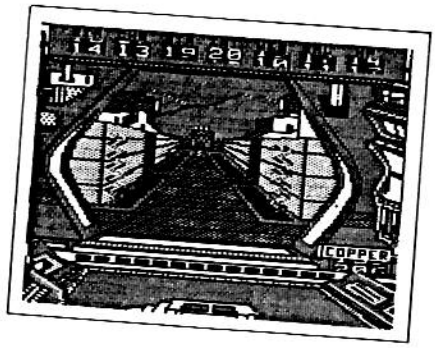
News trade distribution: Europress Sales and Distribution Limited, Unit 1, Burgess Road, Ivyhouse Lane, Hastings, East Sussex TN35 4NR. Tel: 0424 430422.

Features

5 News
Apple launches two new Macintosh's to celebrate its tenth birthday.

16 Fun & Games
Our reviewers look at F-15 Strike Eagle, Crusader in Europe, Alternate Reality: The City, Hacker II.





27 Desk Top Publishing
Roger Jones writes an idiot's guide to DTP; a book on Pagemaker techniques reviewed; Macs in the newspaper industry.

53 Encoding
Continuing the listing of Colin Davies' Ultra cypher system program.

57 Feedback
You write on assembly language, updating old systems, drive controllers, computer clubs . . .

Reviews

21 Geoff Wood looks at a spelling aid for AppleWorks users.

9 Jaromir Smejic, seeking the ideal word processor, looks at Gutenberg.

Programming

35 Stuart Bell's tutorial series: The Printer Control Unit in action.

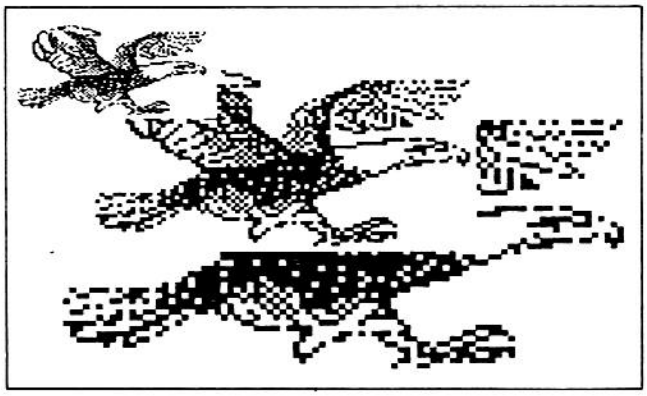
46 Dynamic debugging using DDT. Colin Foster and Robert Neale consider the technique.

Utilities

25 Geoff Wood tests a Pinpoint's Ram Enhancement Kit.

38 Image analysis techniques examined by P.A. Marshall.

40 Making more of Print Shop's graphics. Den James makes a few revisions.



48 Making Macroworks more friendly.

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Long live the revolution!

Wozniak

Jobs

HAPPY Birthday Apple Inc! The company which created the worldwide micro revolution is 10 years old.

To record the milestone, the corporation held simultaneous celebrations in London and at the Universal Studios in Los Angeles.

At these, it was revealed that four million Apple IIs and one million Macintosh computers have been sold to date.

And to ensure that its second decade will be at least as remarkable as its first, Apple announced it is to unveil more new products this year than during all of its previous 10 years.

In fact it chose its transatlantic birthday parties for the mass launch of 24 products, including two new machines.

All in all, a far cry from the humble business which was born in a garage in California.

There a genius by the name of Steve Wozniak perfected the Apple I and a hustler by the name of Steve Jobs persuaded him to sell it.

Even though events were soon to overtake them, the original intention of the two college dropouts was simply to build PC boards for $20 and sell them for $40.

But The Woz was a little nervous. "I worked it out that we would have had to sell about 50 of these to break even", he says, "and I didn't think that many people would buy them".

The rest is history:

1977: Sold in kit form at first, the Apple 1 is so successful that millionaire entrepeneur Mike Markkula comes on board and devises the business plan to incorporate Apple. The same year sees the launch of the Apple II in the US.

1978: The first Apple personal computer is sold in Europe.

1980: Volume manufacturing begins in Dallas, Texas, and Cork, Ireland. The Apple III is introduced, and in December, Apple goes public.

1983: An enhanced Apple II, the IIe, is unveiled and the Dallas plant manufactures its one millionth machine. The Lisa, the personal computer which evolved into the Macintosh, takes its bow. Apple enters the Fortune 500 list of leading American blue chip corporations.

1984: The Macintosh arrives, and with its use of windows, pull-down menus, bit mapped graphics and mouse input device, is heralded as the next industry standard. Enter the IIc. The two millionth Apple II is produced in Dallas.

1985: Apple goes into a slump as a result of a bruising battle with IBM. The company turns in a loss of $10 million -- its first – and lays off 20 per cent of its workforce.

At the same time Apple introduces the LaserWriter printer, the machine that was soon to help restore the company's prosperity by virtually founding the booming international desktop publishing market.

1986: The launch of the Macintosh Plus is followed by the introduction of the Macintosh 512k/800. A newly-streamlined Apple operation starts to flourish once more on desktop publishing income and goes on to introduce the latest in the Apple 11 range, the 11GS.

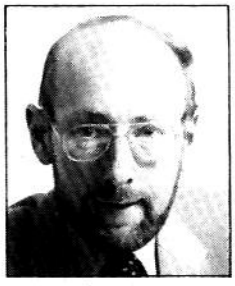
1987: Apple bounces back into financial health. It has gross profit margins over 50 per cent, $600 million in the bank, no debts and plans to spend $180 million on R & D this year.

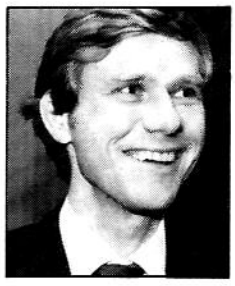
The company's value on Wall Street has soared from $900 million 20 months ago to $4.5 billion.

Happy Birthday Apple from the editor, staff, readers and advertisers of *Apple User*.

Where were they then?

Sugar


Sinclair


Hauser

Curry

IN the 10 years since Apple set in motion the personal computer industry, it has grown to be worth a staggering £32 billion worldwide.

Along the way it has spawned numerous companies some now giants in their own right, others that have simply slid back into obscurity.

It has also created a new breed of multi-millionaire from the enormous profits created by the spin-off from manufacturing other best-selling micros.

They are now household names. But what were they doing when Steve Wozniak and Steve Jobs were founding Apple back in 1977?

Alan Sugar, fresh from enjoying the financial rewards of successfully selling car aerials from his car boot, saw his future in home entertainment through A.M. Sugar Trading. Now known as Amstrad, it means that on paper, as of last month, he is reported to be worth £680 million.

Hermann Hauser and Chris Curry, who were to go on to found Acorn Computers, were both in Cambridge. Hauser was working on his PhD at King's College, while Curry was helping Clive Sinclair to develop the first pocket television.

With the help of the BBC licence, they were to take computing into British schools, but since have gone their separate ways.

Clive Sinclair meanwhile was fascinated by developments in California. Having already made a name as a pioneer in digital watches and calculators, he was quick to grasp the potential for the personal computer in the UK.

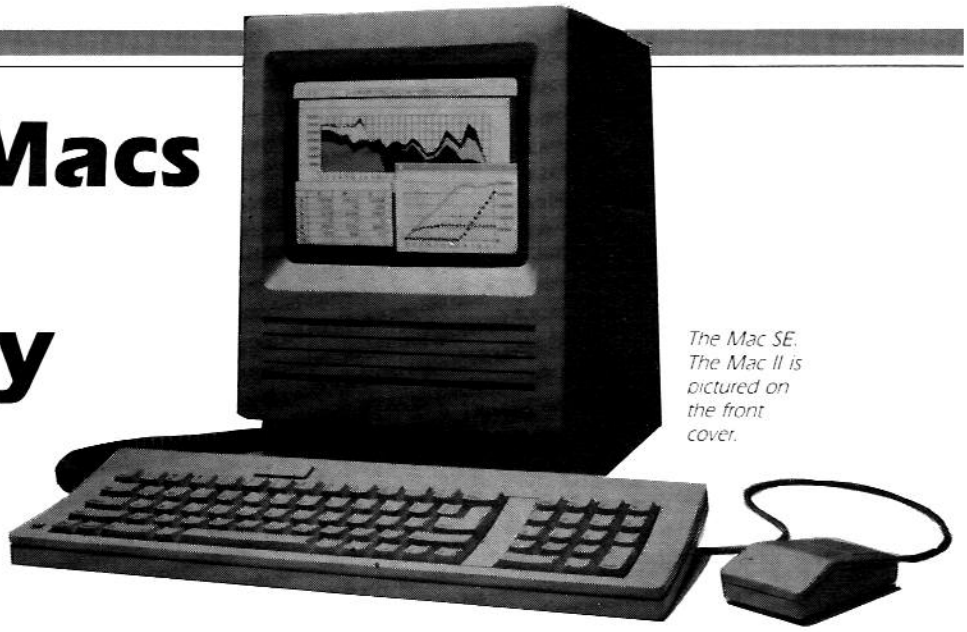
The result? The ZX80 and its successors, millions of pounds in revenue and a knighthood for Clive, then the ensuing slump and the enforced sell-out to Amstrad.

Yet another close observer of Apple 10 years ago was former concentration camp inmate Jack Tramiel. By 1977, the former typewriter salesman was installed as chief executive of Commodore International.

Established to market typewriters from Eastern Europe, Commodore was to go on to become a billion dollar computer company in its own right.

Ten years is not a long time in the general course of events. But it encompasses the total history of personal computing – thanks to Apple.

Two new Macs mark the anniversary



The Mac SE. The Mac II is pictured on the front cover.

APPLE selected its 10th birthday celebrations for the biggest mass launch of products in its history – and the promise of much more to come.

In all, it unveiled some 24 new lines, including two machines, the Macintosh 11 and the Macintosh SE.

Aimed to be the next flagship of the Macintosh range, the six slot open architecture 11 is based on the Motorola 68020 32 bit processor operating at 16MHz.

A floating point unit, the 68881 chip will enable the machine to perform mathematical operations up to 200 times faster than the 68020.

This will make it the most powerful member of the family to date, allowing it to run Macintosh software up to four times faster than the Mac Plus.

It also offers stunning graphics, with a look-up table offering a choice of 16.8 million colours.

Targeted at the high end business and educational markets, the Macintosh 11 offers one megabyte of ram as standard, expandable to eight megabytes on board, and a theoretical 1.5 gigabytes using add-on boards.

Up to two 800k floppy disc drives and one 20, 40 or 80 megabyte hard disc can be accommodated simultaneously by the machine.

Purchasers will have a choice of mono or colour displays, with both units featuring 640x480 pixel resolution and providing up to 256 colours or grey scales.

The user can also select from a choice of two keyboards, the Apple Keyboard or the Apple Extended Keyboard with 105 keys.

Available in July, the price of a single floppy monochrome system will be in the region of £4,500, while the top of the range internal 40 megabyte SCSI drive system will cost around £5,500.

Meanwhile the new Macintosh SE, an enhanced version of the Macintosh Plus is available now at £2,495. It has a standard IMb of memory expandable to 4Mb without the need for additional desk space for disc drives and associated cabling.

"Everyday business needs will continue to be served by the Plus", says Chris Calvert of Apple UK. "but the SE will serve the needs of those requiring the flexibility of a built-in expansion path".

Third parties are already developing add-in cards for the expansion slot to provide additional facilities such as video, datacomms, networking, storage and co-processors.

Every component in the SE has been redesigned with the exception of the tube.

Overall performance is claimed to be 15 to 20 per cent faster than the Plus. And while there is no route for upgrading Plus hardware to the SE, there is full software and peripheral compatibility between the two systems.

"Both the Macintosh SE and Macintosh 11 are important additions to the Macintosh line", says David Hancock, Apple UK's managing director. "However this is just the start. We'll be offering more new products during 1987 than the total for the previous 10 years".

SPECIFICATIONS

MACINTOSH SE:

Processor: MC68000, 32 bit, 7.8 MHz.
Memory: 1Mb ram, expandable to 4Mb, 256k rom, 256 bytes of user-settable parameter memory.
Capacity: 800k per formatted d/s discs, 3.5in hard shell media, 20Mb on optional hard disc.
Screen: 9in hi-res, 512 x 342 pixels, bit-mapped display.
Interface: Apple desktop bus connectors (x2) for communication with keyboard, mouse etc over low-speed bus, RS-232/RS-422 serial ports (x2), 230.4k baud max; external disc interface; system expansion connector: SCSI interface; sound port for external audio amplifier.
Sound: Four-voice sound with 8 bit digital-analog conversion using 22 KHz sample rate
Input: Line voltage 120/240 volts AC,RMS; frequency 47 to 63 Hz single phase; maximum power 100 watts.
Mouse: Mechanical tracking, optical shaft encoding; 3.54 pulse per mm (90 per in) of travel.
Keyboard: Options include Eastwood 81 keyswitch, ADB detachable with 10 key number pad, Saratoga 105 keyswitch, ADB detachable including 15 function keys, T cursor pad and 10 key number pad.
Clock: CMOS custom chip with seven year lithium battery.
Fan: 10 CFM cross flow.

MACINTOSH II

Processor: MC68020, 32 bit at 15.6 MHz.
Co-processor: 68881 floating-point device (IEEE standards).
Memory: 1Mb ram expandable to 8Mb on board; expandable to 2Gb in NuBus slots; 256k rom.
Management: Optional 68851 PMMU.
Disc storage: Options include 800k per formatted d/s disc, 3.5in hard-shell media; 20, 40, 80Mb CSI hard discs, internal and/or external.
Video card: Apple custom frame buffer chip; standard 1-4 bits per pixel up to 256 colours or shades of grey; look-up table with 16.8 million colours.
Monitors: Options include analog 12in mono, 640 x 480 pixels; analog 13-in RGB, 640 x 480 pixels.
Interfaces: Mini-8 serial (RS-232/RS-422) ports (x2); DB-25 SCSI port; Apple desktop bus ports (x2); NuBus internal slots supporting full 32 bit address and data lines (x6).
Sound: Apple custom digital sound chip including four voice wave table synthesis, stereo sampling generator capable of driving stereo headphones.
Input volts: 90-140 VAC; 170-270 VAC, automatically configured; frequency, 48 to 62 Hz; maximum power, 230 watts, not including monitor power.
Mouse: Mechanical tracking, optical shaft encoding 3.54 pulse per mm (90 per in) of travel.
Keyboard: Options include Eastwood 81 keyswitch ADB detachable with 10 key number pad; Saratoga 105 keyswitch ADB detachable including 15 function keys, T cursor pad and 10 key number pad.

IBM TALK

If you can't beat 'em, get 'em to join you, has become the Apple philosophy over data exchange.

The AppleTalk PC Card, one of the company's 10th anniversary batch of support products, is for IBM compatibles. It allows them to share information on an AppleTalk network.

Apple claims this represents a significant step towards smoother communications between Apple hardware and the MS Dos environment.

It is part of the company's policy to achieve greater communication between systems.

The card is a half-sized printed circuit board with a microprocessor and appropriate protocols on its rom. Software is included which converts MS Dos-generated text into PostSript.

A product manager at Apple UK, Richard Bradley explained: "The card will open up for users of MS Dos machines the opportunity to link into a PostScript-based desktop publishing system and with it the advantages of Macintosh-based networks".

Backup

TWO software enhancements for the MacBottom Hard Disc have been released by PCPC; and existing users can get them free.

All MacBottom owners can get these improvements free by sending a C5 sae and a floppy disc to A&M Systems in Bicester.

John Smith with his alarm

Mac alarm is a real winner

ELECTRONICS expert John Smith became so attached to his Apple Macintosh that he invented an alarm to protect it.

And from there has has begun a business which could soon be selling around the world.

The MacSentry runs off two batteries and is activated by a printed circuit board. It is housed in a flat steel box finished and shaped to match the computer, which stands on it.

If anyone tries to lift the machine, the alarm lets out an ear-piercing wail.

It is switched on only by using a key and cannot be turned off without it. The siren can apparently sound for seven hours.

"After I invented the alarm I began to wonder how other people would react to it.

"Then I went to a computer show and saw all sorts of exhibitors hopping around worried about the safety of their products. Some actually employed security people to look after the stuff", said 45-year-old John.

"I thought to myself that my device could have done the job for them. So I went home and got on with developing the idea".

Another feather in his cap is his success in the Business World Inventor of the Year Contest. He was one of the 12 finalists chosen from the 130 original entries.

With the help of a Manpower Services Commission Enterprise Allowance Scheme, he began to expand into other areas.

He has had inquiries from the US for the computer alarm and British interest in his other gadgets.

The first adaptation was to a small platform which fits inside a car boot. Once the alarm is switched on, any shopping or indeed any item placed on top of it is protected.

The alarm has also been reduced to camera-bag size for use by photographers who have to carry about expensive equipment.

Mr Smith's latest adaptation is to fit it to a strong steel chock which can be placed behind the wheel of a caravan or boat trailer.

When a thief tries to make off with the caravan, pulling it away from the chock triggers the alarm.

This design also features a flashing amber warning light for if the vehicle breaks down.

BB for Apple II

A FREE, unlimited-time bulletin board for Apple II users is operating out of Bracknell.

Hypabyte is on the usual bulletin board format, at 300 baud, on 0344-411698 from 10 am to 11.30 pm, seven days a week.

All the software for the board was written by Leon Seltsikas who is now able to modify the programs remotely through a modem.

John Bryhn is main sysop and his wife, Sandra is assistant sysop as well as writing her own section.

There is a dedicated mail section, Gametalk, Adventurers' Tavern, sales and wants, and the Hypabyte Dungeon.

New product deadlines

HERE is Apple's product availability schedule:

Macintosh SE dual floppy – *immediate*

Macintosh SE single floppy, internal hard disc – *immediate*

Macintosh II single floppy – *later in 1987*

Macintosh II single floppy, internal hard disc – *late 1987*

Monitors and video cards:

Apple HiRes 12in mono – *later in 1987*

Apple HiRes 13in RGB – *later in 1987*

1-4 bit video card – *later in 1987*

8 bit video card expansion kit – *later in 1987*

Storage:

Macintosh Internal 800k drive – *later in 1987*

Macintosh Internal 20SC hard disc – *later in 1987*

Macintosh Internal 40SC hard disc – *later in 1987*

Macintosh Internal 80SC hard disc – *later in 1987*

Apple hard disc 40SC – *soon*

Apple hard disc 80 SC – *later in 1987*

Apple tape streamer 40SC – *soon*

Miscellaneous:

1Mb ram expansion kit – *soon*

2Mb ram expansion kit – *soon*

Apple keyboard – *immediate*

Apple extended keyboard – *later in 1987*

Alternative operating environments:

A/UX – *later in 1987*

Apple EtherTalk Interface card – *later in 1987*

PMMU chip – *later in 1987*

Communications products:

Appleshare – *immediate*

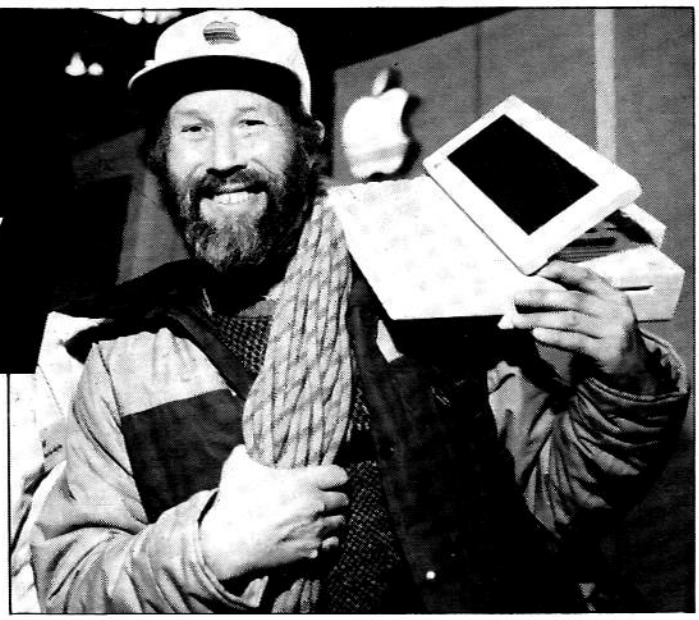
AppleTalk PC Card – *immediate*

5.25in Macintosh II controller card – *soon*

5.25in Macintosh SE controller card – *soon*

Apple 5.25in MFM drive (360k) –

Chris leaves his baby behind



APPLE enthusiast Chris Bonington left his favourite technology behind when he set off to conquer yet another Himalayan mountain.

His expedition to Menlungste, the remote Tibetan peak he intends to climb, doesn't require the solar-powered IIc which accompanied him to the top of Everest last year.

To make matters worse, Bonington has had to tear himself away from the latest love of his life, the new IIGS on which he planned this latest expedition.

"I'll miss my micros", he told Apple User *just before leaving for Tibet. "The IIGS is a marvellous machine and I was really enjoying working on it.*

"But even though Menlungste is unconquered so far, it's a small trip compared to the Everest expedition, and doesn't require the same degree of monitoring. So we won't need the IIc.

"Instead of sending back dozens of reports like I did from Everest I have to produce only one, so I'm taking my boring old typewriter with me this time.

"But I'm looking forward to getting back to my keyboard when I return to my base in the Lake District".

Where supplies ban hits the hardest

IF British firms stop supplying South Africa with Apple computer support products it could hurt the black population, claims an *Apple User* reader who lives there.

A voluntary ban on exports of Apple products to South Africa by UK suppliers was called for by DarkStar Systems director Robert Sather in a recent issue of *Apple User*.

But pharmacist Harold Durrant, who lives in Pretoria, says this would be like "throwing the baby out with the bath water".

He told *Apple User*: "I work at GaRankuwa Hospital, one of the biggest in Africa, which caters almost exclusively for black patients.

"By an amazing coincidence, the day after reading the *Apple User* article about banning computer supplies to South Africa, a lecturer here mentioned that the best program on his subject was for an Apple – but that an Apple was not available for his use.

"I would have normally offered to lend him my own, but if it was damaged it probably could not be mended and the freely available clones are not as good.

"So we shall probably have to accept a not-so-good program for our black patients. And this for our work in total parenteral nutrition – an expensive procedure where the only nourishment a cancer patient receives is by injection.

"When I learned to use a shotgun I was taught never to let the fringe of the shot cause injury. Boycotters could, with advantage, remember this.

"I had a cataract operation with a synthetic transplant done at GaRankuwa because there are few better eye departments anywhere in the world.

"I was, of course, admitted to one of the wards for black patients".

Fantasy for the Apple II

AMERICAN publisher Strategic Simulations has released fantasy game Realms of Darkness for the Apple II.

It combines elements of traditional adventure games, using keystrokes or joystick, with graphics/text action using an adventure mode parser where command phrases can be used to guide players in and out of tight spots.

The parser allows players to manipulate objects and talk directly to game characters via the keyboard.

Realms of Darkness is a big game with more than 150 hours of fantasy adventure and role-playing for intermediate-level players. Price $39.95.

IBM link

DATA communications specialist KMW Systems International has released 3XLink, a device which allows Macintosh users to interface directly into IBM System 34, 36 and 38 computers.

Comprising a KMW Matchbox and special software for the Macintosh, 3XLink allows users to emulate the functions of an IBM 5251/91 terminal with pull-down menus for special keys.

In addition, a printer attached to the Macintosh can appear to System 3X as an IBM5256 printer and can be addressed as a separate device if required.

Also available for use with 3XLink is a file transfer package program which enables bi-directional transfer of files between the Macintosh and System 3X.

Micro Live is facing the axe

TELEVISION'S only regular computer programme, Micro Live, faces the axe. And Database Publications, prompted by hosts of letters from readers, is determined to ensure the axe will not fall.

The last Micro Live in the present series was scheduled for the end of March. Head of Continuing Education (Television) at the BBC David Hargreaves said: "The present season of Micro Live is its third. We have decided not to plan a fourth for next winter.

"We want to pause, take stock and think about how we ought to be making the best contribution to our understanding of information technology in the future."

Derek Meakin, head of Database Publications, said: "Micro Live has played a leading role in introducing the delights of computing to an ever-growing audience.

"To kill the series now, when so many exciting developments are taking place in the whole world of microcomputing, is a retrograde step".

So, *Apple User* readers, it's time to play your part. If you want to help save Micro Live, write to: The Controller, BBC 2, TV Centre, Wood Lane, London W12.

In search of the most amazing word processor

Jaromir Smejic nears the end of a pilgrimage to find his ideal software

I AGREE, the headline above is some sort of plagiarism and most probably you know the title from somewhere else, but believe it or not, for me it really was some search!

For a better understanding, let me explain what problems can be solved with the Apple II family of computers with appropriate software. Also, I hope that this article will be of some help, not only to non-English speaking Apple users but also for all those wishing to create visually appealing and more attractive documents.

Let me introduce myself. I am a freelance and founder member of the audio visual (or multimedia, or mixed media) creative team SCARS working for clients the whole world over.

A long time ago, we started to program our presentations with an Apple II+ and superb software and hardware from Electrosonic Ltd of London.

Previously we prepared presentations with our own hardware and software, but found that it was much better for us to concentrate our efforts on the purely creative aspects of the presentations, interior and exhibition designs and so on and to choose the best hardware and software on the world market.

Lucky decision

We tested four systems, three from the USA and one from England (remember, this was more than eight years ago, now there are more than 30 main suppliers for such systems, but still Electrosonic is in the first line) and decided, that the English one was the best suited to us.

This was a lucky decision, because it was also our first contact with Apple II computers; other companies used their own specialised computers.

I immediately recognised the big advantage of choosing the Apple II+ for programming, that is the unlimited possibilities it offered not only for our purposes, but also for many other applications as well. Within a short time I was using the Apple II+ for database and spreadsheet applications (do you remember the first versions of VisiCalc and VisiDex?).

However, the choice of word processor was, I was convinced, only temporary. As a matter of fact the solution really was a temporary one, but with the catch that the temporary period took over seven years. However, the target is very near now and attainable.

The problem was that my own language, Czech, has in its alphabet many characters with accents – four different kinds – and for that reason we also have a different keyboard layout. Compared with the English keyboard, we have in place of some numbers, characters with accents and the numbers themselves are shifted (on the same keytops as on the English one, but accessible with the Shift key). There are other changes as well.

However, I was looking not only for a word processor usable for documents in my native language, but for one to write scripts, books, forms and other documents for our customers in their native language.

The problem was that we have customers of many different nationalities and we wanted to have, as part of the word processor's software, several different alphabet sets, if only for drafts.

In the first place there would be the English language, followed by French, Spanish and so on. Although we were working in India, Japan and the Middle East I didn't expect to find a word processor able to comply with all these alphabets. You see how modest my wants were!

I limited my search to word processors with a minimum of 94 characters with custom definable fonts and a suitable font editor with a minimum matrix size of 7 × 12. I was very well aware that it would be necessary to use a hi-res screen display as well as a slower, graphic printing mode.

There were other practicable uses of the Apple II+ with appropriate software within our line of work. Besides creating documents, keeping track of our data and helping us to prepare a budget, I started to use the hi-res graphic pictures for creating covers, title pages and so on for our documents.

The specialty of our creative team is to deliver, not only audio-visual presentations and complete interior solutions, but also all hardware and other material and work, including installation and operation.

Now and then our clients ask for the famous last minute changes, including changes in some slides with titles. This was OK when we were working in a big city where it was no problem to find a graphic or printer's workshop, to design a new title and make a new slide.

Then with overnight work, developing in a good laboratory (or later with our own small, travelling photo laboratory) everything was OK. But in some countries and cities and on some occasions, like holidays, such a solution was unfortunately out of the question.

And here the old, respected Apple II+ came again to our assistance. We created new titles with the help of some good graphics software, and took shots from the display or in some cases from the printout. We needed software with a wide base of good fonts in at least two sizes and with a font editor enabling us to design non-English characters and symbols.

Since that time I have had a vision that all work connected with preparing various documents with text (in several languages, font sizes, styles and so on) and pictures should be possible with one piece of software – a word processor using a hi-res screen capable of printing documents both in hi-res graphic and text mode.

Temporary solution

My search for such a paragon was long, but I think that now I am getting to the end of my pilgrimage.

However, in the early days when this was still only a vision, no such word processor was available and I naturally chose Apple's own word product, Apple-Writer, as a temporary solution.

It was remarkably easy to get started with, but its many limitations became apparent after some days of use. At that time I was (in)famous among my colleagues for my "telegram" style documents in Czech, because all were without accents, as is normal with telegrams.

In the end they got used to this style, but they were not happy – and frankly speaking, nor was I. Sometimes words without accents have a different meaning and besides it was a solution usable between friends only, I can't use such a document outside our "inner circle".

The next step was adding the Combined Graphic Writer (Computer Stations Inc. USA ▷

◁ 1981) software that allows flexibility in the printed output. It worked with AppleWriter 1.0 and 1.1 in much the same way as the FontWorks software works today with AppleWorks (naturally without the ability to print sideways), that is you had to embed into your AppleWriter text special Graphic Writer commands (you can freely choose any character for this command).

You could use 10 different character fonts from a total of 21 – all from the famous, in those days, Apple Dos Tool Kit in one document.

After choosing your font(s) and embedding all commands you were able to print your AppleWriter document file via the Combined Graphic Writer. You could also print short notices from an Applesoft program.

This software, though useful in a limited way was no solution to our problems. It was unsuitable for documents, because for non-English letters you had to use symbols only and then you have on the screen mixed letters and symbols in words – try proofreading such a document on the screen!

And there was a second reason: the Apple Dos Tool Kit's font editor matrix (7 × 8) is too small for creating nice looking fonts with special symbols and letters with accents. (Please note, that all notations in this article for matrix or picture sizes are quoted as width × height).

The search continued. For creating headings, title pages, titles for slides, overhead projectors transparencies and so on. I have successively used Higher Text II, the Complete Graphic System, Fontrix, Font and Shape Mechanic, Print Shop and other similar software.

Three Gutenbergs

In the meantime the Gutenberg word processor, named after the German inventor of printing with movable characters (1445) and printer of the famous Gutenberg Bible, was introduced on the market (1981) and advertised as a multi-purpose, multi-lingual word processing and text formatting program written for the Apple II family of micros and allowing up to 21 different printer fonts within a single line; proportionally spaced in 14 different print pitches and micro-justified lines.

What's more, the promise of mixing text and graphics, with hi-res pictures and removing nearly all the restrictions that a user might encounter was added.

Needless to say, I immediately bought this expensive piece of software, because the advertisement promised to fulfil my vision. Please, don't laugh at me, this was in 1981, and I was still a comparatively inexperienced Apple user.

I didn't know that advertisements for software are in one respect exactly the same as for all others – they practically never tell you of the limitations and deficiencies of the advertised programs, nor that some capabilities are strictly hardware dependent, not about the difficult learning curve, and so on. Now I am perhaps better aware of life in the software and hardware jungle I will never, I hope, make this mistake again.

Gutenberg was (and still is in today's reincarnation in two shapes – Gutenberg Sr. and Gutenberg Jr.) a fine piece of software. It has some really exotic features and can solve some very specific problems, but certainly it is neither a general purpose word processor, nor the word processor of my vision, nor a user-friendly and consumer-oriented product.

Editing with Gutenberg is done on a text screen in low resolution (22 lines per screen to display only the normal 94 Ascii characters) or on a hi-res screen in high resolution (11 lines per screen to display in addition up to 115 extra, user-defined characters). The latter is suitable for a custom font size (matrix 7 × 12) and within it you can define specially shaped characters, foreign language characters with accents, mathematical symbols and so on.

The Shift key modification and Gutenberg

AS the first version of Gutenberg worked with a hi-res screen, no lower case adapter for the Apple II+ was necessary, but you had to make the famous Shift key modification all the same.

For Gutenberg it doesn't matter whether you have an Apple II+ or IIe with lower case, it only checks whether this modification of the hardware is made and if not, refuses to cooperate with you.

By the way, do you know that if you get the original version of Gutenberg or another piece of software, which needs this modification it is possible to make it on Apple IIe, too?

The mod on the IIe is not mentioned in any Apple manual, but is very simple.

On the motherboard you will find a jumper X-6 (see also Apple IIe Reference Manual, page 180, Figure 7-14b, schematic diagram, part 2). For the Shift key modification it is necessary to solder together both divided halves of this jumper.

This modification will make no difference to other software, except for the loss of the game connector switch input PB2 (connected to the internal connector pin number 4 and back panel connector pin number 6), because normally only switches PB0 and PB1 are used.

Character sets

Because Gutenberg is able to work with two alternate sets of characters and also with many Control "characters", you have at your disposal up to 209 different characters and (with Gutenberg Sr. only) 10 foreign fonts besides English – they include French, Spanish, German, Italian, Portuguese, Serbian and Hebrew.

Gutenberg's Editing has some peculiarities. In the insert mode, text is parted by an unusual wide gap to make room for the next piece of text, and the overwrite mode always terminates at the end of the line.

The screen doesn't scroll; instead it is re-written and advanced by one line, a sentence or a paragraph at a time, and this is a little annoying. And from the ergonomic point of view it is not too good for your eyes.

On the other hand Gutenberg has a very powerful Search function which is maskable as defined by 10 types of masks. For example, the mask can be such that the character must be in the range 0 to 9.

Another spectacular feature of Gutenberg is the screen, which is divided into two windows. You can not only load a separate file into each window, but can also edit each file separately and move words, sentences or blocks from one file to another.

This feature can be found only in a very limited number of word processors, and is really powerful and a very useful one.

The ability to create macros and use them directly or execute a whole chain of macros all at once is another efficient feature of Gutenberg. The text buffer is linked to the disc and allows very large disc work files.

The font editor is primitive and clumsy. You can't, for example, transfer to the editing window one character, edit it and after finishing all changes send it to its new Ascii location. There is no way of drawing or altering a character and then deciding where to put it.

Fort example, if you need to add an accent on the top of e you can't simply add this accent to e and substitute this created character for { (Ascii 125).

No, you have to transfer { to the edit window, clear the edit window and start designing e with accent from scratch. I have not found such a peculiarity in any other font editors. This one also has very limited editing commands.

On the other hand, Gutenberg does have the special PAINT program which can be used to prepare pictures, graphs, diagrams, borders, oversized individual letters and so on.

The images can be cropped, if desired and saved to disc. They can then be printed out by themselves or embedded in text. ▷

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Pictures can be up to 558 × 190 dots or 278 by 332. That is, a picture may extend across an ordinary page and be about 6cm high, or occupy one column of a two columns format and be about 13cm high. Exact dimensions vary from printer to printer.

Gutenberg does not allow you to use fonts or pictures from any other software, and this makes the use of its rather primitive paint program questionable.

Printer support

Gutenberg supports only a very limited number of printers and only a few more interface cards. Fully supported are Apple's DMP, the Centronic 737 and 739, C.Itoh 8510 and NEC 8023, others, including Epson, are only partially supported. For example, for Epson printers proportional spacing is not supported. The contemporary version (Gutenberg Sr.) also supports the Imagewriter I, C. Itoh Prowriter, Epson MX-100/III compatibles and the Gemini 10-X.

Another version, a stripped-down Gutenberg with very limited features named Gutenberg Jr., is strictly printer-specific and you have to state when buying it which printer you will be using.

As for interface cards, the Apple Super Serial, Grappler, Pkaso and Prometheus are supported. Gutenberg supports only Apple's ImageWriter and DMP when printer font down-loading. Printing in two columns mixing hi-res pictures, created by Gutenberg's own Paint program with the text, is supported.

Gutenberg is neither menu-driven nor has it a Help screen, and in spite of this the number of Gutenberg and Gutenberg Sr. formatting commands is overwhelming – there are about 120 of them and most are not mnemonic.

Of course this does mean that it has the most complete and sophisticated set of format commands of any Apple word processor based on Dos 3.3, but it also means that it is for dedicated users only. The Gutenberg Jr. provides an assortment of ready-to-run but unchangeable formats including three letter formats and some of them can be modified, but only slightly.

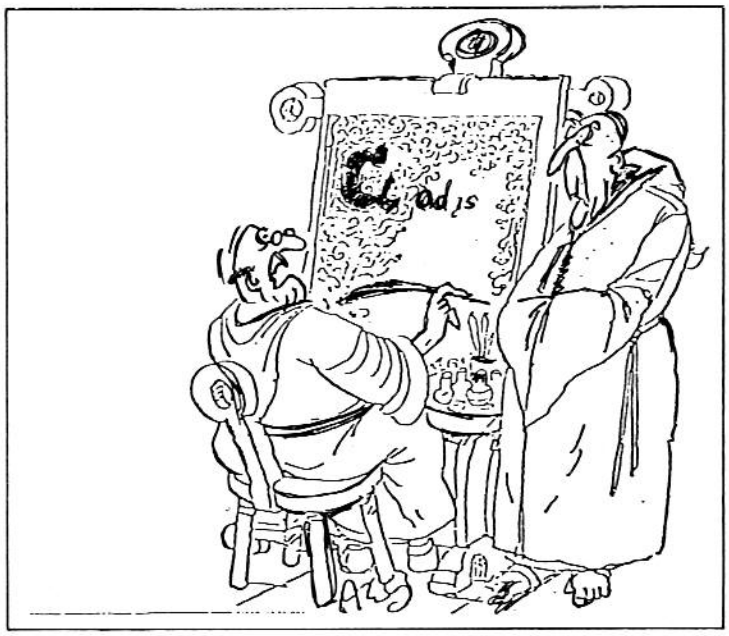
In addition Gutenberg has special conditional format commands which can be used to determine whether additional format commands are to be executed. For example, if the page number reaches a certain value, the program leaves a blank space for an additional paste-up of the picture.

You can't transfer this copy-protected program to hard or ram discs and you can move files in and out of Gutenberg only with a special GLOBAL program which can move data between Gutenberg, Dos 3.3 and CP/M (not Prodos) and which is exclusively in Gutenberg Sr only.

The original version of the Gutenberg documentation was unacceptable. It had no tutorial and was full of extremely detailed technical explanations, unnecessarily so for the average user.

The second version included a tutorial and was still very difficult to understand, but was at least usable. I only browse through the last version of the manual – it has 768 pages and it still is not professionally prepared.

Saving the worst news at the end, Gutenberg is certainly not a WYSIWYG (What You See Is What You Get) word processor. On the contrary, you have to create special files with formatting commands and always use one of them linked with your text file. You never know for sure exactly how your document will be printed before seeing the end product.



Deadline? Nobody told me anything about a deadline

Pros and cons

After working for some months with Gutenberg I finally reached the conclusion that it is certainly neither a word processor for most of us nor for normal professional users, regardless of some of its outstanding abilities and the availability of so many special characters.

The program is extremely complex and because of its command structure and quantity will require a great deal of time to master. If you are not working with it for hours each day, you will often have to refer to the manual – and to find out exactly what you need is not so easy.

The program was created by Johann Wagner, whose background was in traditional printing, together with two co-authors, both university professors, in Canada. The trio created Gutenberg to have a word processor suitable for typesetting and printing papers and other documents in different layouts.

Gutenberg is designed to do these things very well. If you are working with documents with complex and unusual formats which are never or seldom changed, if you need to use special characters or symbols and if you don't have a LaserWriter and Apple IIGS, or a Macintosh with PageMaker, and are willing to spend a great deal of time and considerable amount of money and effort, then, perhaps Gutenberg is for you. But it most certainly is not a general purpose package. And it is overpriced.

OK, that's all about Gutenberg. In due course I switched to the Apple IIe, mainly with AppleWriter IIe (later with AppleWorks, but this is another story), as I still sought a solution to my problem.

Of more than 50 word processing programs for the Apple II family about six work in the graphic mode, but not all have a font editor. Some of these word processors using the graphic mode are very old now and not supported any more – Super-Text, SuperScribe, ScreenWriter, Zardax. Finally I came across MultiScribe . . . more of which next month.

A free 16 page brochure, describing in detail many features of both versions of this product can be obtained from Gutenberg Software, 47 Lewiston Road, Scarborough, Ontario, Canada, M1P 1X8. Tel: 416 757 3320. Price: Gutenberg Sr. CDN $460, Gutenberg Jr. CDN $118.

□

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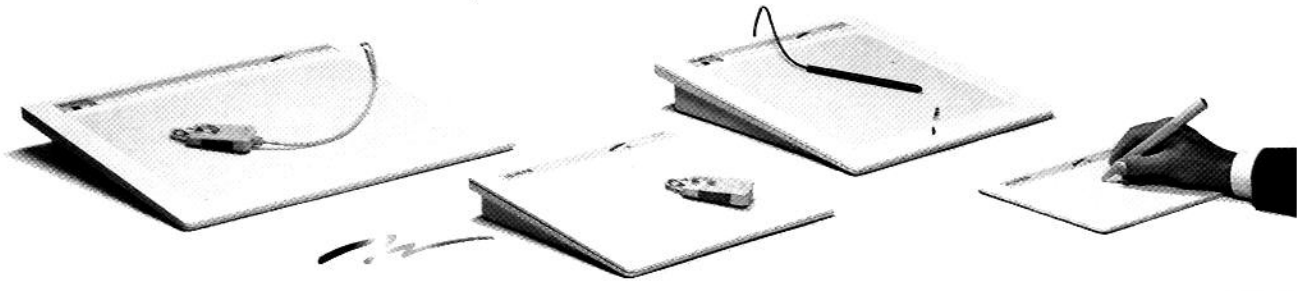

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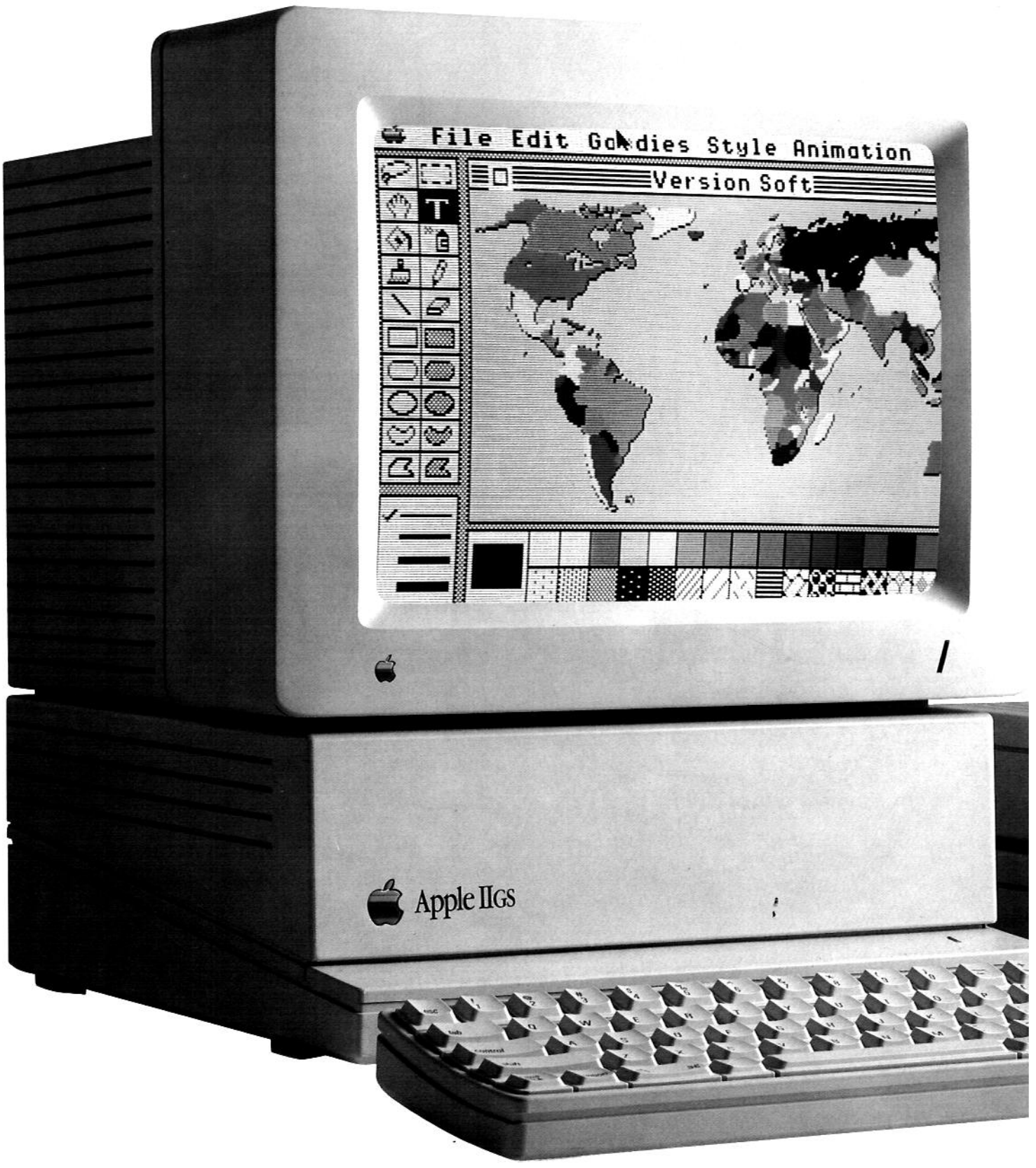

Apple Computer UK Limited, Eastman Way, H
Apple, The Apple Logo, Macintosh an

t, the power of the future.

There are three million Apple II users around the world.

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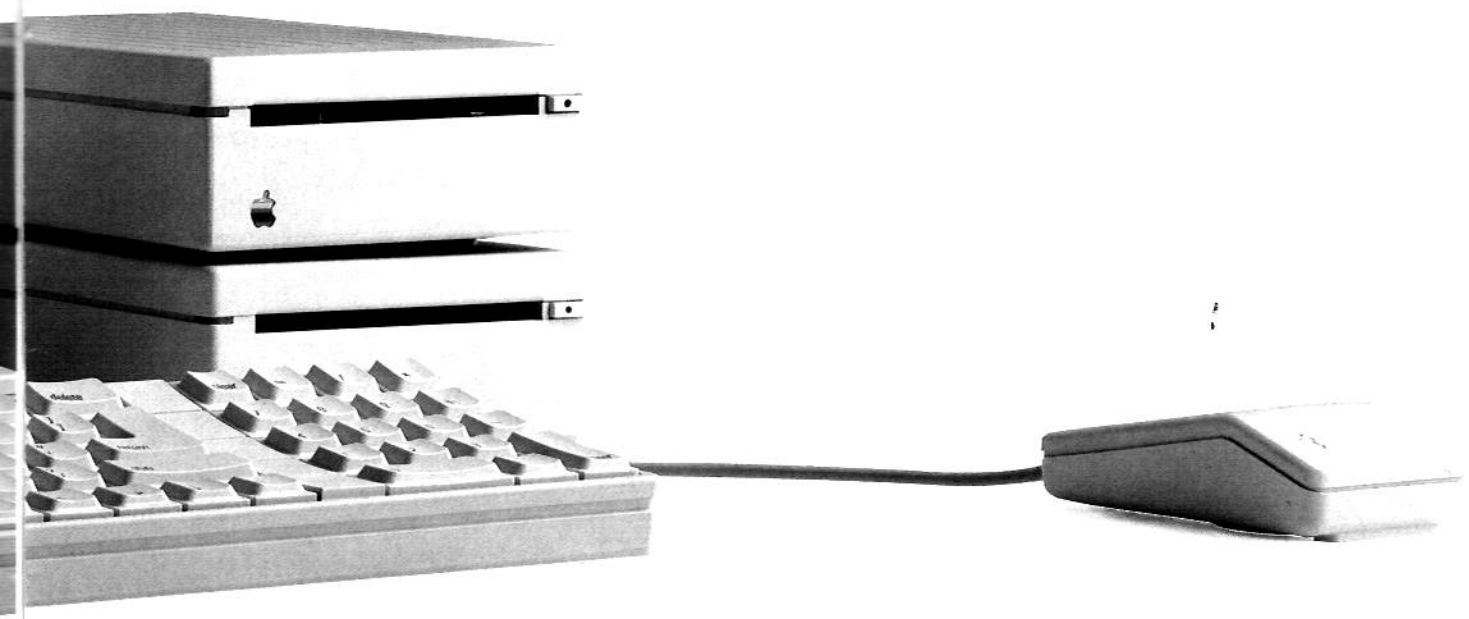
Close your eyes and listen to its 32-oscillator synthesizer, enabling it to reproduce sound as faithfully as it reproduces sight, from natural human speech to jazz compositions and film sound effects.

It has the power to meet the toughest problems that business has to face, yet with the same friendly approach of its famous brother, the Apple Macintosh.™ The mouse is free. And so is the software that makes managing your computerised information as easy as selecting papers from a desktop.

So, with almost a decade of success behind it, the new high-performance Apple II looks forward to a new generation of opportunities to show off its new talents. The possibilities are endless.



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Product: F-15 Strike Eagle
Price: £21.95
Supplier: Microprose, PO Box 24, Cirencester, Glos. Tel: 0453 886386
Requirements: Apple II, II+, IIe, with joystick

BILLED as America's number one fun combat simulator this is the very latest edition and includes the – wait for it – 'Anti-Terrorist Airstrike to the Shores of Tripoli 1986!'

I am really not so sure that a game should be so overtly political but then this is an American game and perhaps the name of the mission is not terribly important.

Right, let's get strapped into the ejector seat. First select one of the eight combat missions and then one of four levels of expertise (arcade, rookie, pilot or ace).

Before flying there is a real intelligence test – try and find the authentication code (it's printed in tiny letters spread through the instruction manual).

Now you are flying at mach 0.9 at 6,000 feet with an array of sophisticated displays including a 'Heads-Up-Display' projecting target and threat tracking information, navigational cues and status messages directly on to the plane's windscreen. There is also a range selectable radar, a ground map and a weapons status display.

Your job, as pilot, is not only to fly the aircraft but also to select the most appropriate offensive and defensive weapons, the best flight path to and from target and take part in high speed aerial dogfights. The simulation does not include take-off or landing.

If the flight operations manual is to be believed then this program is a faithful simulation of the F-15 attack fighter including all major flight, weapons and information systems.

I would say that a colour monitor and joystick are almost essential. So much of the screen information depends on the colour (blue sky, green land, red warning signals), and there is plenty of keyboard work controlling the weapons system – the pace can be so fast that you hardly dare let go of the joystick.

In comparison with something like Flight Simulator II this is very much easier to fly but there is plenty to think about. All in all a very good game with good graphics: fast moving, well documented and well presented. But perhaps I should leave you with the words of the Micro-Prose president "... Dedicated to the men and women, who build, maintain and fly one of the world's greatest aircraft at McDonnell Douglas and in the US Air Force. Remember the next time you hear a fighter jet go by – You are hearing the Sound of Freedom".

Bill Hammerton

European battles fought again

Product: Crusade in Europe
Price: £24.95
Supplier: Microprose, PO Box 24, Cirencester, Glos. Tel: 0453 886386
Requirements: Apple II, II+, IIe, IIc with 64k and joystick

THIS is another one of those excellent strategic simulation games from Microprose. Even for those who have not played strategy games before, Crusade in Europe will provide an excellent introduction.

The accompanying literature is particularly good with a manual of 55 pages including a full-colour map and extensive historical notes to accompany each of the five campaigns available plus 14 different variations – all of which, according to Microprose, are accurate.

The game puts you in command of either the German or the Allies in the battle for France and the Low Countries during the summer and autumn of 1944.

Scenarios include the battle for Normandy, from the D-Day landings to the liberation of Paris, the Allies' race to the German frontier, Operation Market-Garden, the desperate German counter offensive known as the Battle of the Bulge and a campaign game.

Most of the scenarios include a number of variants that take different amounts of

time to play or, interestingly, explore alternatives to the historical situation.

For example you can play 'what if' Hitler had not believed that the Alies main landing was to be at Pas de Calais. Perhaps there might have been a very different outcome to the war.

The game can be played by one player against the computer, or by two players against each other or even the computer against itself. With the varying degrees of skill, advantage, intelligence and ability that can be set, two players of widely differing abilities can still play a satisfying game.

Once you have decided on the battle and variant and entered the correct code response then battle begins. In contrast to most strategy games Crusade in Europe does not proceed by turns. Instead the computer conducts the activities of the units continuously, while a clock ticks away.

However the game can be frozen at any point and the speed can be altered from slow to medium to fast at any time. During the hours of darkness the map display changes from white to black and there are many other nice touches not normally found in simulations, such as multiple map scales, a flashback mode and intelligent units. Games can go on for fairly lengthy periods and there is a facility for saving up to 15 different game situations.

Another interesting feature is the overview map which will show on one screen the land and sea areas incorporated in the whole game map and the location of all units.

On the reverse of the disc is a 128k version that uses the double hi-res screen of the IIe and gives other added features such as changing the colour of the text area depending on which side are playing.

All in all this is a superb, complex, historically-accurate wartime strategy game. If you have any interest in the period or war games in general Crusade in Europe is a must for your collection.

Bill Hammerton

Program: Alternate Reality: The City
Price: £19.99
Supplier: US Gold, Units 2/3, Holford Way, Holford, Birmingham B6 7AX.
Tel: 021-356 3388
Requirements: Any Apple II with 64k

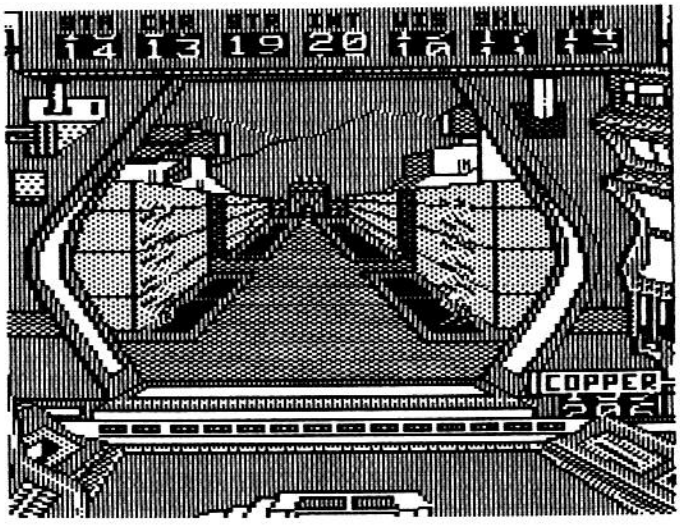
Not just another Wizardry clone

THERE have been many different (and some not so different) role-playing fantasy games on the Apple. Wizardry and its sequels are perhaps the best known, and most games follow the Wizardry style quite closely.

Alternate Reality does have points in common with the classic – you are wandering around in a maze gaining and losing various hit points and other character statistics. However it would be unfair to dismiss it as just another Wizardry clone.

The scenario starts where you have been kidnapped by an alien spaceship and transported to the City of Xebec's Demise. I have no idea who Xebec is (or presumably was) but I don't suppose it matters at the moment. It isn't my choice of a holiday resort.

Your kidnappers can't be all bad because you do have adequate clothing, some food and water, and a small amount of money. The actual amount of cash varies, but it is usually enough for you to purchase a compass (easily available at all shops and very useful) and a basic weapon if you bargain with the Smith. Be careful, however. If you annoy the Smith in your bargaining you can get thrown out and he has a long memory.



The gateway to the city

You start the game in a "room with only one exit". Through a crackling energy screen you can just see a city. Above the screen are constantly changing numbers in boxes labelled HP, WIS, INT and so forth. Any key press freezes the numbers and thus determines the vital statistics of your character.

It is possible to influence the starting variables a little. Most of the numbers are changing slowly enough for you to aim for a high figure. Hit points in particular don't tax your reaction time too much and I've managed up to a 23 – which, since they go as low as 03 and a single blow can cost you 4 points of damage, can alter your chances quite considerably.

Charisma points are harder to be selec- ▷

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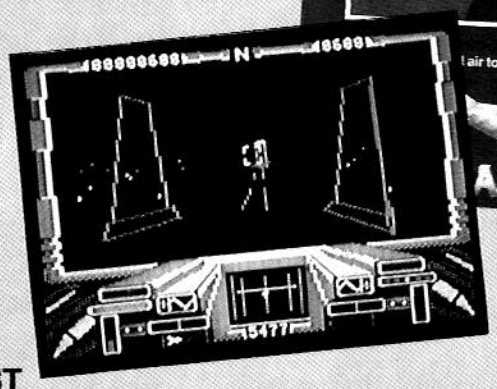

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✔VOTED America's No. 1 Apple game

TO ORDER PLEASE USE THE FORM ON PAGE 61

tive with, but it is interesting to aim for a high skill or intelligence level to see where it gets you. Unfortunately, I found this usually meant I ended up with a low number of hit points, so it never got me very far.

Your displayed characteristics are not the only variables in the game.

If you choose to kill off all the innocent commoners and walk away from nasty muggers your character will be labelled "bad" and this will have consequences for future encounters.

I suspect that other more subtle records of your interactions are also being kept, but Xebec's Demise doesn't have a "freedom of information" arrangement.

The object of the game isn't as straightforward as "kill the princess and rescue the evil sorceror" because The City is only the first of a seven-part series. The ultimate scenario is Destiny, where you have to decide whether to return to Earth or take revenge on your kidnappers.

In City you are aiming to build up one or more characters in order to take part in the next episodes. Apparently you need at least a level 10 characters to bother with the second scenario, the Dungeon, and I would guess that you had better buy more suitable clothing before you try the elevated social status of the Palace.

You enter the City with neither experience nor weapons which makes you fairly vulnerable. Fortunately the other inhabitants seem similarly incompetent at first. It is possible to overcome a swordsman wielding a long sword bare-handed, but this is not recommended. Unfortunately their weapons usually vanish on the owner's death, so it's not an easy way to build up an arsenal.

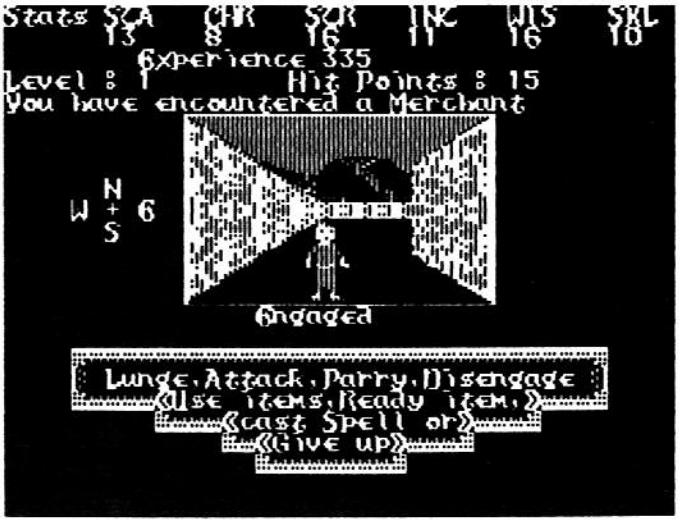
Each blow you land successfully gains you experience points, with an extra bit when your opponent dies. At about 300 points your character progresses to a level 1 status but you have to double your points to get to each successive level. Level 10 is going to take a lot of points!

You can either work with a temporary character or create a new being which can then be saved. A temp is fine to get around with and get the feel of the city, but you can't keep going indefinitely.

Unfortunately I found the save facility annoying. You can save a character on to your prepared disc but that ends that playing session. When you resume playing with the character it is wiped off your character disc.

In order to protect the work of several sessions you need to back-up the character disc. This is not hard, but is an extra bit of disc swopping and messing about which could have been dispensed with.

In some similar games – for example, Xyphus – you use the character disc in play, constantly changing the character, so it is understandable that a saved character will be changed. However, Alternate Reality does not use the character disc in play so I cannot understand why they have to wipe the character when play is resumed.



Alternative Reality: An encounter in the city

The City is a large maze of streets, alleyways, concealed areas and one-way traps. There are a number of shops, banks, smithies and other vital facilites which you need to be able to find – when night falls you need to know where the nearest inn is, assuming you can afford the board.

The whole City needs to be mapped and can be drawn on a 64 x 64 grid. I only found this out when US Gold kindly sent me a copy of the Alternate Reality Newsletter which referred to such a grid "provided with your game".

By devious means I got hold of the original Datasoft Atari version. The manual is virtually identical except for the inclusion of the grid, complete with the beginnings of a map. I found this invaluable and was quite annoyed that the review version did not contain it (US Gold please take note). The pretty picture map they sent is very nice, but not a lot of help.

The newsletter also told me that by squinting at the tiny display through which you view the City you can just make out vertical lines along the walls, each line corresponding to one square on the grid. It is not easy to spot the lines in the first place, and proved even harder on a IIc screen than the IIe monitor. Colour was no advantage.

Mapping the City is not only important in order to find various establishments while building up your experience. Access to future scenarios is via the City and you need to find the entrances to them within it. Also you need to use City facilities like banks and healers so the game will not be relegated to the back of the shelf once you've built up your version of Rambo.

Control is by keyboard only. The main movement keys are IJKL, which I found very convenient. Other keys are used for the various interactions, but you are prompted on-screen at the appropriate time. This was a welcome change from games which either expect you to memorise 26 or more different commands or spend all your time reading the manual.

On your travels around the City you are going to meet various life forms. In fact, the easiest way to meet them is to just stand still and wait. Your interaction is varied by who sees whom first, who saw whom the quickest, and so on.

"Good" forms are heralded by a lively tune and should be left alone if you want to develop a saintly character. Evil forms are heralded by ominous notes and should be exterminated if possible.

Apart from the advantage to your experience level there is the possibility of finding treasure, particularly if you venture out at night.

The music in Alternate Reality is described as "original". There are various ways of interpreting that! I hated it, especially when I found myself humming it in Sainsbury's. The other shoppers were only fortunate that I had not learned the words which appear on-screen in time to the music.

The sounds cannot be turned off which can be annoying to non-players in the same room.

The graphics are quite good and the scrolling around the 3D maze is smooth. The hi-res screens inside buildings are very detailed and a welcome change after wandering the streets.

Alternate Reality: The City is a large game. On its own it could keep you playing for some time, but the whole series could be a very long commitment. It is impossible to mention everything in a review, and like all games it has its good and bad aspects.

On the whole, I enjoyed it and will carry on playing it even after writing the review. I also look forward to having a go at the next episodes. Maybe by the time they arrive I'll have a strong enough character to play them.

Denise McKnight

Hacking around

Program: Hacker II
Price: £24.99
Supplier: Activision, 23 Pond Street, Hampstead, London NW3 2PN.
Tel: 01-431 1101
Requirements: Apple II with 64k and joystick

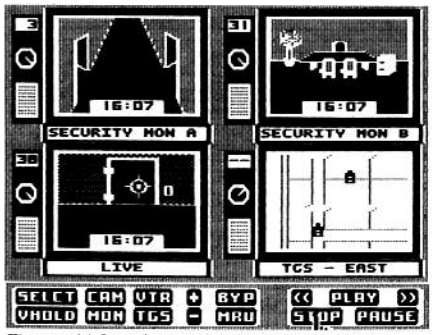
HMMM, what's this? "Logon please:". Now what sort of ID is it expecting? Here goes... hey, I'm in! Who said I couldn't hack my way out of a paper bag?

Well, that bit was easy, now what's on offer on this menu – wow, transmission interrupted.

It seems the CIA has recognised me as the world's leading authority on computer security systems and wants to enlist my help. Unless I succeed, a Russian plan could shift the balance of power and jeopardise the entire free world, not to mention Wigan.

With Big Ronnie in the driving seat, you may feel the balance of power could do with a little shifting, but you didn't get where you are today by entertaining such thoughts.

Fortunately you don't have to go to Siberia where the Doomsday Papers are located, because the CIA will lend you their satellite. That way you can use your computer – obvious, innit?



The multi-function switching matrix display

They've even managed to secrete a few Mobile Remote Unit droids around the place for you to control and have planted a Multi-Function Switching Matrix in the building to help you avoid detection.

It's a pity they didn't manage to get the Doomsday Papers while they were messing about with MRUs and MFSMs, but that's the CIA for you – they've made some pretty enormous real-life mistakes in their time, so why should they be any different in a game?

You are linked to the MFSM via the CIA's computer and satellite, and after a quick training session you can start to use it for real. As far as I can tell, you'll need a joystick. It's a superb display (see screen dump), and looks even better in colour.

The first thing I did was to try the video recorder and was amazed to find all the controls worked. By fast-forwarding the tape I was able to see at what intervals the guards patrolled, and then... but that would be telling, and I'm sure the CIA wouldn't want me to do that.

The biggest problem I had with Hacker II was thinking myself into its scenario. The old "Reds under the bed" threat may well still rouse some Americans, but not any of the ones I know. I also don't think the game would appeal to real hackers – they don't tend to bother with joysticks and they're too busy landing their parents with enormous phone bills – but if you're happy to dream that one day the CIA may interrupt your session on the local bulletin board, you might as well play Hacker II while you're waiting.

Dave Russell

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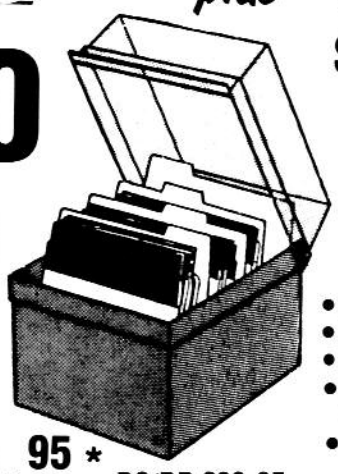

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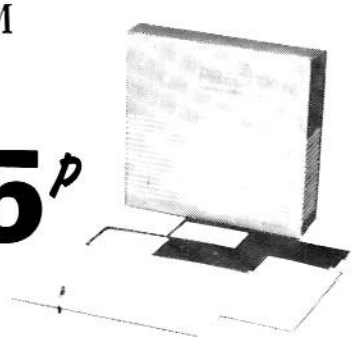

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It pays to increase your word power

Geoff Wood looks at an AppleWorks accessory that takes the guesswork out of spelling

DO you use AppleWorks and are you a poor speller? If so, the Pinpoint Pop-up Spelling Checker may be just the thing for you. It checks the spelling of any AppleWorks file while the document is currently on the screen.

The Spelling Checker's dictionary contains about 56,000 words, but you can also create your own dictionary of words that are not in the main file.

With other spelling checkers for Appleworks you have to save your file, quit AppleWorks, boot up the spell checking program, reload the file, search the dictionary, correct the errors, and so on.

With the Pinpoint package all you do is hold down the Closed Apple key, press P, and select the Spelling Checker from the Pinpoint menu. It's as easy as that.

The Pinpoint accessory program (reviewed in *Apple User*, September 1986) offers AppleWorks users the facility to have a notepad, a calculator, an appointments calendar, a communications program, an automatic dialler, a facility for merging graphics with text, an easy way of printing addresses on envelopes or cards and the ability to use your printer like a typewriter.

Any one of these accessories can be selected from a pop-up menu after you press Closed-Apple-P.

Installation

The spelling checker is a separate program from the Pinpoint accessory one, but you need to buy both because the spelling checker must be installed as an accessory within Pinpoint. Although Pinpoint can be installed on other programs, the checker operates only on AppleWorks. The checker comes on two sides of a write-protected disc but it is not copy-protected. First you must copy the discs so that you can configure the program to meet your needs. The 48 page manual gives reasonably clear instructions about installation and operation of the program.

The first step is to boot up the installation disc. (the second disc simply holds the dictionary files). After a graphic demonstration of spelling correction, the screen offers an installation menu similar in appearance to AppleWorks. The first item on this menu asks you to specify your version of AppleWorks. The program works with four versions, 1.0, 1.1, 1.2 and 1.3.

Next the installation menu asks you to set default options for the spell checking mode. These can be changed temporarily after the program has been installed, but if you want to change the default options permanently you must reinstall the program.

The first default option checks the spelling of a single word rather than all the words in a complete paragraph or a document. The second default option leaves the sound turned off rather than beeping every time it checks a word. The third default option displays alternative spellings from the dictionary, but this facility can be turned off if you prefer.

The fourth option offers summaries for each paragraph; the default option is off. The fifth default option gives a summary of the whole document, telling you how many words were checked, how many suspect words were found, how many corrections were made and how many words were added to your own dictionary.

The sixth option offers a word count only; the default option is off.

Standard location

Having set the default options, you then revert to the installations menu and choose its third item, which allows you to specify the standard location of the dictionary files. The default is drive 2, but if you have a hard disc or a ram disc you can enter a suitable Prodos pathname.

The fourth item on the installation menu enables you to install the checker on the Pinpoint installation disc. It copies a file from the checker disc to the Pinpoint disc.

The final step is to install the updated Pinpoint program on your AppleWorks startup disc. Pinpoint is compatible with expanded versions of AppleWorks such as Applied Engineering's RamWorks, RamFactor and Z-Ram and Checkmate Technology's MultiRam, so you can use an AppleWorks startup disc that has already been expanded for a ram drive.

Once the installation is complete you can boot the AppleWorks startup disc, insert the program disc and use AppleWorks in the normal way. When you are ready to check some spelling you invoke the Pinpoint accessories menu with Closed-Apple-P and select the Spelling Checker from the menu.

At this stage, if you are not using a hard disc or a ram drive with the checker files already installed, you should put the checker installation disc in drive 1 and the dictionary disc in drive 2.

Charging defaults

The manual recommends saving your file before you start checking spelling. You may also wish to change some of the default options. If so, press Closed-Apple-M. A pop-up menu appears from which you can temporarily change any of the options. This menu also offers you the opportunity to opt out of the checker.

When you are ready to check some spelling, you simply locate the cursor where you want to start, hold down the Closed Apple key and press P. The word where the cursor is located is highlighted in inverse and the program refers to the dictionary to check the word. It will either accept the word (if it matches one in the dictionary) or it will display a panel offering various options.

If the program is set to offer alternative spellings, the panel displays a list of up to 10 alternative words and you can select one if you wish. (The program is smart enough to replace upper and lower case letters with the correct case.)

Alternatively, you can edit the suspect word using normal AppleWorks keystrokes for text editing. Or you can add the suspect word to your personal dictionary or simply press the Esc key to proceed without changing the suspect word.

If the program is set to spell check a paragraph or a document, each consecutive word is highlighted as it checks away. When the program comes across a word that does not match, it pauses and displays the panel of options. You must then make a ▷

◁ choice before it proceeds to the next word.

This means that if you set the program to spell check a long document and then go off to do something else, you may return to find that it has discovered an error on the first page and has paused there awaiting your instruction.

Other spell checking programs such as Sensible Speller can be left to check a whole document and give you a list of suspect words. You can then go through the list of words one at a time and either accept a suggested alternative, edit the word, add it to a dictionary or leave it as it is.

However, Sensible Speller does not operate from within AppleWorks. You have to quit AppleWorks, boot up the spelling program and load the file you wish to check.

With the Pinpoint Spelling Checker in paragraph or document mode, if you have asked for a paragraph or document summary, when it has completed checking a paragraph or document it displays a panel showing the total number of words checked, the number of suspect words found, the number of corrections made and the number of words added to your dictionary.

Journalists and writers may find the word count useful. You can have a word count without the spelling check if you wish.

Trial and error

The manual does not explain that the search mode and the summary mode must match – I discovered this by trial and error. If you want a summary at the end of a document, the program must be set to spell check in document mode and to give a document summary. Similarly, if you want a summary at the end of a paragraph, the program must be set to spell check in paragraph mode and to give a paragraph summary.

If the program is set to spell check in document mode and to give a paragraph summary, it ignores the latter instruction. Similarly, if it is set to spell check in paragraph mode and to give a document summary, it ignores the latter instruction. If it is set to spell check in single word mode, it will not give either a paragraph summary or a document summary, even though one or both of these may have been requested.

Paragraphs are spell checked from the cursor position to the first blank line. If there are no blank lines between your paragraphs it spell checks from the cursor to the end of the document.

While spell checking a document in paragraph or document mode, you can halt the process by pressing the Esc key. You will not then get a paragraph or document summary.

The Pinpoint Spelling Checker is not limited to checking word processor documents; it can also check words in an AppleWorks spreadsheet or database. According to the manual, these cannot be checked in paragraph or document mode; the program must be in word mode and you must locate the cursor in the cell or field you wish to check.

However, I found that you can print the spreadsheet or database file on to the clipboard, paste it into a word processor document and check it in paragraph or document mode.

Limitations

The program only checks spelling. If you type "their" instead of "there", or "to" instead of "too", or "you" instead of "your", or "it" instead of "is", it will not identify your mistake. If you type "Paris in the the spring", it will accept "the the". Even on spelling, it is not entirely foolproof; it accepted "his's", "her's", "their's", "our's", "mine's" and "your's" and some wrong plurals such as funs.

Also, like many other spelling checkers, the Pinpoint program is American, so its dictionary includes words like color and labor, but not colour and labour. The program does not accept words like recognise, organise and other words ending in "ise" that the Americans spell with "ize". Nor does it accept defence, offence and pretence which the Americans spell with "s" instead of "c".

It thinks that words like appal, fulfil, instil and skilful should have double "ll". It doesn't like the "e" in likeable, liveable, rateable and saleable. And it suspects words like calibre, centre, fibre, litre, metre, spectre and theatre that the Americans spell with "er" instead of "re". However, you can expect to have similar problems with most spelling checkers.

The answer is to put these English words into your own dictionary file. The process of spell checking a word takes slightly longer when it can't find the word in the main dictionary and looks in your own dictionary file. This is created as an Ascii text file so you can inspect it via AppleWorks and delete words if you wish.

The biggest drawback to some spelling checkers is that they tend to be slow. This is certainly true of Pinpoint's checker if you operate it from floppy discs. The program works faster from a 3.5 inch disc or, better still, a hard disc. The fastest way is to load the program and dictionaries into a ram disc. Indeed, the advertisements do say that "Pinpoint and the Spelling Checker are particularly suited for use with extended memory cards".

I used the Spelling Checker to check this article. In document checking mode it took almost 45 minutes with two floppy disc drives and 27 minutes with programs and dictionary in a RamFactor ram card. With a TransWarp accelerator card and the ram card it took only 11 minutes.

The document summary said that there were 2335 words of which 40 were suspect. More than half of these were in the paragraph about the differences between American and British spelling. It also challenged AppleWorks, Ascii, Exc, MultiRam, Prodos, RamWorks, RamFactor and TransWarp, but it accepted Pinpoint as a word. The other words questioned were clipboard, dialler, etc, notepad, pathname and spreadsheet.

I also used it to get a word count without the spell check. It took 20 minutes with floppy discs and the same time with the program in the ram drive. With the accelerator card it took only eight minutes.

I then checked the article with Sensible Speller. With the program and dictionary on floppy discs it took less than three minutes to collect and check the 2335 words. With the program and dictionaries in the ram card it took only one minute.

However, these times are only for spell checking. The process of editing the suspect words is separate. This took three minutes with floppy discs and two minutes with the program and dictionaries in the ram card.

The combined times are much faster than with the Pinpoint package, but they do not include the time needed to quit AppleWorks and boot up the Sensible Speller program. Even so, Sensible Speller is much faster.

Advantages

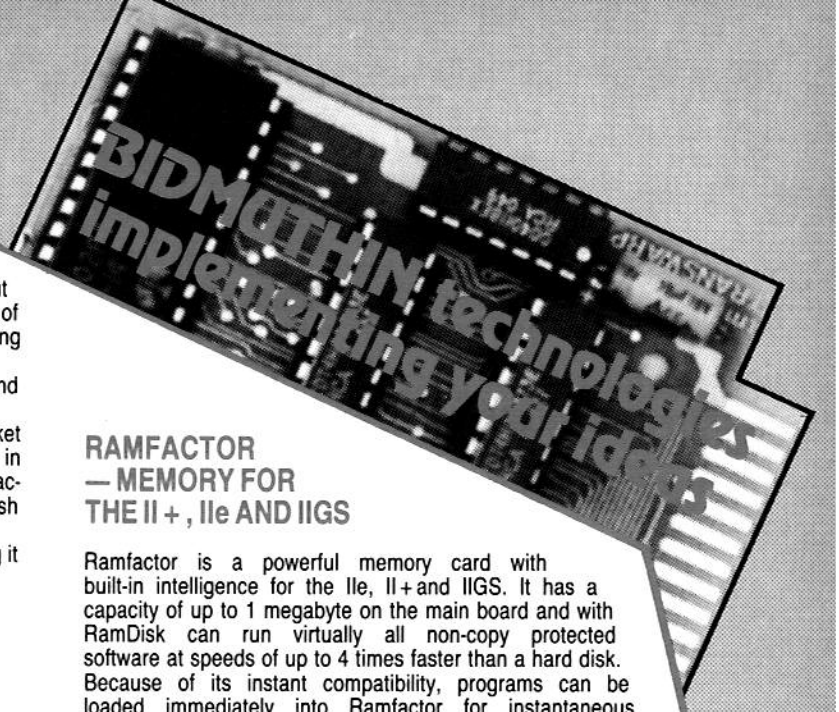
One of the advantages of the Pinpoint offering is that it can be so readily adapted to different modes to suit your needs. You might prefer to use it in the single word mode just to check an occasional word when you are not sure of the spelling. With floppy discs, this involves changing discs so if you want to use it this way it is better to have a hard disc or ram disc.

You may prefer to check each paragraph as you go along. However, to save changing floppy discs you really need a 3.5 inch disc or a hard disc or ram disc.

If you are a reasonably good speller, you can turn off the option to suggest alternative spellings. This speeds up the checking process. You can then correct most of the suspect words from your own knowledge and turn the option on temporarily for the occasional word about which you are not sure. Or you might be happy to just have the word count.

Despite a few shortcomings, this is a good program. It is almost a must for AppleWorks users who are poor spellers, and a useful accessory even for good spellers.

The Pinpoint Accessory Program cost £69, as does the Spelling Checker. Both are available from Bidmuthin Technologies, PO Box 264, Harrow, Middlesex HA3 9AY. Tel: 01-907 8516. □



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RAMWORKS — MEMORY FOR THE APPLE IIe, FROM 256k to 3 MEG

Ramworks is the memory card for Appleworks on the IIe. Ramworks is compatible with all IIe hardware and software and it expands all of Appleworks' facilities including the database to over 15,000 records, the word processor to over 15,000 lines and the clipboard to 2,000 lines or records. It even allows you to auto-segment files larger than one disk capacity onto two or more disks, and displays the time and date on Appleworks' screen with any ProDos compatible clock.

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Ramfactor is a powerful memory card with built-in intelligence for the IIe, II + and IIGS. It has a capacity of up to 1 megabyte on the main board and with RamDisk can run virtually all non-copy protected software at speeds of up to 4 times faster than a hard disk. Because of its instant compatibility, programs can be loaded immediately into Ramfactor for instantaneous access to information. With the optional battery back-up, Ramcharger, data can be stored almost indefinitely and you can even "boot" directly from Ram. Ramfactor also allows you to switch between different programs automatically and it will even allow you to run Appleworks on the II +.

Price – 256K — £239.00, 512K — £289.00, 1 Meg — £369.00(Ex VAT)

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The Pro-App is the only hard disk that will run safely on the entire range of Apple computers including IIe, IIc, the new GS, Mac and Mac +. It plugs directly into the Smart port of the GS or the external disk drive port of a IIc or the back of a 3.5 inch disk drive, thus saving a valuable slot for further upgrading. It's also ideal for use with the Uni-Share network which links the GS with the IIe and IIc and is available in 10 megabyte, 20 megabyte and 40 megabyte versions.

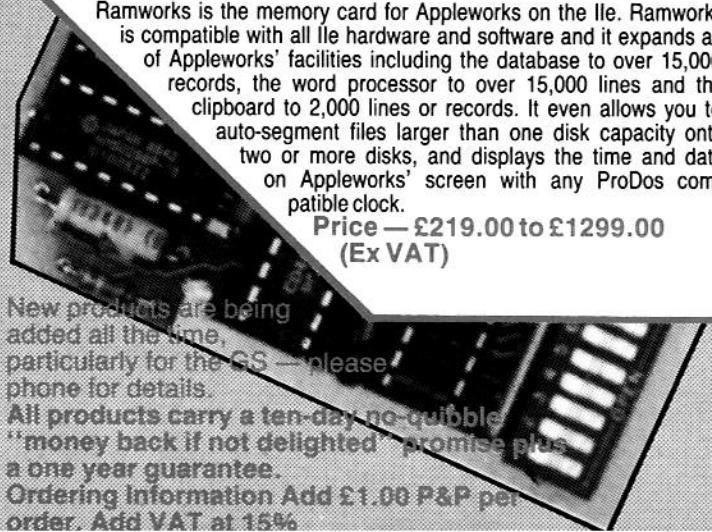
Price — from £795.00 (Ex VAT)

GS-RAM — THE MOST POWERFUL MEMORY BOARD FOR THE IIGS

GS Ram adds extra memory, up to 1.5 megabytes and expands Appleworks by vastly increasing the size of its database, word processor and clipboard functions. It loads Appleworks automatically for faster operation and has a variable size printer buffer. Therefore your Apple can continue with other work while still printing. Like Ramworks it allows files larger than one disk capacity to be spread over two or more disks and it has an automatic time/date display and entry into the database.

With the 1 meg and 1.5 meg versions of GS Ram, Pinpoint 2.0 is included free.

Price — from £169.00 to £379.00 (Ex VAT)



New products are being added all the time, particularly for the GS — please phone for details.

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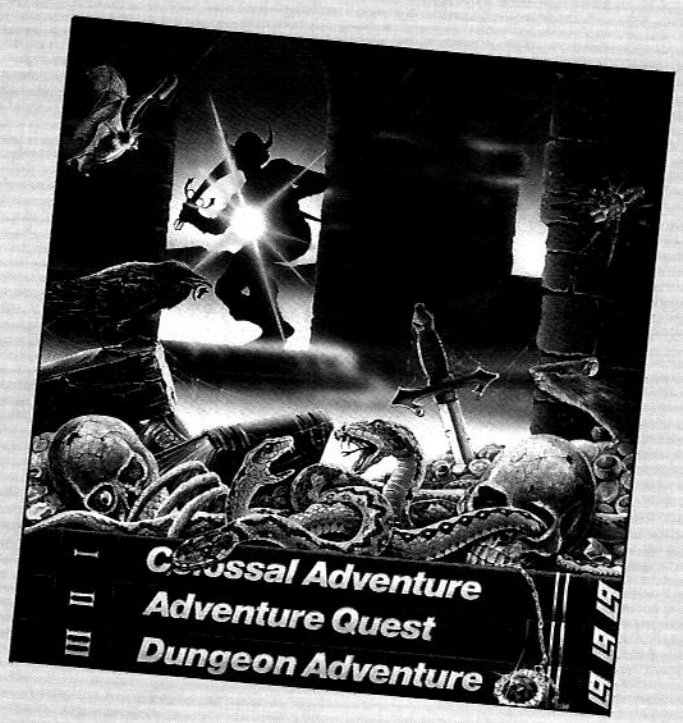

The first adventure in the Silicon Dreams trilogy is Snowball. You awake from suspended animation to find your spaceship on a collision course with Eden. In Return to Eden you must prevent the defence robots from destroying your ship. You have lost your memory in the Worm of Paradise, and you may have to join the governing party to regain it.

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TO ORDER PLEASE USE THE FORM ON PAGE 61

Ram enhancement

Geoff Wood reviews a kit that gives more flexibility to AppleWorks

DO you use AppleWorks with a ram card such as RamWorks, MultiRam or Z-Ram? If so, the Pinpoint Ram Enhancement Kit may be useful to you. This program allows you to partition the ram card so that AppleWorks does not hog all the ram on the card.

With a 1024k card, or even 512k, you may not need the full size of desktop offered by the expanded version of AppleWorks. Instead, you may prefer to use part of the ram card to store other programs or data.

The kit also enables you to set up an AppleWorks startup disc that creates a ram drive to your specification. It can also automatically load specified files into the ram drive during the process of starting up.

So if you use the same files every day, you do not have to start from scratch with the enhancement kit, you simply boot your adapted AppleWorks startup disc.

In order to use the kit you must have the Pinpoint Desktop Accessories program (reviewed in *Apple User*, September 1986). You can also use it with the Pinpoint Spelling Checker (reviewed in this issue). Pinpoint programs need either an Apple IIc or an enhanced Apple IIe.

The first step in setting up a system is to enhance a copy of your AppleWorks startup and program discs with either Applied Engineering's Super AppleWorks Desktop Expander (version 3.3 or higher) or Checkmate Technology's AppleWorks Expander (version 4.3 or higher).

The next step is to use the Pinpoint installation disc to install the accessories program on the expanded version of AppleWorks.

Five options

The third stage is to boot the ram enhancement kit disc. This produces a menu on the screen, similar in format to the AppleWorks main menu, with five options.

The first option lets you specify which of the Desktop Accessories you want automatically copied to the ram drive at startup. The default for this option is to copy all except the dialler. If you prefer, you can set up AppleWorks without the Pinpoint accessories, but you still need the Pinpoint installation disc in order to set it up this way.

The second option lets you enter the pathnames of up to 16 files that you wish to copy automatically to the ram drive on startup. These could include data files for the Pinpoint Desktop Accessories, the dictionaries for the Pinpoint Spelling Checker, some AppleWorks data files and/or files for other programs such as Apple Writer, SuperCalc 3a or other Prodos-based programs.

The third option lets you set other characteristics of the ram drive such as its type and size, the location of the startup file and the exit file location.

The kit works not only with RamWorks, MultiRam and Z-Ram but also with the AST Research Sprintdisk and the Apple memory expansion card. However, if you specify the latter, you cannot partition the ram drive.

Although Applied Engineering's RamFactor card (reviewed in *Apple User*, January 1987) is not listed as one of the ram cards, the enhancement kit treats it as an Apple memory expansion card.

The ram drive size can be varied from 128k to 960k in steps of 64k up to 384k and thence in steps of 128k to 768k. Of course, you must not specify a size that is larger than your ram card. The larger you make the ram drive, the smaller will be the AppleWorks desktop.

Default for the startup prefix is /APPLEWORKS and default for the startup path is APLWORKS.SYSTEM. You may wish to change the prefix if you have a suitable version of AppleWorks already on a hard disc or 3.5 inch unidisc.

You can specify the exit prefix and path if you wish. On the enhancement kit disc is a program called Ram Switcher which can be used as a means of switching from AppleWorks to other programs on the ram drive. To use it you would specify a suitable prefix such as /RAM and the pathname RAM.SWITCHER.

If you use the Ram Switcher you should copy the program to your AppleWorks startup disc and include the pathname /APPLEWORKS/RAM.SWITCHER in the list of up to 16 files entered under the second option. This ensures that it is automatically copied on to the ram drive at startup.

If you have only one program on the ram drive, you need not use the Ram Switcher, but simply use an exit pathname such as AW.SYSTEM for AppleWriter or SC3.SYSTEM for SuperCalc.

The fourth option on the menu enables you to create a startup disc. If the type of ram card you have specified is RamWorks, MultiRam or Z-Ram, you will be asked to place the AppleWorks expander disc in drive 1 so that the ram enhancement program can access the ram drive software on this disc.

Finally you will be asked to place your AppleWorks startup disc in drive 1 and press any key. This disc will then have a new startup file created by the name PREBOOT.SYSTEM.

For hard disc or unidisc users there is an option to specify a Prodos path under which this file will be placed. In this case, it will not act as a startup file.

Once you have completed the installation, all that remains is to boot your new AppleWorks startup disc and, when necessary, insert other discs from which it will copy the files you have specified.

You can then use your expanded AppleWorks in the normal way but with a reduced size of desktop. You can also access any AppleWorks data files on the ram drive, amend them, and save them to the ram drive if you wish.

Copies needed

Of course, if you load data files into the ram drive and then use AppleWorks to make alterations to them, you must save or copy them to floppy or hard discs before turning off the computer, otherwise you will lose the revised versions of the files.

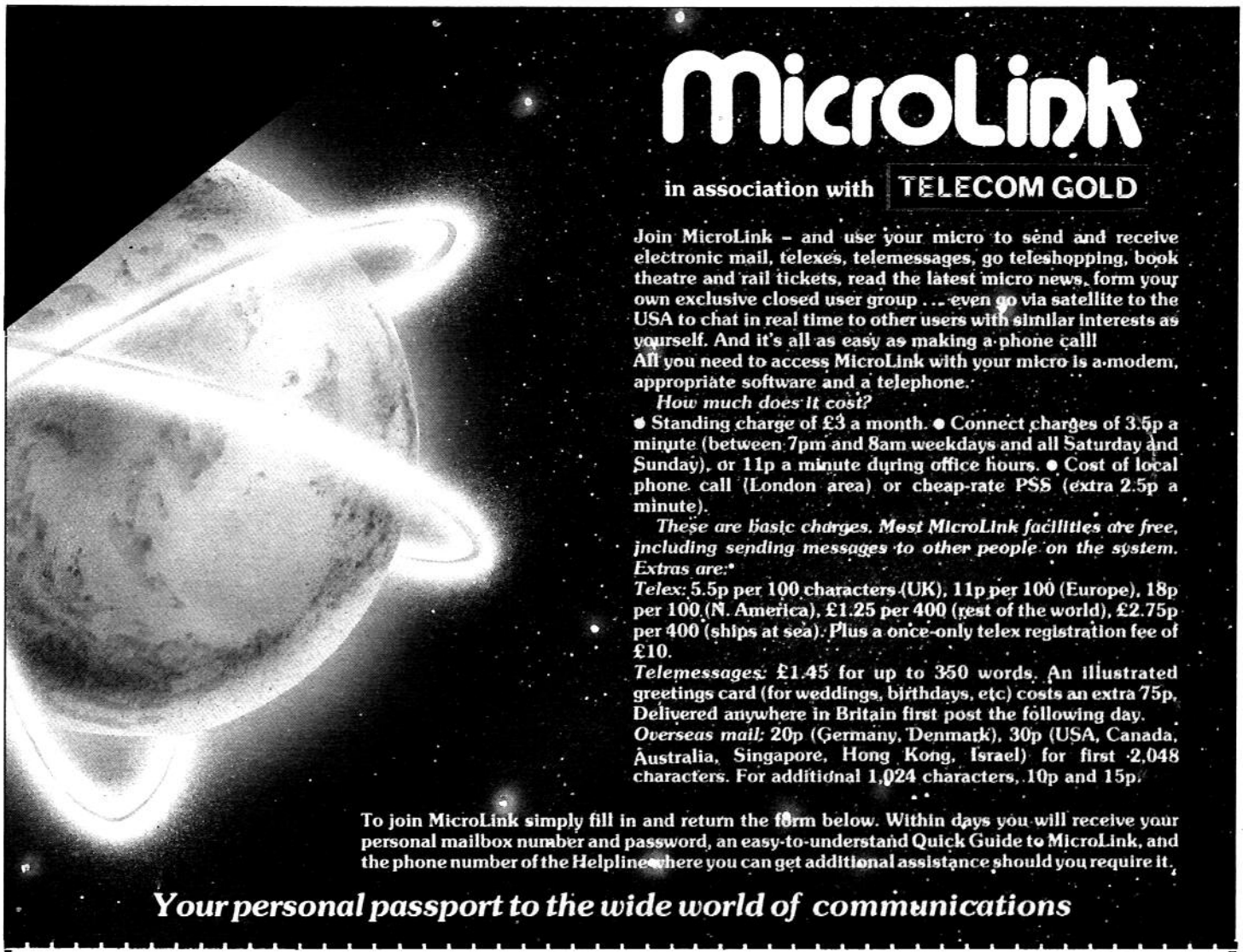
When quitting AppleWorks via the main menu, it will automatically follow the prefix and path you have specified, either to the Ram Switcher or direct to another program. The Ram Switcher displays a menu of startup files for the programs in the ram drive. You can use the arrow keys to highlight the startup file you want, then press Return.

Unfortunately, when you have finished using any of the programs in the ram drive, you cannot switch back into AppleWorks from the Ram Switcher; you must reboot the computer and reload the programs. In my view this is a major drawback.

The main advantage of the Pinpoint Ram Enhancement Kit is that it lets you partition the ram card (provided it is in the auxilliary slot) and then use part of the ram card as a ram drive with expanded AppleWorks in the remainder.

There is little point in buying it if you have an Apple Memory Expansion card or a RamFactor card or similar card that fits into one of the main slots, although it does offer an easy way to copy a specified list of files into the ram card.

The Pinpoint Ram Enhancement Kit is available from Bidmuthin Technologies, PO Box 264, Harrow, Middlesex HA3 9AY. Tel: 01-907 8516, price £29. □



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AU4

The idiot's guide to desktop publishing

Roger Jones learns the rules of a whole new ball game

I WISH when I started with my Macintosh that there had been a book bearing the appelation above. Maybe then I would have been able to avoid falling into all the traps and pitfalls that I found on my way to producing my first publication.

Perhaps I should begin by explaining how I came into desktop publishing in the first place.

I work for an educational technology supplies company called Commotion as technical manager. One of my many jobs is to prepare publicity material, technical notes and hand-outs on our products. We also produce our own catalogue, and to keep it up to date it was decided to distribute a quarterly newsletter containing catalogue changes, articles and technical tips.

Up to now all our paperwork was produced by traditional paste up methods, using outside professionals for the major publications, with all the attendant problems of cost and time delays that that brings. So it was decided to try using the Macintosh to produce all our in-house publications.

A Mac Plus was obtained and supplied with MacWrite and MacDraw. After the boss had spent a few days playing with his new toy it was installed on my desk with instructions to "get on with it!"

The first job was to re-write the construction manual for one of our robot arm kits. I already had some experience with micros, and as a reasonably competent two finger typist I thought that I had a few advantages over the complete novice – but I wasn't prepared for the Macintosh.

Throw away all your conceptions about operating a micro, this one is different. I started by taking the guided tour, and the further I got the more impressed I became.

The first and probably most important thing to take on board was the desktop filing system which, after the more familiar filing systems I was used to, was a joy once I had stopped trying to drive the Mac like an ordinary machine.

Emboldened by these first successful steps, I started on the robot arm manual. Writing the words presented no real problems, MacWrite is the easiest word processor I have ever used, but this also led me into the first trap – not taking enough backups.

Because the Mac is so easy to operate and can take such vast amounts of input in one go, the periods between saving the information to disc and taking backup copies becomes longer and longer. Lulled into a false sense of security by the ease of input and the apparent infallibility of the Mac, I sat bashing away at the keyboard for more than two hours.

There were eight pages of elegantly typed and edited text on the screen when there was a power failure, and with a small strangled cry of despair I watched my work shrink to a tiny spot in the centre of the screen and disappear.

Lesson one had been learnt.

Lesson two was a little longer in finding its way home. The manual was to have a number of thumbnail sketches inserted in the text to illustrate it, and these were contructed in MacDraw. At first I rather laboriously transferred these drawings from drawing program to word processor by copying them to the clipboard and pasting them into the text at the appropriate place.

This worked fine for a while, although it was a very long-winded process, until a friend lent me his copy of Switcher to try out. What an improvement. But another pitfall lay in wait for me. Once again I was trapped by the deceptive ease of operation of the Macintosh into making my files too long and complicated.

Even though I was saving files regularly now, and all the disc operations were going without a hitch, when I came to print them out the system kept crashing. I'm still not sure exactly what I was doing wrong, but after much heartache and splitting of the files into smaller and smaller units I finally managed to get a printout.

The text and pictures were all arranged in single columns and then pasted up by hand to produce two columns to a page for the first rough copy of the manual. This was presented to the other members of the office for criticism and was received with much interest.

I then took the disks up to Cambridge where a friend had a laser printer to get ▷

Ready,Set,Gone!

LETRASET, the instant type giant, has become a major force in desktop publishing by acquiring worldwide rights to Ready,Set,Go!3, the latest page design and layout program from Manhattan Graphics.

The package provides a combination of text composition, word processing and page layout functions.

Its block formatting feature allows users to select from eight pre-set grids or to create an unlimited number of customised grid settings.

Ready,Set,Go!3's format allows blocks of text or graphics to be positioned anywhere on the page.

The software includes a Linker tool allowing text to flow automatically to other blocks or pages throughout the entire document.

The user can also create layout templates that can then be reproduced automatically on multiple pages.

Other features include the importing of formatted text from programs like MacWrite and Microsoft Word, realtime hyphenation, kerning, automatic hyphenation, text wraparound, realtime text reflow around graphics, ability to open multiple documents for cutting and pasting, plus PostScript compatability.

◁ some better quality printouts. There I ran straight into the next set of problems. First the typeface that I had been using on my Imagewriter would not print on the laser-printer, and when I substituted the fonts the page breaks were all out of position. I went back into the files and re-set all the text, only to find that all my sketches now looked awful.

Where lines had joined previously there were now great gaps, and my carefully free-handed curves were all ragged and bent. The resolution of the laser printer is so good that any imperfections in the original drawings will be highlighted and emphasised in the printout. Oh well, back to the drawing board for a bit more editing.

Finally the manual was finished and everyone was very impressed with it. Orders started flooding in for forms and documents for use in the office, and it was decided to write the newsletter for the January High Technology Show on the Macintosh.

To help with this it was decided to buy PageMaker. This is one of the most powerful programs I have ever encountered, and it took some time to get used to it.

The first problem was that, quite naturally, it was aligned for use with the Laserwriter and attempting to make printouts on my Imagewriter gave forth some very strange results indeed. However after a few phone calls to Logotron, our friendly local Macintosh dealer, this was sorted out and some sample pages started to appear.

Up to now all the work done on the Mac was in the form of text or drawings, and very little was needed in the graphic design area. PageMaker put us into a whole new ball game, and with little or no experience in laying up a newsletter my first efforts were, to say the least, pretty awful.

The biggest trap I fell into was to try to use all of the very considerable number of typefaces and graphic features in the same document, if not all on the same page.

No matter how many times you do it yourself, you can never remove those mistakes you thought were right. (I still think parallel looks better with two r's).

Anyway, I hope that I haven't put you off, because that was definitely not my intention in writing this article. Desktop publishing on the Macintosh is straightforward, relatively simple and very enjoyable. I hope that by recounting my early experiences and blunders I can help you avoid the same mistakes.

Maybe some day I'll even write that book, but it will need a new title. Any suggestions?

Pagemaker techniques

Peter Gee leafs through a book that refreshes parts the manual can't reach

THE spread of desktop publishing (DTP) has brought the anticipated flock of books, and one of particular interest to Macintosh owners is Desktop Publishing by Andrew Lucas, which is aimed specifically at the Mac owner intent on entering the new field with the aid of Aldus Pagemaker.

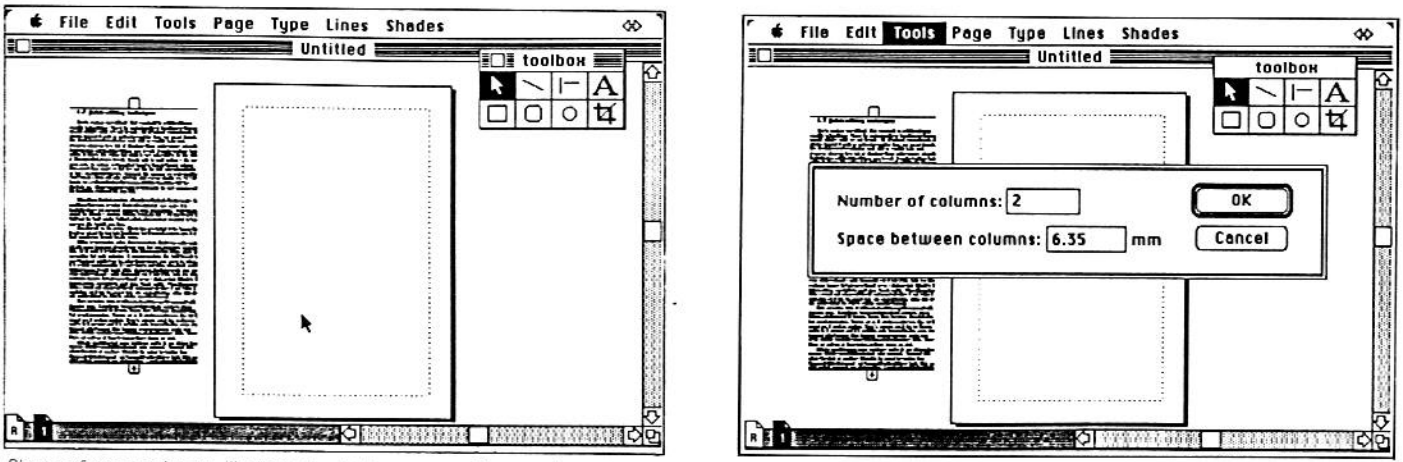
Now manuals, even such excellent ones as are provided with Pagemaker, are all too often skipped through perfunctorarily and consulted when all else fails.

On the other hand, books, the good ones that is, tend to command a more methodical front cover to last word approach. Let's face it, a book is a good read. And Desktop Publishing is all of that and more.

It presupposes no prior knowledge of either desktop publishing or the equipment used. It starts off with a useful glossary – a workmanlike approach maintained to the end. Who wants to keep trotting to the back of a book for information on a baffling word which should have been explained right at the start?

The opening section takes a fairly cursory look at the general DTP scene – its economics, uses limitations and future. The actual application of technique, design and style and so forth is left to other authors – Desk Top Publishing. The Book, by Tim Hartnell for instance – as Lucas sets his sights on the primary target of showing how to use the nuts and bolts of Pagemaker.

He first has a good look at the hardware required, and here makes the point, which



Plenty of screen dumps illustrate the trickier parts of Pagemaker – in this case running text into a page

Breaking new ground

THE Macintosh has broken new ground in a move which could bring another revolution in the newsaper industry.

The machine forms the heart of Dialtext, an editorial system devised by Talbot Computers of Dorset.

It employs NewsWrite software which allows standard editing from the keyboard and supports multiple windows.

The screen displays the number of characters and lines in the story. It can measure how deep the text would be when set in a variety of types and sizes.

The first paper to install the system was the Poole Advertiser series.

It took just 24 hours to make the switch from typewriter to computer keyboard.

On that first day, the nine journalists responsible for four titles around Poole were split into three groups and given a two-hour training session.

Next morning they sat down to Macintosh terminals to use NewsWrite. The following week a sister system was installed at the company's Southampton office.

At that stage, the journalists were turning out hard copy which was being set in the traditional way by print workers.The aim

Alex Cummings with Free Newspaper. Reporter of the Year Jan Fox – and Mac

Aldus fails to dwell on, that you need a hard disc if you are going in for moderately ambitious work. Expensive perhaps, but it would speedily recover its cost in time saved avoiding the frequent disc swapping necessary when using two floppy drives (doubly so if they happen to be of the 400k variety).

The chapter on getting started takes you right through from the moment you unpack and connect together all the gear. And from this point on the book gladly espouses the theory that one picture is worth a thousand words.

We are taken through the whole Pagemaker process with a maximum of screen dumps and only the words necessary to link them into a smooth guided tour.

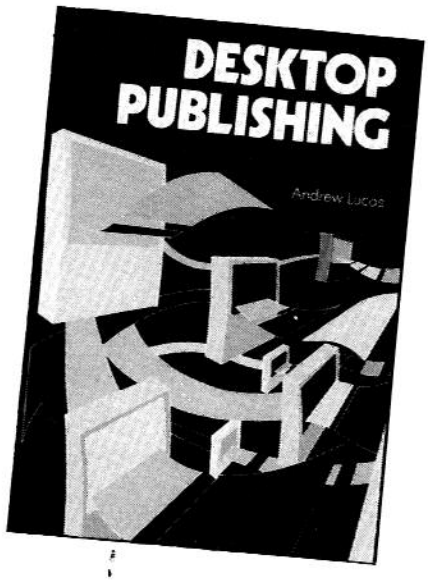
I find this technique brings the whole operation far more vividly to life than does the Pagemaker manual, although both contain, in general, the same facts. No doubt someone will count up the facts in both and prove me resoundingly wrong. But that begs the question, I read a book and only consult a manual.

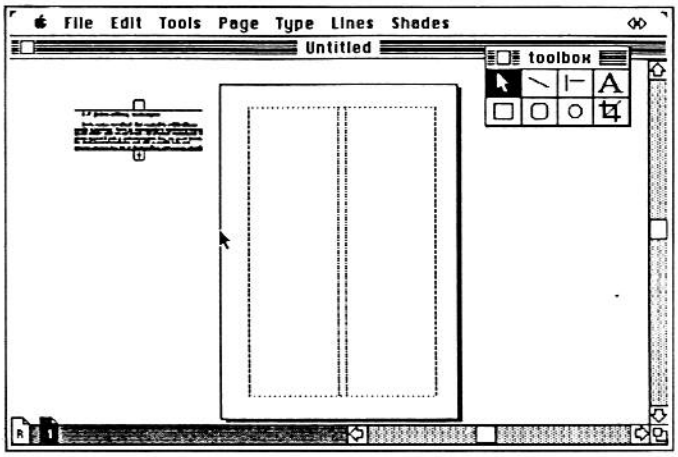
I picked up a lot of useful tips in the chapter dealing with Pagemaker techniques. One interesting point I hadn't seen mentioned before was the author's discovery that repeated text format changes tend to produce corrupted text files within a document.

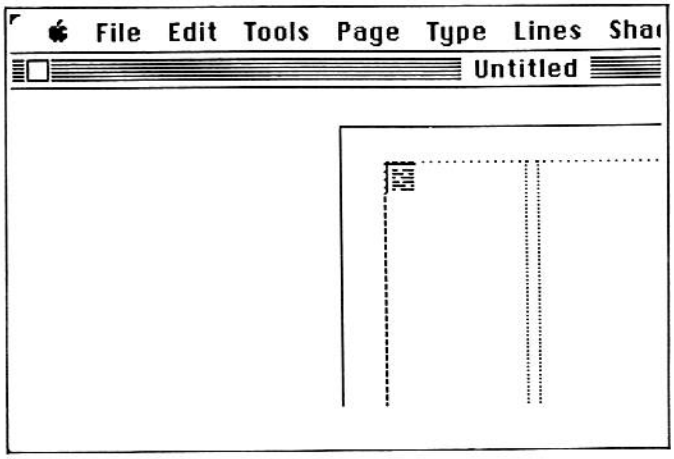
Perhaps we are not entirely to blame when things occasionally go haywire.

There are further chapters on MacWrite, MacDraw and MacPaint, plus an intriguing section on FullPaint, something I have yet to see. Finally, a cursory glance at Microsoft Word completes this excellent 200 odd word book.

It will undoubtedly smooth the way wonderfully for anyone completely new to the Macintosh way of desktop publishing.







Columns have been specified... now comes the moment to run it in to the page

◁ was to get reporters used to the equipment before they went "live".

The company began outputting direct to laser printer at the beginning of February. Stories were prepared on screen and checked by journalists before being pasted up.

The Advertiser is in the midst of the next stage, which is to allow completed articles to be printed out ready for paste up in the form they will appear in the paper.

Series managing editor Alex Cummings said: "We are fully satisfied with the progress to date. We are particularly delighted at the ease with which the journalists have taken to it.

"As far as we're concerned, big systems are now dinosaurs.

"We foresee an explosion of personal computer systems in newspapers – particularly for small publishers who cannot afford big systems costing three times the price.

"As the hardware can be supplied off the shelf and the software tailored to individual needs, there is no chance of being held to ransom by manufacturers with their service deals.

"Not only is our new system vastly cheaper, it also offers a lot more. You can even call a calculator up on the screen", said Alex Cummings.

At the signing of the Advertiser-Talbot deal are from left, David Hancock, Apple UK managing director; Tony Tomlinson, director of Southern Newspapers; and Andrew Clunies-Ross of Talbot Computers

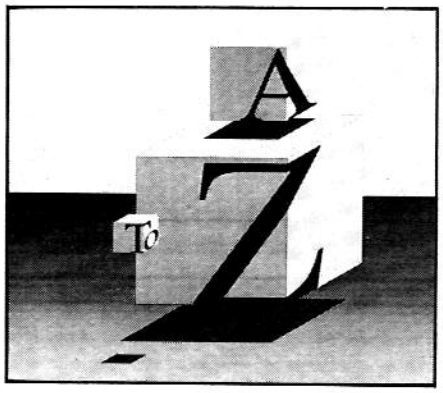
Talbot has also sold Dialtext to Eddie Shah for his Messenger series based in Warrington, Cheshire.

Another part of the package, an automatic copytaking system, is being used by three evening papers.

This also employs a Macintosh, connected to an autoanswer modem. The receiver is on line 24 hours a day and supports daily directories which automatically change at a pre-set time.

Stories sent in from journalists in district offices or in the field – using either another Macintosh or the Talbot Dialtext 4 portable – are saved on disc and printed out.

The stories are stored by name and number and can be directly accessed by sub editors.



Visual appeal

HOW to improve the visual appeal of your electronic publishing output is the theme of this year's Monotype Corporation Typographical Conference.

The residential event takes place at Queens' College, Cambridge, September 7 to 9. Its aim is to teach users of desktop publishing equipment how to add sparkle and professional authority to their documents.

Speakers will deal with management, training, design planning, special techniques, selection of typefaces and sizes, paper grades and offset printing methods required to achieve top quality publications.

An exhibition of electronic publishing equipment will provide practical examples of the foremost production methods currently available.

Illustrator launch into Europe

THIS month's MacWorld Expo in Rotterdam sees the European launch of Adobe Illustrator, the powerful new Macintosh graphics package for producing high quality line art and illustrations.

It is the latest in a string of major desktop publishing innovations from Adobe Systems, the US firm founded by former Xerox Corporation men Dr John Warnock and Dr Charles Geschke five years ago.

They developed PostScript, the first commercially available page description language for communication between computers and laser printers.

Adobe now employs more than 80 people at its Palo Alto, California, base and licenses PostScript to computer, printer and typesetter manufacturers. It often also designs the hardware needed to run the program.

In addition the company develops fonts – licensing them from industry leaders Mergenthaler Linotype, Letraset and ITC – and builds them into all PostScript output devices.

Adobe has released hundreds of fonts – designed to be stored externally to the printer and downloaded – as part of a continuing long-term effort to develop a professional graphic arts quality library. The latest crop, launched in the New Year, brings the number of typefaces now available for downloading from the Macintosh into any PostScript-equipped printer or typesetter to 111.

The full range of Adobe Systems fonts is distributed in the UK by McQueen of Edinburgh.

Their new releases include Century Old Style in two weights with italic, ITC Franklin Gothic in three weights with italic, ITC Cheltenham in two weights with italic, Park Avenue, Bodoni in three weights with italic, and Orator in one weight with italic.

Adobe Systems typefaces come as downloadable font family packages on 3.5 in discs, each containing multiple weights with italic versions designed to be used together.

Adobe also provides screen fonts created to correspond with the printer versions and enable WYSIWYG emulation during document production.

"Since we began marketing typefaces our customers have become more and more aware of the importance that type plays in document effectiveness", said Adobe Systems president John Warnick. "That's why we are committed to offering a large library of quality typefaces".

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In the game you command either NATO or Warsaw Pact forces. To help you there is a full colour poster map, together with a detailed instruction booklet.

While the producers of Theatre Europe have taken every care in researching this program to ensure the accuracy of details, we must stress that the events depicted in this conflict simulation are entirely fictitious. They must never be allowed to happen – the danger is that they might!

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TWO NEW MACHINTOSHES ANNOUNCED

Two new Macintosh systems were introduced on Monday March 2 – the Macintosh SE, available now, and the high-end Macintosh II which will not get underway until July.

The Macintosh SE offers 15 to 20 per cent increased performance over the Macintosh Plus, and it's compact design features two floppy disk drives or one floppy and one 20Mb internal hard disk. Produced in the new Apple platinum colour, it will offer a range of system expansion options via it's one slot. The Macintosh II has a modular design and open NuBus architecture of six slots configurable by the user.

Along with the two new macintoshes, Apple is bringing out an extensive range of peripherals to complement the new machines. Hard disk devices include 20 SCSI, 40 SCSI and 80 SCSI Mb internal drives as well as 40 and 80 Mb external drives. A 40 Mb tape streamer is now also offered as a back up system. Two high-res monitors will be available to Macintosh II users; a 12" Mono and a 13" colour display. When matched with the new Apple 5.25 floppy disk drive and appropriate controller, the new systems have the ability to read PC-DOS and MS-DOS files.

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Apple IIGS 1Mb

Most of the spectacular programs designed only to run on the GS require at least 512K of Memory. GraphicWriter and PaintWorks are two such programs. As more and more powerful applications are produced for the GS then the need for a large RAM Card grows. The GS uses 800K disks, and it is often desirable to be able to dump the entire contents of a disk on to a RAM Card. The answer to all these problems is to fit a 1MB Ram Card in your GS.

We are offering GS owners a genuine Apple GS RAM Card with a full 1MB on board for just £175.00
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AT 1

Apple Computer

Printer Control Unit in action

Part 6 of Stuart Bell's tutorial series covering the unitary approach to program development

IN the past two months we have developed a program to create and edit files which store information about the printer being used by our Printer Control Unit. Now we arrive at the unit itself (Listing I).

To demonstrate the use of regular (as opposed to intrinsic) units, printops is written in such a form. The obvious difference is that the declaration unit printops is NOT followed by the word intrinsic and segment numbers for code and data.

This is because we shall not link the unit into the Library, but keep it in a separate code file and link it into the host program after compilation.

To use a regular unit, compile the host program with the compiled unit (in this case prunit.code) accessible to the compiler and declared with the special (*$U*) option. This allows the compiler to check that the interface of the unit matches the call made to the unit in the host program.

When the host program has been compiled, the code for the unit's implementation must be linked in, using the Linker. The host file is the program, and the lib file is the compiled unit.

Simpler debugging

As we have noted, using regular rather than intrinsic units means that the code for the unit exsts in every program which uses it. While this is wasteful of disc space, it does make debugging simpler.

Once you have checked that the unit is working correctly you may prefer to use the Librarian to build it into the System Library (or other libraries on 128k systems) as an intrinsic unit. At the end of this article we shall look at a very simple demonstration program which uses the unit.

To return to the unit itself, note first the two main sections – interface and implementation – each with a declaration of the procedures accessible to host programs.

The first set includes parameter lists; in the implementation the parameters are shown as comments just to make them more comprehensible. If you wish, omit them to save typing.

Most of the procedures simply provide access to the values stored in p_misc without the user having to know the names of the records and sub-records involved.

Two sets of procedures require a little explanation. Firstly, select and newpage. The former selects a new typeface. On a dot matrix printer all it needs to do is to send the appropriate command sequence to the printer.

However on daisywheel machines the print wheel must be changed by the user. Select prompts you to do this via the bottom line of the display. If this display corrupts your screen layout you may prefer to prompt in another way.

After changing the wheel you type a space and the appropriate command sequence is sent – for example to tell the printer about the pitch of the new wheel's typeface.

Similarly, newpage prompts you to either insert a new sheet of paper or advance the continuous stationery if the printer requires it.

The second set of more complex procedures handle the movement of paper and of the printhead. Advance moves forward the paper (num/demon) of an inch, or as close as possible to that distance.

If the printer can only advance whole lines, it does so, assuming that it is printing at six lines per inch. Backwards does the same thing in reverse, but if the printer cannot reverse-feed the paper, it does nothing.

Finally, space attempts to move the printhead (num/denom) of an inch. It assumes that the printer CAN microspace – the user must check this before invoking the procedure. If it cannot, no action takes place.

Elegant formatting

Space permits just one very small demonstration program (Listing II). This should at least check some of the facilities.

More complex techniques, such as using proportional spacing and microspacing to achieve very elegant text formatting are left as a challenge to the interested reader.

That completes the *Apple User* Printer Control Unit. Once you have taken the effort to type in the unit, I am sure it will save much programming time, if only on simple things like turning underlining on and off.

Its real value will be appreciated when you upgrade your printer, or borrow a friend's when yours needs repair.

No need for any software changes – simply run PRSETUP to create a new PRINT.MISCINFO file. And when your laser printer finally arrives . . . no problem!

●*Next month our third and largest building block; the File Control Unit, which will let us perform all – yes ALL – the activities of the Filer from within Pascal programs.*

Listing I

```
(*$S+ *)     (* swapping needed to compile a unit -
                        not required with 128K Pascal systems *)
unit printops;

(******     I N T E R F A C E      ******)

interface

type
(* copy listing used in previous two articles *)

var    p_misc : printmisc_rec;
     prmiscf : file of printmisc_rec;  (* can't have private files      *)


procedure pr_init;                     (* initialises printer           *)

function pr_width(pitch:real):tenths;  (* gives width of printer in terms of
                                           characters at specified pitch  *)

procedure select(tf:nibble);           (* selects typeface 'tf' (0..15)  *)

procedure nameof(tf:nibble;var title:name); (* returns name of typeface 'tf' *)

function isprop(tf:nibble):boolean;    (* returns if typeface 'tf' is ps.  *)

function pitchof(tf:nibble):real;      (* returns pitch of typeface 'tf'   *)

procedure pound;                       (* prints a 'pound' sign            *)

function super:boolean;                (* if can, selects superscript:
                                          returns whether or not able      *)

function sub:boolean;                  (* if can, selects subscript:
                                          returns whether or not able      *)

procedure nosubsup;                    (* turns super/subscripting off     *)

procedure uline(on:boolean);           (* turns underlining on/off         *)

procedure newpage;                     (* if can_ff sends ff, else prompts
                                                audibly for page advance   *)

procedure advance(num,denom:integer);  (* advances paper num/denom of inch:
                                          if cannot fwd_feed, uses writelns
                                           to approximate distance required *)

procedure backwards(num,denom:integer); (* reverse feeds paper num/denom of
```

```
                                    inch; user must check if can
                                                          rev_feed *)
procedure space(num,denom:integer);     (* advances print head num/denom of
                                           inch; user must check can_ms *)


{******     I M P L E M E N T A T I O N     ******}

implementation

const cleos = 11; (* change if necessary, or better still, use Screenops *)
var      ch : char;

procedure sendseq(seq:comm_seq);
var i:byte;
begin
  i:=0;
  while (i<4) do
  begin
    unitwrite(6,seq[i],1);
    i:=i+1
  end
end;

procedure pr_init;
begin
  sendseq(p_misc.p_info.p_init)
end;

function pr_width(*pitch:real):tenths*);
begin
  pr_width:=trunc( p_misc.p_info.p_width * 10 / pitch );
end;

procedure select(*tf:nibble*);
begin
  if tf<p_misc.p_info.tfaces then
  begin
    if p_misc.p_info.stoptochange then
    begin  (* prompt user to change daisy wheel *)
      gotoxy(0,23);
      write('Please change daisy wheel: ',
                          p_misc.p_typefaces[tf].title,' <sp> ');
      repeat read(keyboard,ch) until ch=' ';
      gotoxy(0,23);
      write(chr(cleos))
    end;
    sendseq(p_misc.p_typefaces[tf].sel_tface);
  end;
end;

procedure nameof(*tf:nibble;var title:name*);
begin
  if tf<p_misc.p_info.tfaces then
    title:=p_misc.p_typefaces[tf].title
  else title:='not in use'
end;

function isprop(*tf:nibble):boolean*);
begin
  if tf<p_misc.p_info.tfaces then
    isprop:=p_misc.p_typefaces[tf].is_ps
  else isprop:=false
end;

function pitchof(*tf:nibble):real*);
begin
  if tf<p_misc.p_info.tfaces then
    pitchof:=p_misc.p_typefaces[tf].pitch
  else pitchof:=10;  (* 0 might cause divide problems! *)
end;

procedure pound;
var pnd:array[0..0] of byte;
begin
  pnd[0]:=ord('#');
  if p_misc.p_info.has_pound then
  begin
    send_seq(p_misc.p_info.pound_char[0]);
    send_seq(p_misc.p_info.pound_char[1])
  end
  else unitwrite(6,pnd,1) (* send a '#' as second-best *)
end;

function super(*:boolean*);
begin
  if p_misc.p_info.can_sup_script then
    send_seq(p_misc.p_info.sup_script);
  super:=p_misc.p_info.can_sup_script
end;

function sub(*:boolean*);
begin
  if p_misc.p_info.can_sub_script then
    send_seq(p_misc.p_info.sub_script);
  sub:=p_misc.p_info.can_sub_script
end;

procedure nosubsup;
begin
  send_seq(p_misc.p_info.non_sub_sup)
end;

procedure uline(*on:boolean*);
begin
  if p_misc.p_info.can_uline then
    if on then sendseq(p_misc.p_info.uline_on)
          else sendseq(p_misc.p_info.uline_off)
end;

procedure newpage;
var  ff:array[0..0] of byte;
begin
  ff[0]:=12;
  if p_misc.p_info.can_ff then
    unitwrite(6,ff,1)
  else
    begin
      gotoxy(0,23);
      write('Please advance/insert for new page <sp> ');
      repeat read(keyboard,ch) until ch=' ';
      gotoxy(0,23);
      write(chr(cleos))
    end
end;

procedure advance(*num,denom:integer*);
var  advs,i:integer;
          r:real;
        wl:array[0..0] of byte;
begin
  if p_misc.p_info.can_fwd_feed then
  begin
    r:= (num / denom) * p_misc.p_info.fwd_feed_frac;
    advs:=trunc(r+0.5);       (* round value *)
    for i:= 1 to advs do
      send_seq(p_misc.p_info.fwd_feed)
    end
  else
  begin   (* can't fwd feed: use writelns *)
    wl[0]:=13;                (* carriage return *)
    r:= (num / denom ) * 6;   (* assume 6 l.p.i. *)
    advs:=trunc(r+0.5);       (* round value     *)
    for i:= 1 to advs do
      unitwrite(6,wl,1)
  end
end;

procedure backwards(*num,denom:integer*);
var  advs,i:integer;
          r:real;
begin
  if p_misc.p_info.can_rev_feed then
  begin
    r:= (num / denom) * p_misc.p_info.rev_feed_frac;
    advs:=trunc(r+0.5);       (* round value *)
    for i:= 1 to advs do
      send_seq(p_misc.p_info.rev_feed)
  end
end;

procedure space(*num,denom:integer*);
var  advs,i:integer;
          r:real;
begin
  if p_misc.p_info.can_ms then
  begin
    r:= (num / denom) * p_misc.p_info.ms_per_inch;
    advs:=trunc(r+0.5);       (* round value *)
    for i:= 1 to advs do
      send_seq(p_misc.p_info.ms)
  end
end;

procedure initialise;
begin
  reset(prmiscf,'*PRINT.MISCINFO');
  p_misc:=prmiscf^
end;

begin (* main program - called when user program started *)
  initialise
end.
```

Listing II

```
program prunitdemo;

(* using printops as a regular unit - Link before use! *)
(*$U #11:prunit.code *)
uses printops;

var  p:file of char;

begin
  pr_init;
  rewrite(p,'printer:');
  newpage;
  write(p,'This is a pound: ');
  pound;
  writeln(p);
  uline(true);
  writeln(p,'This should be underlined!');
  uline(false);
  select(1);
  writeln(p,'This is in typeface number 1');
    (* next line shows direct access to p_misc data structure *)
  writeln(p,'The pitch is ',p_misc.p_typefaces[1].pitch:5:2);
  writeln(p,'end of demo');
  close(p)
end.
```

Appletip

Neater menus

Very often a list or menu is presented indented on the screen. Most people use HTAB or TAB functions to achieve this, but it is much simpler to change the left hand side of the window before the table by the required amount.

For example POKE 32,5 . . . TABLE . . . POKE 32,0 has the same effect as a series of HTAB5's before each part of the table. Make sure that each entry will fit neatly on one line. If you're not sure, first set the window to the appropriate value, e.g. POKE 33,34. (See the Applesoft manual page 129.)

If you are using Pascal 1.3 whenever the system comes up with an error and asks you to press space try pressing Escape. It goes back to where it came from and tries again.

I have found no reference in the manual to this. I don't know if it works on 1.2 or 1.1 as I haven't got either version.

B.C. Keal

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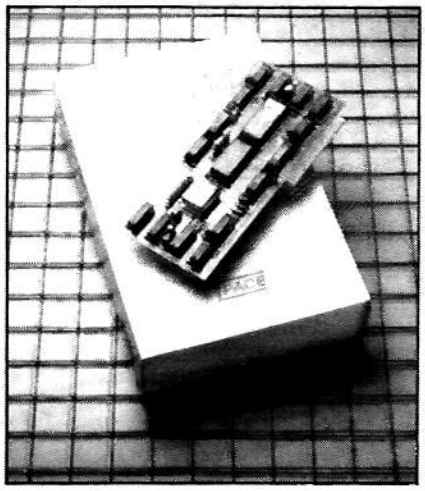

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● Readers taking advantage of either of these offers will also be entitled to free registration to MicroLink, Britain's fastest-growing electronic mail service. With it you can use your Apple to send (and receive) telex, telemessages, down load free Apple telesoftware, and communicate directly with other Apple users all over the USA and other parts of the world.

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Getting facts from figures

P.A. Marshall finds a host of applications for image analysis techniques

IMAGE analysis is the processing of visual information such as an optical image, a photograph, or a video signal in a way which makes it possible to make measurements from it.

Among the sciences in which image analysis has proved useful are geology, physics, crystallography, metallurgy and medicine. The most common applications are the measurement of the size of individual features, that is length, diameter, perimeter and so on, and the measurement of the percentage area within a given observation field which is occupied by a given object or group of objects.

As part of our research at Hull University is to the physiology of diseased skeletal muscle it became necessary to make measurements of both kinds.

The diameters and relative proportions of the various types of fibre which are found in the muscle, and the degree of muscles by collagenous connective tissue (similar in nature to the material from which tendons are made), are important parameters which we wished to measure in both diseased and normal muscles.

In order to make these measurements a low cost image analyser base around the Apple II was built. The hardware used is illustrated in Figure I and Plate I.

The optical image to be analysed was provided by an Hitachi high resolution video camera which was attached directly to a microscope. In principle, however, it is also possible to use the camera with a normal lens to provide images of larger objects.

The composite video image was fed into a digitising interface (Computech Diplomat) installed in one of the Apple's peripheral slots. This converts the continuously-varying analogue video signal into a digital form and breaks the image down into a series of values equivalent to the pixels of the computer video graphics screen.

Before each pixel is plotted its value is compared with a user-selected threshold. If the value is greater than the threshold the pixel is plotted as black, and if lower as white.

In actuality two thresholds were used to select upper and lower limits for the digitised image. These were set by 150 Kohm potentiometers attached to the Apple's games port.

Resolution

The raw video, displayed on a high resolution black and white monitor, enabled comparison between the two images. Although some loss of resolution was inevitable, by careful adjustment of the threshold and the intensity of the micro-

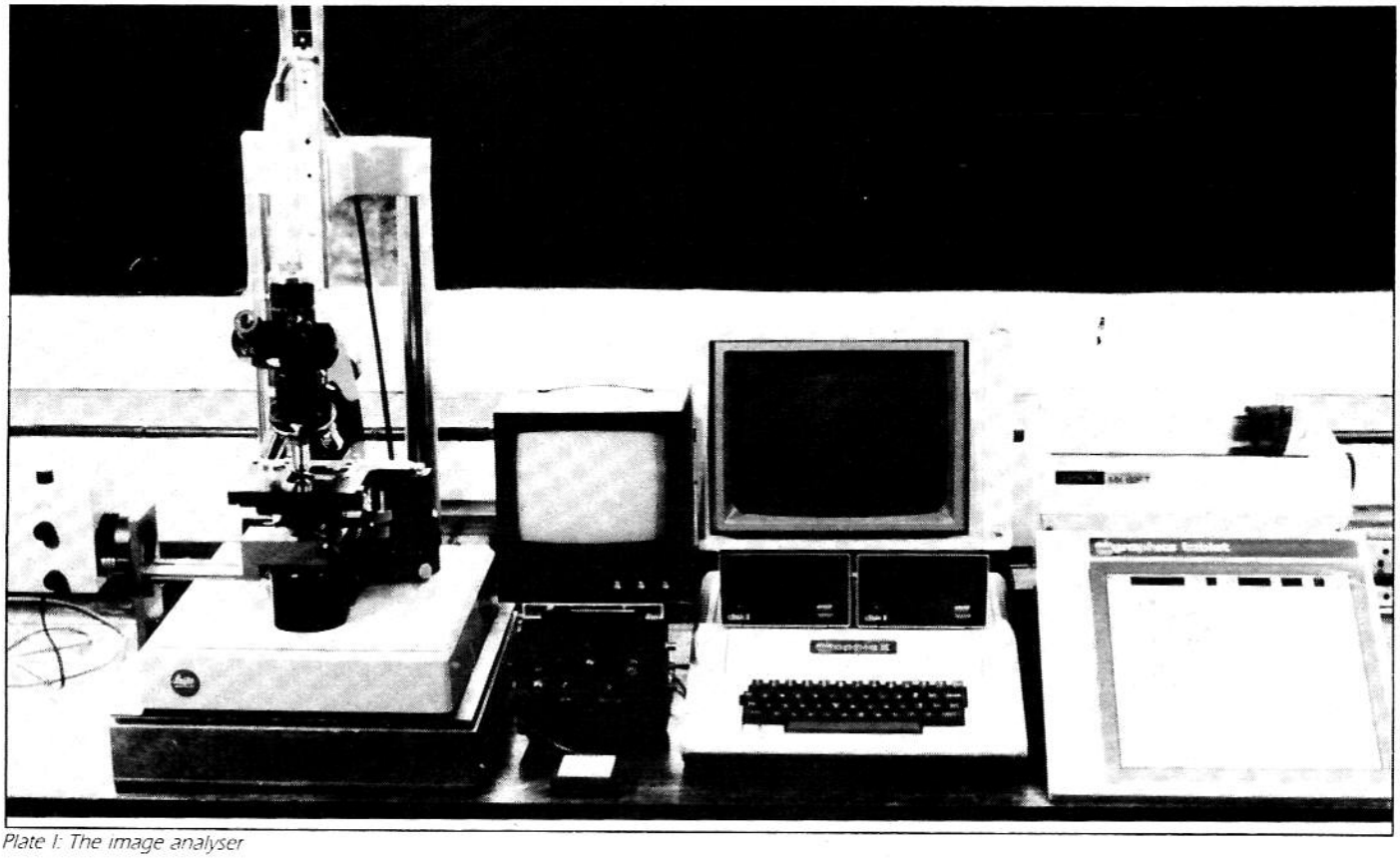


Plate I: The image analyser

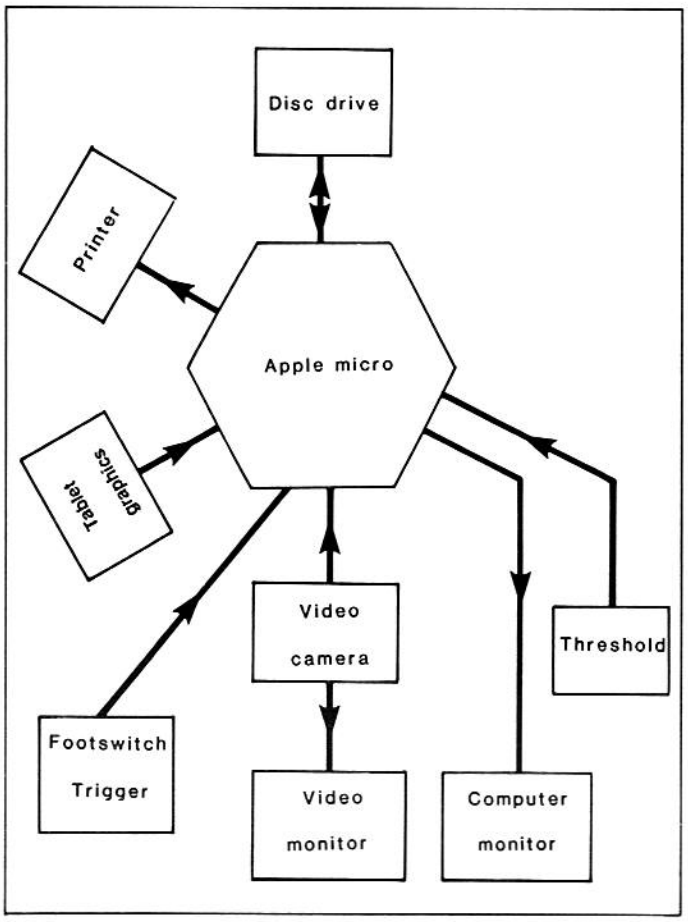


Figure I: The hardware setup

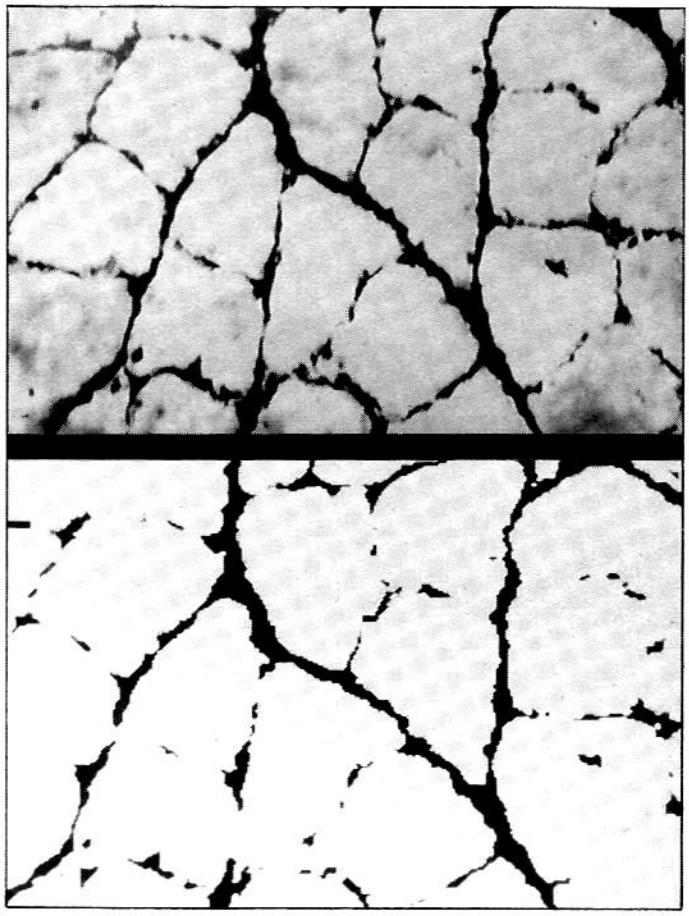


Plate II: Comparison of video and digital images

scope illumination, good agreement between the digitised image and the video image was obtained (Plate II).

When this was applied to sections stained with a red dye to highlight the connective tissue in the muscle, a green filter was introduced into the light path to increase contrast.

By counting the number of black pixels in the computer image a measure of the degree of connective tissue infiltration in a given muscle could be made. This was done by a machine code utility called up by the controlling software.

Graphics tablet

An external footswitch was added to allow the capture of a digitised frame independently of software control.

Measurement of the diameter of the individual muscle fibres was made possible by the addition of a graphics tablet. Since the video camera was capable of accepting an external synchronisation pulse it was possible to synchronise the camera to the computer.

Having done this, it was a simple matter to overlay the raw video signal with a computer graphic image, thus making it possible to make measurements of any features by drawing on the graphics table with the stylus.

Routines were written which made it possible to measure areas, perimeters or the diameter of the muscle fibres.

The software owes much to the original Tablet-code Applesoft written by B. Ehlers for Apple as a demonstration of the capabilities of the graphics tablet.

Alterations

As many of the routines used in this program were obviously of immediate use to us, there seemed little point in re-inventing the wheel. It has become necessary however, to make major alterations in the original program to get it to perform all of the functions we required.

Once run, the software transferred control of the system to the graphics tablet. The various functions performed by the hardware were selectable from the menu panel of the graphics tablet.

Alternatives include resetting the video or tablet hardware, calibrating the tablet surface for length measurements, drawing straight lines between two specified points (used to measure diameters), cataloging data files, blanking off a border to cut off any unwanted detail, measuring areas and perimeters, as well as counting the number of black pixels to estimate the amount of connective tissue.

These latter functions could be applied to either a single microscope field or a series of fields and the data stored on floppy disc for later analysis. □

P.A. Marshall is Senior Research Technician, Department of Zoology, University of Hull

Appletalk

THINK big, Apple is telling single-minded personal computer users. The company believes its newly-released AppleShare workgroup fileserver will extend the single user's thinking towards networking.

The product is a software package that will allow up to 25 users to access documents, folders, applictions or whole discs of information from anywhere on an AppleTalk network as if it were resident on each user's Mac.

It needs a dedicated Macintosh Plus, SE or II and at least one hard disc, along with appropriate AppleTalk personal network cables and connections for each workstation which must have 512k of memory.

"Apple UK communications manager, Chris Jones said: "We recognised the need for our own fileserver as part of our long term communications plans for Macintosh users".

He said nearly all existing Macintosh application software would run, unmodified, on AppleShare.

Bigger, brighter and better

Den James offers a revised program that makes more of Print Shop's graphics

THE September 1986 issue of *Apple User* featured an article titled Expanding the capabilities of Print Shop, written by Henry Kong. Both the article and the program are of immense value in the handling of Print Shop's graphics, but as the programs did not function quite as expected I took the opportunity to revise them slightly.

I left file DO unchanged and extended X4 and X9 to handle image enlargement more effectively. Print Shop's graphics are designed in such a way that all eight bits of each byte are used and sent to the printer, but when you try to send them to the hi-res screen only seven of the bits are shown: The eighth one is used to select the colours of the dots in that byte.

This meant that some image pixels were lost, and with this in mind I wrote a program which translates the 11 eight-bit bytes in each Print Shop graphic line into 13 seven-bit bytes that the hi-res screen will accept without image degredation.

Factorised code

Each of these new lines is 91 pixels long, but the extra three bits don't show up on the screen as they match the background area.

This translator, located at $7000-$70EF, is simple and repetitive (Figure I shows a graphic representation) and the subroutines at $70D3 and $70E1 are simply "factorisations" of the overall code – they are not truly self-contained modules.

Changes to X4 and X9 perform the similar repetitive task of shifting bits around byte boundaries (see Figure II) and the subroutines at $71FC, $7208, $7212 and $721F are also factorisations.

The Basic program has been revised too, the format following Henry Kong's original, but slightly adapted toward my personal preferences. (Deleting all the REMs will reduce on-disc length by five sectors to 15 and are included here for clarification.)

Options are now presented on-screen and their scope is extended to include what I think Henry Kong originally intended (judging by the superfluous lines in his listing on Page 31 of his article). These are <P>rint, <S>ave to disc, magnify 1x, 4x and 9x, <M>irror image, toggle the <B>ackground colour (to match or contrast with the image) and <I>nvert the image.

Examples of the resultant images are shown in Figure III – (a) as printed from Print Shop's own graphic editor, (b) at normal size from this program, followed by (c) at 4x and (d) at 9x.

They are a little extended in appearance, but still lend themselves well to further manipulation with Paul Sinnet's excellent Hi-Res Screen Editor, also featured in recent issues of *Apple User*.

A further refinement can be made by replacing the 4x magnification code with 6x in order to produce a better proportioned enlargement. If this is preferred you need binary file X6X9TR instead of X4X9TR – only the X6 section is changed (see listing) – and alter the Basic as follows:

- Change memory location 29248 to 29242 in line 90.
- Change the 52 to 54 in line 430.
- Change the value of TM from 96 to 116 in line 730.

Reductions

- Change the value of HT from 104 to 156 in line 770.
- Change all references to X4 and T=4 to X6 and T=6 in lines 90, 190, 430, 530, 580, 640, 670, 730, 770, 880 and 1140.
- Change the value of LOC from 29450 to 24576 in line 70.

Finally, a word on Henry Kong's graphic reducer. If this is incorporated in Paul Sinnet's editor you can easily move the area you want to reduce so that it occupies the top left corner of the screen. (The reducer will only accept data from a window 176 pixels wide by 156 deep, ranged top left.)

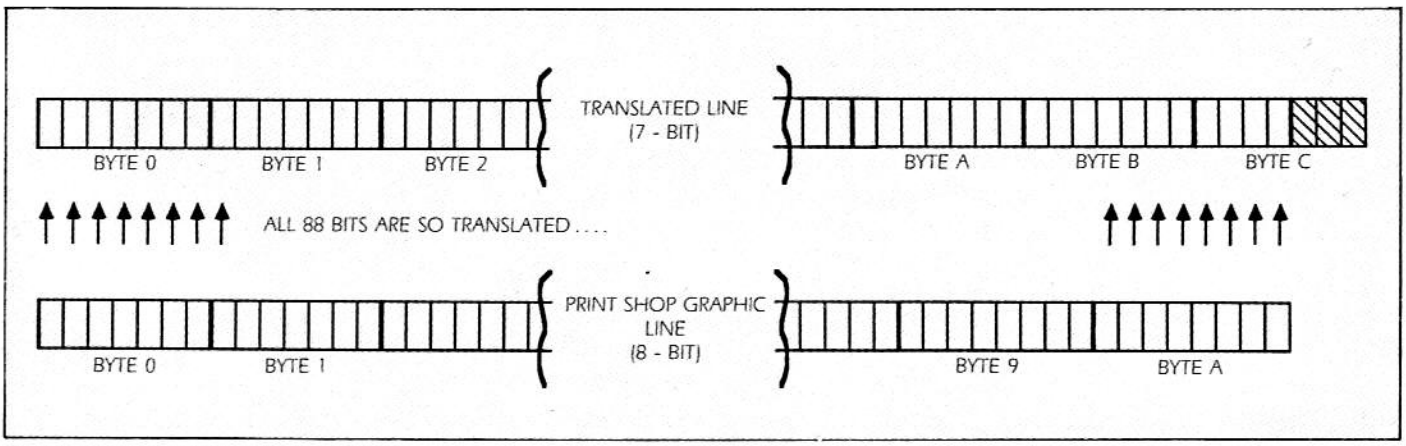


Figure I: Graphic representation of translator

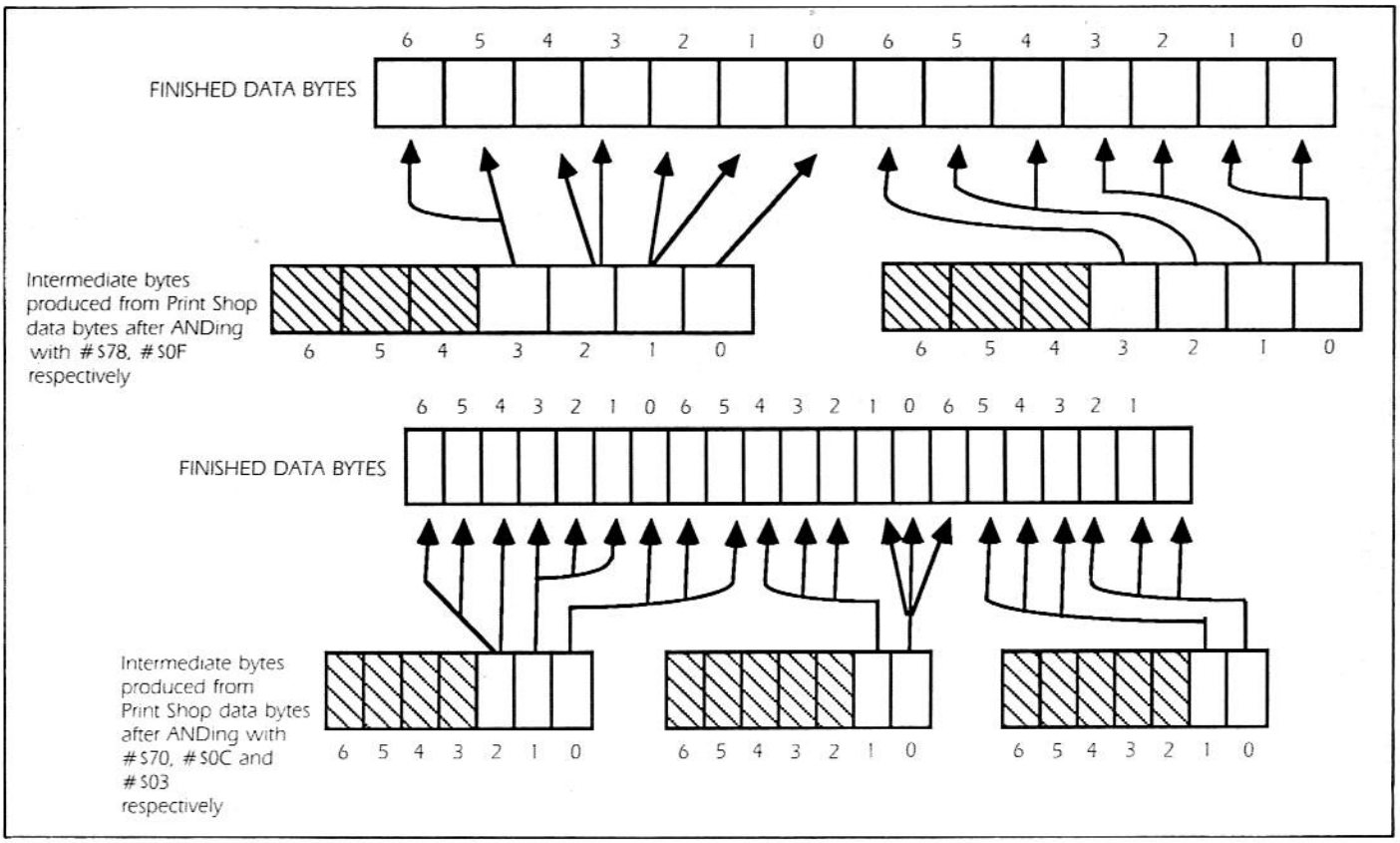
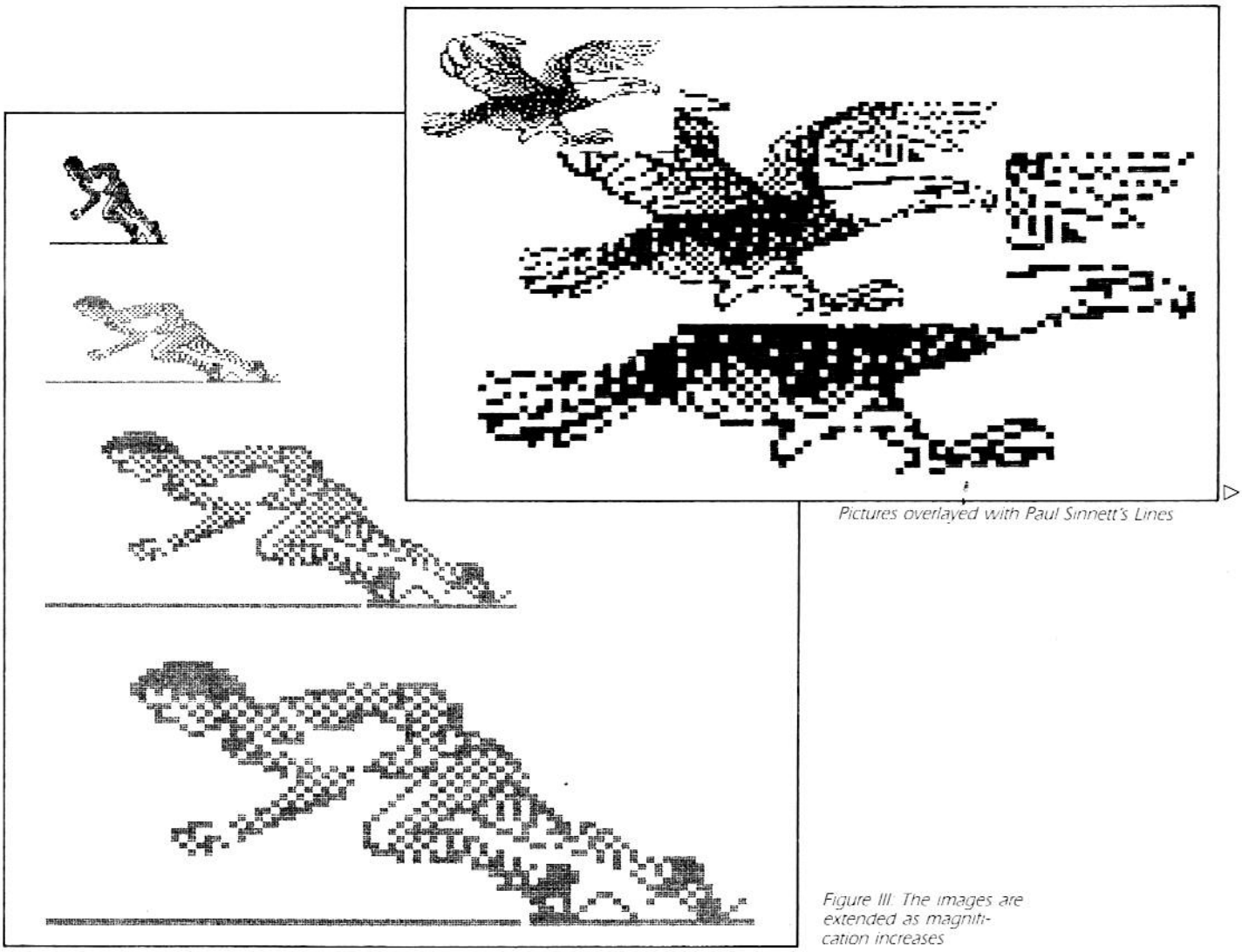


Figure II: Graphic representation of X4 and X9 The Basic program



Pictures overlayed with Paul Sinnett's Lines

Figure III: The images are extended as magnification increases

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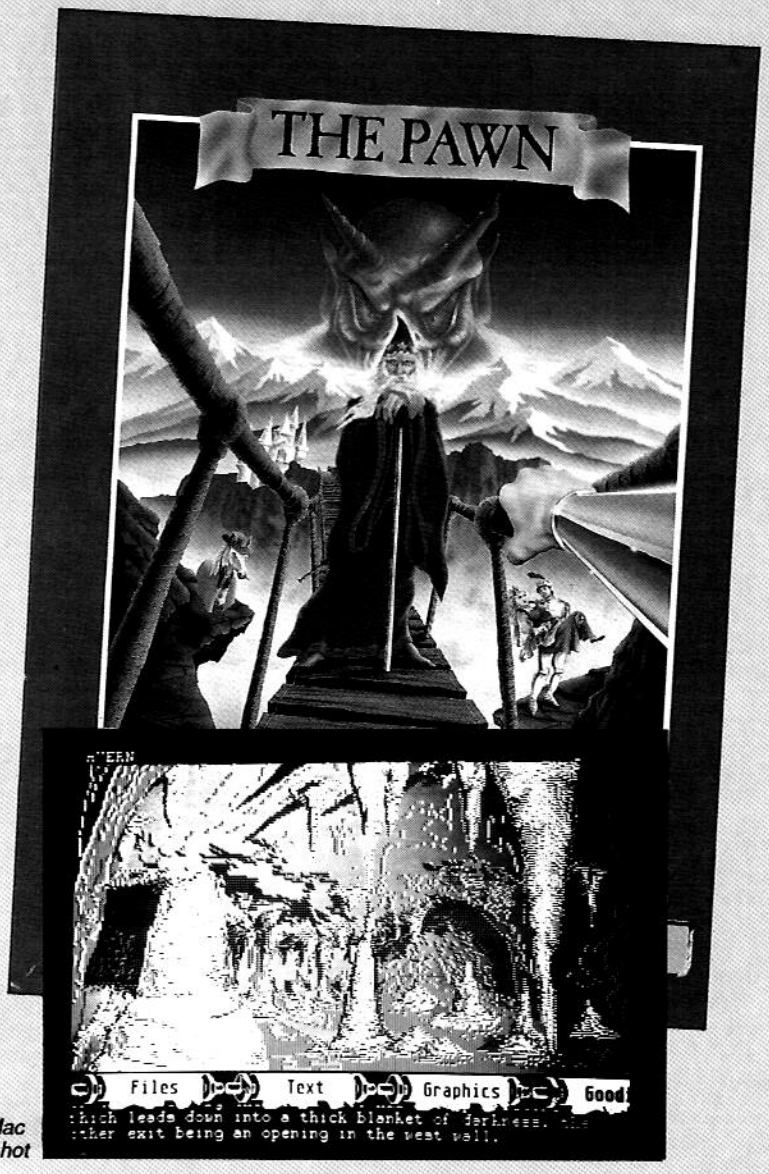

Apple Mac screenshot

"Overall the atmosphere is beautifully evocative and the gameplay excellent"

– Paul Gardener, Apple User, February 1987

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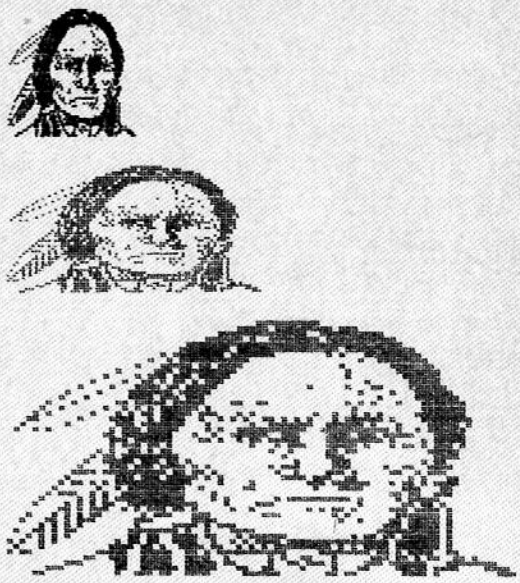
The Basic program

```
10  REM  MODIFICATION BY DEN
    JAMES
20  REM  3rd November 1986
30  ONERR  GOTO 970
40  REM
50  REM  INITIALISE
    VARIABLES
60  REM
    ====================
70 LOC = 29450: FOR I = LOC
    TO LOC + 4: READ A: POKE
    I,A: NEXT
80 D$ =  CHR$ (13) +  CHR$
    (4)
90 ML = 768:X4 = 29248:X9 =
    28928:TR = 28672:B6 =
    62454
100 DR = ML:RE = ML + 58
110 XR = ML + 25
120  REM
130  REM  PRINT INFORMATION
    AND INSTRUCTIONS; BLOAD
    BIN FILES
140  REM
    ============================
    ============================
150  TEXT : HOME : HTAB 6:
    VTAB 3: INVERSE : PRINT
    SPC( 28): HTAB 6: VTAB 4:
    PRINT " PRINT SHOP
    GRAPHIC HANDLER ": HTAB
    6: VTAB 5: PRINT  SPC(
    28): NORMAL
160  PRINT : PRINT : PRINT
    "This program reads,
    enlarges, prints andsaves
    to disk any 4-sector
    Print Shop-  compatible
    graphic."
170  PRINT : PRINT "Files
    saved are in 33-sector
    format."
180  PRINT : PRINT "For
    further details see Apple
    User,     issue dated
    September 1986, page 28.
    The original version of
    this program waswritten
    by Henry Kong and Y. K.
    Tien."
190  PRINT D$;"BLOAD DO":
    PRINT D$;"BLOADX4X9TR":
    FOR N = 1 TO 1000: NEXT
200  VTAB 19: PRINT "Place
    the graphic source disk
    in drive 1and the graphic
    object disk in drive 2."
210  VTAB 22: PRINT "Press
    any key to continue": GET
    A$
220  REM
230  REM  DISK ACCESS AND
    TRANSLATION OF PRINT SHOP
    GRAPHIC DATA INTO A FORM
    ACCEPTABLE TO HGR
240  REM
    ============================
    ============================
    ===========
250  ONERR  GOTO 970
260  HOME : VTAB 10: INPUT
    "Enter graphic name
    (Return catalogs)  ";H9$
270  IF H9$ = "" THEN  VTAB
    12: PRINT "Drive 1 or
    2?": GET A$:H5 =  VAL
    (A$)
280  IF H9$ = "" THEN  IF A$
    <  > "1" AND A$ <  > "2"
    THEN 270
290  IF H9$ = "" THEN  TEXT
    : PRINT : PRINT : PRINT :
    PRINT D$;"CATALOGD";H5:
    PRINT : PRINT "Press any
    key to continue": GET A$:
    GOTO 250
300  HGR : VTAB 23: INVERSE
    : PRINT H9$: NORMAL :
    PRINT
    D$;"BLOAD";H9$;",D1,A$5000
    "
310  CALL TR
320 T = 1: GOSUB 640
```

This is one of hundreds of programs now available FREE for downloading on MicroLink

```
330  REM
340  REM  MAIN PROGRAM LOOP,
    WAITS FOR USER'S
    SELECTION
350  REM
    ============================
    ====================
360  GOSUB 670
370 S =  PEEK (49152): IF S
    < 128 THEN 370
380  POKE 49168,0
390 S = S - 128
400  IF S = 80 THEN  GOSUB
    790: GOTO 360: REM
    <P>rint
410  IF S = 83 THEN  GOSUB
    820: GOTO 360: REM
    <S>ave
420  IF S = 49 THEN  GOSUB
    870: GOTO 360: REM  1x
    magnification
430  IF S = 52 THEN  GOSUB
    880: GOTO 360: REM  4x
    magnification
440  IF S = 57 THEN  GOSUB
    890: GOTO 360: REM  9x
    magnification
450  IF S = 77 THEN  GOSUB
    900: GOTO 360: REM
    <M>irror
460  IF S = 66 THEN  GOSUB
    910: GOTO 360: REM
    <B>ackground toggle
470  IF S = 73 THEN  GOSUB
    950: GOTO 360: REM
    <I>nverse toggle
480  IF S = 78 THEN  TEXT :
    HOME : GOTO 250: REM
    <N>ew graphic
490  GOTO 370
500  REM
510  REM  SUBROUTINES
520  REM  ===========
530  REM  S/R 640 EXPANDS
    NEWLY-LOADED GRAPHIC 4x
    and 9x AND STORES DATA
540  REM  670 PRINTS OPTIONS
    ON BOTTOM 4 LINES OF HGR
550  REM  710 SETS UP
    PARAMETERS FOR DISPLAYING
    THE VARIOUS SIZES OF
    IMAGE
560  REM  790 DUMPS HGR OUT
    TO THE PRINTER
570  REM  820 SAVES HGR TO
    DISK ALLOWING CHOICE OF
    FILE NAME
580  REM   870 DISPLAYS THE
    IMAGE AT 1x, 880 AT 4x
    AND 890 AT 9x
590  REM   900 FLIPS THE
    IMAGE HORIZONTALLY
600  REM    910 TOGGLES THE
    BACKGROUND COLOUR BLACK
    OR WHITE USING THE HCOLOR
    MASKS FROM THE LOOKUP
    TABLE AT $F6F6
610  REM  950 INVERTS THE
    IMAGE BY EORing WITH A
    MASK OF #$7F
620  REM  970 IS THE
    ERROR-TRAPPING ROUTINE
    AND ISSUES STANDARD DOS
    MESSAGES
630  REM   1060 IS A
    REFERENCE TABLE OF
    VARIABLES
640  CALL X4: CALL X9
650  GOSUB 710
660  HGR : CALL RE: CALL DR:
    RETURN
670  HOME : VTAB 21: PRINT
    "1=normal  4=magnify 4x
    9=magnify 9x"
680  PRINT "<I>nverse toggle
    <M>irror <N>ew graphic"
690  PRINT "<P>rint image
    <S>ave to disk (Drive 2)"
700  PRINT "<B>ackground
    colour toggle";: RETURN
710  IF T = 1 THEN TM = 108
720  IF T = 9 THEN TM = 64
730  IF T = 4 THEN TM = 96
740  POKE ML + 1,TM: POKE ML
    + 59,TM: POKE ML + 136,TM
750  IF T = 1 THEN HT =
    52:LN = 12
760  IF T = 9 THEN HT =
    156:LN = 38
```



```
770  IF T = 4 THEN HT =
   104:LN = 25
780 VB = VT + HT:HR = HL +
   LN: POKE 252,VT: POKE
   253,VB: POKE 254,HR: POKE
   255,HL: RETURN
790  PRINT D$;"PR#1": PRINT
   : PRINT  CHR$ (9);"G"
800  PRINT D$;"PR#0"
810  RETURN
820  HOME : VTAB 21: PRINT
   "SAVE GRAPHIC AS
   PI.";H9$;"X";T;" ?";
830  GET A$: IF A$ = "N"
   THEN 850
840  PRINT D$;"BSAVE
   PI.";H9$;"X";T;",A$2000,L$
   1FF7,D2": GOTO 860
850  VTAB 21: INPUT "SAVE
   GRAPHIC NAMED: ";HN$: IF
   LEN (HN$) THEN  PRINT
   D$;"BSAVE";HN$;",A$2000,L$
   1FF7,D2"
860  FOR N = 1 TO 9:X =
   PEEK ( - 16336): NEXT :
   RETURN
870 T = 1: GOSUB 710: HGR :
   CALL DR: RETURN
880 T = 4: GOSUB 710: HGR :
   CALL RE: CALL DR: RETURN
890 T = 9: GOSUB 710: HGR :
   CALL RE: CALL DR: RETURN
900  CALL RE: CALL DR:
   RETURN
910  IF  PEEK (228) = 0 THEN
   930
920  IF  PEEK (228) = 127
   THEN 940
930  HGR : HCOLOR= 3: HPLOT
   0,0: CALL BG: CALL DR:
   RETURN
940  HGR : HCOLOR= 0: HPLOT
   0,0: CALL BG: CALL DR:
   RETURN
950  IF  PEEK (XR) = 234
   THEN  POKE XR,73: POKE XR
   + 1,127: CALL DR: RETURN
960  IF  PEEK (XR) = 73 THEN
   POKE XR,234: POKE XR +
   1,234: CALL DR: RETURN
970  POKE 216,0: TEXT : HOME
   : VTAB 5
980  CALL LOC: PRINT
990  VTAB 23: PRINT "PRESS
   SPACE BAR TO CONTINUE"
1000  GET A$:A =  ASC (A$)
1010  IF A > 90 THEN A = A -
   32
1020  IF A <  > 32 THEN 990
1030  GOTO 250
1040  DATA
   166,222,76,2,167: REM
   LDX $DE;JMP $A702 - GET
   ERR No. AND PRINT ERR MSG
1050  REM
1060  REM   LIST OF
   VARIABLES
1070  REM
   ================
1080  REM   H9$ = NAME OF
   GRAPHIC TO LOAD
1090  REM  HN$ =
   USER-DEFINED NAME FOR
   IMAGE BEING BSAVED
1100  REM  H5  = VAL(DRIVE
   No)
1110  REM  TR  = START OF
   CODE WHICH TRANSLATES
   PRINT SHOP'S 8-BIT DATA
   BYTES INTO 7-BIT FORM FOR
   DISPLAYING ON HGR.
1120  REM  S   = FUNCTION
   SELECTION KEY CODE
1130  REM  ML  = ADDRESS OF
   START OF FILE 'DO'
1140  REM  X4 and X9 = START
   ADDRESSES OF FILES X4 and
   X9
1150  REM  DR  = START OF
   CODE TO DRAW GRAPHIC ON
   HGR
1160  REM  RE  = START OF
   CODE TO REVERSE THE
   GRAPHIC ON HGR
1170  REM  TM  = HIGH BYTE
   OF GRAPHIC DATA STORAGE
   AREA
1180  REM  XR  = ADDRESS OF
   CODE GOVERNING EOR OF THE
   IMAGE
1190  REM  T   =
   MAGNIFICATION FACTOR
1200  REM  HT  = HEIGHT, IN
   LINES, OF THE IMAGE
```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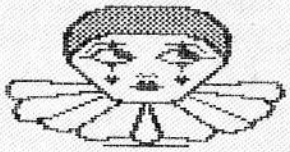
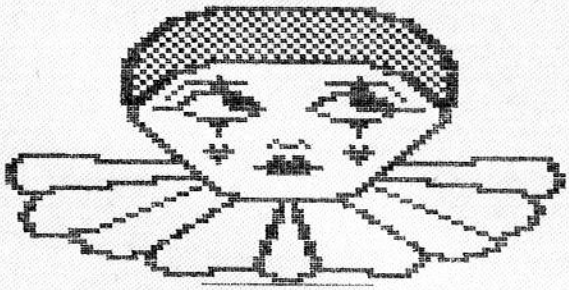
```
1210  REM  LN  = LENGTH, IN
   BYTES, OF 1 LINE OF THE
   IMAGE
1220  REM  VB  = (VERTICAL)
   BOTTOM LINE POSITION OF
   THE IMAGE
1230  REM  VT  = (VERTICAL)
   TOP LINE POSITION OF THE
   IMAGE
1240  REM  HR  = (HORIZ)
   RIGHT BYTE POSITION OF
   EACH IMAGE LINE
1250  REM  HL  = (HORIZ)
   LEFT BYTE POSITION OF
   EACH IMAGE LINE
1260  REM  BG  = ROM ROUTINE
   TO CLEAR THE HIRES SCREEN
   TO LAST HCOLOR HPLOTTED
```





X4X9TR as a hexadecimal dump

```
7000- A9 6C 85 ED A9 00 85 EC
7008- 85 FA A9 58 85 FB A9 34
7010- 85 06 A2 00 A0 00 B1 FA
7018- 85 1A 20 CC 70 4A EA EA
7020- 81 EC 20 C5 70 A5 1A 0A
7028- 0A 0A 0A 0A 20 D3 70 20
7030- E1 70 0A 0A 0A 20 D3 70
7038- 4A 20 E1 70 0A 0A 20 D3
7040- 70 4A 4A 20 E1 70 0A 20
7048- D3 70 4A 4A 4A 20 E1 70
7050- 20 D3 70 4A 4A 4A 4A 4A
7058- 18 65 1B EA EA 81 EC 20
7060- C5 70 A5 1A 20 D3 70 4A
7068- 4A 4A 4A 4A 4A 18 65 1B
7070- EA EA 81 EC 20 C5 70 A5
7078- 1A 29 7F 81 EC 20 C5 70
7080- B1 FA 85 1A 20 CC 70 4A
7088- EA EA 81 EC 20 C5 70 A5
7090- 1A 0A 0A 0A 0A 0A 20 D3
7098- 70 20 E1 70 0A 0A 0A 20
70A0- D3 70 4A 20 E1 70 0A 0A
70A8- 20 D3 70 4A 4A 20 E1 70
70B0- 0A 0A 29 7F 81 EC 20 C5
70B8- 70 C6 06 A5 06 C9 00 10
70C0- 01 60 4C 16 70 E6 EC D0
70C8- 02 E6 ED 60 E6 FA D0 02
70D0- E6 FB 60 0A 29 7F 85 1B
70D8- B1 FA 85 1A 20 CC 70 4A
70E0- 60 4A 18 65 1B EA EA 81
70E8- EC 20 C5 70 A5 1A 0A 60
70F0- 00 00 00 00 00 00 00 00
70F8- 00 00 00 00 00 00 00 00
7100- A9 03 85 1D A9 0D 85 EB
7108- A9 D0 85 1C A9 40 85 FD
7110- 85 FF 85 09 A9 27 85 FC
7118- A9 4E 85 FE A9 6C 85 07
7120- A9 00 85 06 85 08 AA A1
7128- 06 E6 06 D0 02 E6 07 C6
7130- 1C D0 05 C6 1D D0 01 60
7138- 85 19 29 70 4A 4A 4A 4A
7140- 20 A1 71 A5 19 29 0C 4A
7148- 4A 20 C7 71 A5 19 29 03
7150- 20 E3 71 C6 EB D0 D0 18
7158- A5 08 69 4E 85 08 A5 09
7160- 69 00 85 09 A5 FC 69 4E
7168- 85 FC A5 FD 69 00 85 FD
7170- A5 FE 69 4E 85 FE A5 FF
7178- 69 00 85 FF A9 0D 85 EB
7180- D0 A5 81 08 E6 08 D0 02
7188- E6 09 81 FC E6 FC D0 02
7190- E6 FD 81 FE E6 FE D0 02
7198- E6 FF A9 08 65 1A 85 1A
71A0- 60 85 1A 29 04 0A 0A 85
71A8- 1B 20 1F 72 85 1B A5 1A
71B0- 29 02 20 08 72 20 1F 72
71B8- 85 1B 20 FC 71 20 12 72
71C0- 0A 18 65 1B 85 1B 60 85
71C8- 1A 29 02 0A 20 08 72 20
71D0- 1F 72 85 1B 20 FC 71 A5
71D8- EC 0A 85 EC 18 65 1B 20
71E0- 12 72 60 85 1A 29 02 0A
71E8- 0A 20 08 72 20 1F 72 85
71F0- 1B 20 FC 71 A5 EC 20 1F
71F8- 72 4C 82 71 A5 1A 29 01
7200- 85 EC 18 65 1B 85 1B 60
7208- 85 EC 18 65 1B 85 1B A5
7210- EC 60 20 82 71 A5 EC 0A
7218- 0A 0A 0A 0A 85 1B 60 0A
7220- 85 EC 18 65 1B 85 1B A5
7228- EC 0A 18 65 1B 60 00 00
7230- 00 00 00 00 00 00 00 00
7238- 00 00 00 00 00 00 00 00
7240- A9 03 85 1D A9 0D 85 EB
7248- A9 B0 85 1C A9 60 85 FD
7250- 85 09 A9 1A 85 FC A9 6C
7258- 85 07 A9 00 85 06 85 08
7260- AA A1 06 E6 06 D0 02 E6
7268- 07 C6 1C D0 05 C6 1D D0
7270- 01 60 85 19 29 78 4A 4A
7278- 4A 20 B7 72 A5 19 29 0F
7280- 20 DB 72 C6 EB D0 DA 18
7288- A5 08 69 1A 85 08 A5 09
7290- 69 00 85 09 A5 FC 69 1A
7298- 85 FC A5 FD 69 00 85 FD
72A0- A9 0D 85 EB D0 BB 81 08
72A8- E6 08 D0 02 E6 09 81 FC
72B0- E6 FC D0 02 E6 FD 60 85
72B8- 1A 29 03 85 1B 29 02 0A
72C0- 18 65 1B 85 1B A5 1A 29
72C8- 04 20 1F 72 85 1B A5 1A
72D0- 29 08 0A 20 1F 72 09 80
72D8- 4C A6 72 85 1A 29 01 85
72E0- 1B 0A 18 65 1B 85 1B A5
72E8- 1A 29 02 20 1F 72 85 1B
72F0- A5 1A 29 04 0A 20 1F 72
72F8- 85 1B A5 1A 29 08 0A 0A
7300- 0A 18 65 1B 09 80 4C A6
7308- 72
```

Replacing the corresponding part of X4X9TR with this to obtain X6X9TR

```
723A- A9 34 85 FE A9 03
7240- 85 1D A9 0D 85 EB A9 D0
7248- 85 1C A9 74 85 FD 85 FF
7250- 85 09 A9 1A 85 FC A9 6C
7258- 85 07 A9 00 85 06 85 08
7260- AA A1 06 E6 06 D0 02 E6
7268- 07 C6 1C D0 05 C6 1D D0
7270- 01 60 85 19 29 78 4A 4A
7278- 4A 20 CB 72 A5 19 29 0F
7280- 20 EF 72 C6 EB D0 DA 18
7288- A5 08 69 34 85 08 A5 09
7290- 69 00 85 09 A5 FC 69 34
7298- 85 FC A5 FD 69 00 85 FD
72A0- A5 FE 69 34 85 FE A5 FF
72A8- 69 00 85 FF A9 0D 85 EB
72B0- D0 AF 81 08 E6 08 D0 02
72B8- E6 09 81 FC E6 FC D0 02
72C0- E6 FD 81 FE E6 FE D0 02
72C8- E6 FF 60 85 1A 29 03 85
72D0- 1B 29 02 0A 18 65 1B 85
72D8- 1B A5 1A 29 04 20 1F 72
72E0- 85 1B A5 1A 29 08 0A 20
72E8- 1F 72 09 80 4C B2 72 85
72F0- 1A 29 01 85 1B 0A 18 65
72F8- 1B 85 1B A5 1A 29 02 20
7300- 1F 72 85 1B A5 1A 29 04
7308- 0A 20 1F 72 85 1B A5 1A
7310- 29 08 0A 0A 0A 18 65 1B
7318- 09 80 4C B2 72 00
```

Hexadecimal dump of DO fun September's Apple User

```
0300- A9 58 85 FB A9 00 85 FA
0308- A5 FC 85 06 A2 00 A0 00
0310- 20 11 F4 A4 FE A2 00 A1
0318- FA EA EA 91 26 88 18 E6
0320- FA D0 02 E6 FB C0 FF F0
0328- 04 C4 FF B0 EA E6 06 A5
0330- 06 C9 FF F0 04 C5 FD 90
0338- D7 60 A9 58 85 FB A9 00
0340- 85 FA A5 FD 85 06 A2 00
0348- A0 00 20 11 F4 A4 FF A2
0350- 00 A1 FA C9 7F F0 15 C9
0358- 01 90 11 86 F9 4A 26 F9
0360- E8 E0 07 90 F8 4A A5 F9
0368- 90 02 09 80 91 26 C8 E6
0370- FA D0 02 E6 FB C4 FE 90
0378- D6 F0 D4 C6 06 A5 06 C9
0380- FF F0 04 C5 FC B0 BF A9
0388- 58 85 FB A9 00 85 FA A5
0390- FD 85 06 A2 00 A0 00 20
0398- 11 F4 A4 FE A2 00 B1 26
03A0- 81 FA 88 18 E6 FA D0 02
03A8- E6 FB C0 FF F0 04 C4 FF
03B0- B0 EC C6 06 A5 06 C9 FF
03B8- F0 04 C5 FC B0 D9 60 2C
```

Dynamic debugging using DDT

Colin Foster and Robert Neale show how to use DDT.COM, the dynamic debugging tool

ONE 8080 utility supplied with CP/M 2 which is useful if only in the absence of anythng better, is DDT.COM which stands for dynamic debugging tool. This is a CP/M debugger which allows us to load files from disc and control program execution as well as examine and change memory.

The best way to learn about DDT is to load and use it, so with a copy of your system disc in the logged drive issue the command DDT.

DDT will sign on with a – (minus sign) as prompt.

There are 12 commands known to DDT (see Figure I). Generally each is a single character, upper or lower case, which may be followed by hexadecimal numbers signifying addresses or values.

Try the command d0 at the – prompt. You will see 192 bytes of memory displayed from address 0000h onwards. The first number in each line is the address of the first byte displayed; 16 bytes are then displayed in the line from that address.

At the end of the line are the Ascii characters which the values in memory might represent. If the value is not a printable character a dot is printed instead.

This Ascii field makes it easier to spot and read blocks of text. You can examine a disc file by loading it inot memory either from within DDT by using the I and R commands or by giving the disc file name when invokding DDT.

For example, to examine STAT.COM; from within DDT issue two commands:

```
istat.com
```

(which initialises the FCB) and :

```
r
```

(which reads the file specified in the FCB) Then, from the command level issue the command:

```
ddt stat.com
```

The file is loaded into the TPA as if it were the program about to execute, and DDT displays status information of the form:

```
NEXT PC
1580 0100
```

NEXT tells us the first free memory location above the loaded program and PC tels us the address pointed to by the program counter. The address of 0100h is the default which is used by commands such as D if you enter them without specifying an address.

If you wish to change a program with DDT carefully note the value of NEXT; you will need it to calculate the number of programming pages (256 bytes each) in which the program sits if you intend to save the changed version to disc.

To exit DDT just type ^C and if you wish to save a changed version use the CCP SAVE command to write it to disc. The humber of pages to save from our example above would be 21.

This is calculated as follows: The next address is 1580h and the start address is 0100h, therefore there are 1480h bytes to save.

That is 15h pages (each page is 256 or 100h bytes) and 15h is 21 decimal. Remember that SAVE expects the number of pages to be expressed in decimal, but DDT works in hexadecimal.

We have seen DDT load a binary file (COM file) but it will also take a .HEX file such as the output from assemblers like ASM, and convert it to binary as it loads.

The G command will execute code in memory. You can specify the entry address and one or two breakpoints. For example, typing g will execute the code starting at whatever the current value of the program counter is while g100,124,3c00 will execute code starting at address 0100h, but will first insert a breakpoint (code RST 6) at addresses 124h and 3C00h.

DDT keeps track of the contents of the processor registers being used by the program being debugged so that you can examine and change any one of them with the X command.

For example, typing:

```
x
```

will display the current contents of all the registers.

Typing:

```
xp
```

will display the current value of the program counter. If you follow the xp command with a press of the Return key the program counter will not be changed, but if you first enter a hexadecimal number the program counter will be changed to reflect the new value.

Similarly, xa will let you alter the accumulator, xb, xd, and xh will let you alter the double registers BC, DE and HL and xs lets you alter the stack pointer.

The T command will trace through the program, displaying the contents of the registers after each instruction.

Typing:

```
t
```

will trace a single instruction, typing t20 will trace 32 instructions.

The associated command u will execute the specified number of instructions, but will only display the register contents once, at the end of the last instruction

This is useful for tracing a piece of code

CP/M

Part 6

A	Assemble, enter assembler code.
D	Dump, display the contents of memory in hexadecimal and Ascii.
F	Fill memory, with specified constant.
G	Go, start a program executing from given address.
H	hex, display hex.
I	Input, set the FCB ready for the read command.
L	List, disassembled contents of memory.
M	Move, move a block of memory.
R	Read, the file specified by I is read into memory.
S	Substitute, put new contents into an address.
T	Trace, execute program with registers list at each.
U	Untrace, execute program with register list after last.
X	Examine, list or alter register value.

Figure I: The DDT commands

such as a subroutine, and checking the registers only on entry and exit without cluttering the screen with all the intermediate results.

Unfortunately there is an important limitation to the usefulness of the trace commands – DDT is an 8080 utility and so only understands the subset of the Z80's instruction set which the older 8080 is able to execute.

This means that if we try to trace a program written specifically for a Z80, DDT will almost certainly meet an instruction which it does not understand.

When tracing, the consequences of this are unpredictable but tend to be brief, spectacular and fatal. (When listing you will merely be presented with a question mark, implying that DDT does not understand the instruction).

Remember, if you intend to debug a program using DDT you must either write in 8080 assembly language and use ASM, or if you have a Z80 assembler, restrict yourself to using the instruction for which there are 8080 equivalents (see the table in last month's article).

Assembler mode

The same restriction applies to another useful facility, DDT's line assembler. Typing:

```
a100
```

will put you into the assembler mode and redisplay the address – 100h in this example – at which you wish to start your code.

You can then type in a sequence of 8080 assembler instructions (pressing Return after each) such as:

```
mvi c,2
mvi e,23
call 5
jmp 0
```

and DDT will insert the appropriate machine code into memory. Pressing Return on its own will exit the assembler.

L does the opposite of assemble; typing l100 will display the program in 8080 mnemonics. Z80 instructions will not be recognised. For example, if you have just invoked DDT and entered the assemble language program given above, then given the command l100 the likely result is:

```
0100 MVI C,02
0102 MVI E,23
0104 CALL 0005
0107 JMP 0000
010A MOV D,D
010B MOV C,C
010C MOV B,B
010D MOV C,B
010E MOV D,H
010F ??=20
0110 ??=28
```

if using Microsoft's CP/M. The first part is our program, that from 010Ah onwards, is part of the copyright notice left in memory.

The S command allows you to step through memory altering bytes if you wish. Typing s100 will redisplay the address and show you the value of the byte at that address. Pressing Return will step on to the next byte without changing the first one.

However typing a hexadecimal number will substitute it for the value already in memory and then step to the next location. This continues until you enter a fullstop.

To move a block of memory use a command such as:

```
m100,2ff,2d00
```

This will copy the block starting at 100h and endig at 2FFh inclusive to the area of memory starting at 2D00h. The original memory is not altered.

To fill an area of memory with a value, say 0FFh, type:

```
f1000,1fff,ff
```

which will fill the area starting at 1000h and ending at 1FFFh inclusively.

DDT can perform simple hexadecimal arithmetic. Typing:

```
hx,y (x and y are hexadecimal numbers)
```

will display the sum and the difference of the two numbers.

Use DDT to examine the SPA before and after loading a file and identify the information it contains. Look at any programs you have written and practive tracing and executing the code using breakpoints.

You'll be making a lot of use of DDT or something very similar if you start writing programs to run under CP/M, so it is well worth learning how to use it properly.

There are other debuggers around, CP/M3 for example has a more powerful one called SID (Figure II), but all work in very similar ways to DDT. Frequently even the commands are the same – some can just do more than DDT.

There is a trade-off however. The more powerful a debugger, the bigger it is. when you run a debugger the first thing it does is to relocate itself up into high memory just ▷

Assss	Assemble starting at address ssss.
Cssss	Call subroutine at ssss.
Cssss,v1,v2	Call subroutine with v1 in BC and v2 in DE.
D	Dump memory as with DDT.
Dwssss,eeee	Dump from ssss to eeee with 16 bit word format.
Efile1	Load file with name file1.
Efile1,file2	Load file1 and file2 as symbol table to be used.
Fssss,eeee,c	Fill memory from ssss to eeee with cs.
G	Go as with DDT.
H	Hexadecimal values as with DDT.
Ifile1	Input filename file1 to FCB as with DDT.
L	List as with DDT.
M	Move memory as with DDT.
Pssss	Sets location ssss as a passpoint for counting.
Pssss,i	Sets location and initialises value of counter to i.
R	Read in the file given in FCB.
Ro	Read file in FCB to 100h plus the offset o.
S	Substitute as with DDT.
SWssss	Substitue but with 16 bit words.
T	Trace.
U	Trace with last register info only.
V	Display current SID values
Wfile,sss,eeefile	Write the contents of memory from sss to eee using filename.
X	Examine registers as with DDT.

Figure II: The SID commands

No.	Function	Input parameters	Output parameters
0	System reset	None	None
1	Console input	None	A=char
2	Console output	E=char	None
3	Reader input	None	A=char
4	Punch output	E=char	None
5	List output	E=char	None
6	Direct console I/O	E=0FF else	A=00h (no char ready) A=char (if char ready)
7	Get IOBYTE	None	A=IOBYTE
8	Set IOBYTE	E=IOBYTE	None
9	Print string	DE=address of string	None
10	Read console buffer	DE=address of buffer	buffer has char
11	Get console status	None	A=00 (no char ready) A=0FF (char ready)
12	Return version number	None	HL=version number

Figure III: The non-disc BDOS function calls

◁ below the BDOS. When you load other programs it fools them into thinking htat it is part of the BDOS and so is not overwritten by them.

However this does mean that the TPA is reduced in size by the length of the debugger. It also means that it is difficult to look at the CCP and BDOS.

Last April an Appletip from Peter Wilson showed a way round this problem, and it is worth repeating here. Load DDT as normal and then enter L160. You will see the instruction MOV A,M.

Alter this to MVI A,3D with the A command. Exit DDT with a ^C and save the new version with the command:

SAVE 20 A:BUG.COM

This file, BUG.COM, will be our non-relocating DDT, useful for looking at BDOS.

Last month we introduced the concept of BDOS function calls, which are routines within the BDOS which we can use to carry out particular functions for us by calling them in a standard way.

They fall into two groups, those concerned with disc functions and those which are not.

We will start with the latter group, as they are simpler to understand. Figure III lists the 12 non-disc function calls with any parameters which they expect to received and which will be returned.

```
; Program to demonstrate the use of BDOS
; function 2 – CONOUT – by printing
; a '#' on the screen.
;
        org     100h        ;start at base of TPA
;
conout  equ     2           ;function number for conout
warm    equ     0000h       ;warm boot entry at start of TPA
bdos    equ     0005h       ;BDOS entry point
;
start:  ld      c,conout    ;function number into C
        ld      ,'#'        ;character into E
        call    bdos        ;go do it
;
        jp      warm        ;finish by restarting CCP via
                            ;warm boot
        end
```

Figure IV: Z80 assembly language form.

We will examine them individually next month. For the moment we'll look at how they are evoked.

As an example, we'll use function 2, the console output, often abbreviated to CONOUT. This will print a character on the screen. From Figure III you will see that the BDOS expects the character which we want to print to be in register E and it will return nothing. In other words, we will not get any erro messages back, as can happen if things go wrong with more complex functions.

In register C we put the function number and then we CALL 5 to execute the program. This is demonstrated in the short assembly language program given above as an assemble example.

It will put a # on the screen and then perform a warm boot by jumping to address 0000h in the SPA. This contains another jump into the BIOS to perform the warm boot and return us to the CCP prompt.

User unfriendly

Jaromir Smejic finds room for improvement in a Macroworks utility

THE Macroworks utility from Beagle Brothers (Ver 1-0) is OK for the AppleWorks word processor, but nowhere in the manual do you find a warning about how unfriendly the built-in macros can be to your database files, especially if you are working in multiple records layout.

In the single records layout their behaviour is more annoying – adding characters to the field and a jumping cursor – than dangerous.

The most annoying and sometimes deadly commands (to your database file, naturally not to you) are the following (all beginning with SA – Solid Apple command) in multiple records layout:

X: Adds to six records in succession in the same categories (under the cursor) two characters to each. You cannot Undo this.

,: Adds four characters to the right of the cursor. You cannot Undo this.

All others you can Undo with the SA-U command (please keep this command always in the macro file) if you use Undo *immediately* after the improper SA command:

D: Delete complete record under cursor.

W: Delete complete record under cursor.

Y: If cursor is, for example, on record 5, this command deletes completely records 2 and 3.

Z: Zap complete file to end. Only the last record remains.

Space: Deletes character under cursor.

These commands write two characters to the right of the cursor and then invoke the main menu: C, I, J, K, L, M, O, Return.

They invoke the Find function, looking for two characters, and after that invoke the main menu: G, Q, Cursor down.

The remaining commands either fulfil their function (for example S: Save and Remove file from Desktop) or behave only erratically (for example Tab: cursor jumps four records down and two categories to the right).

In spreadsheet files: D, Y, Z delete one row, but that can be Undone. Other SA commands are more annoying rather than dangerous.

Finally one golden rule: Never use these macros outside the word processor files.

Do look with me for another, not so hazardous, utility – and let us all know if you find one!

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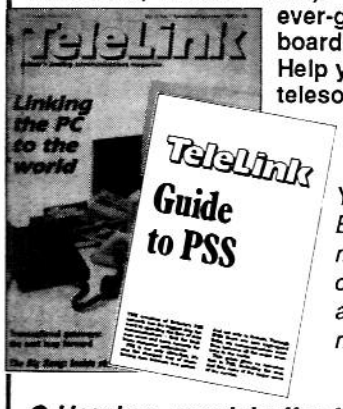

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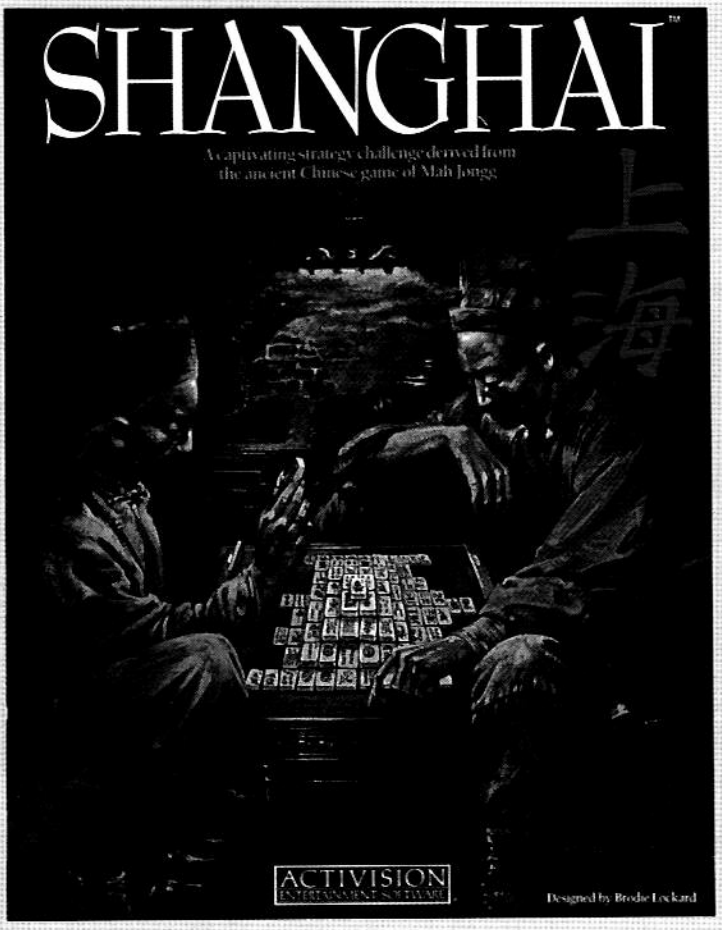

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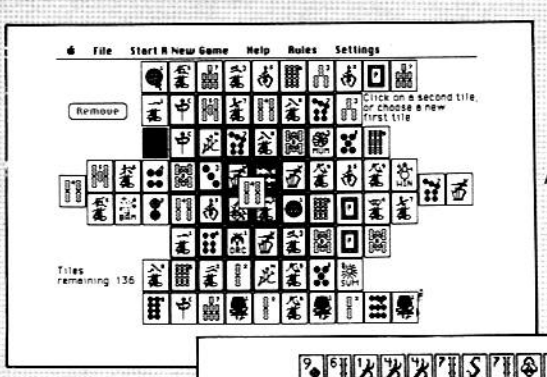
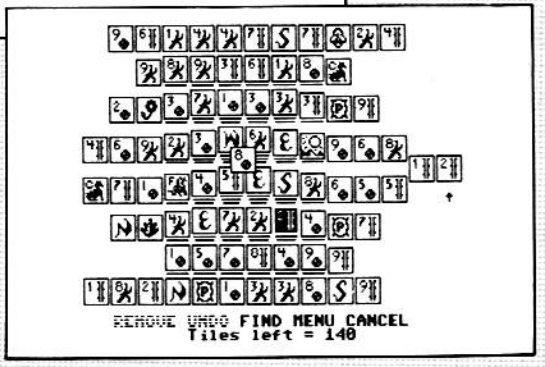


Macintosh version



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The Ultra approach

Continuing the listing for Colin Davies' cypher system program

```
830D:          362 ********************************
830D:AA        363 THROBD2 TAX
830E:BD 38 83  364         LDA  PBD2,X
8311:60        365         RTS
8312:          366 ********************************
8312:          367 PBD1    DS   38
8338:          368 PBD2    DS   38
835E:          369 PBDBUF  DS   38
8384:          370 ********************************
8384:20 CC 83  371 CONFIG  JSR  SETMODE   ;ENCIPHER/DECIPHER
8387:20 AE 83  372 LOOP33  JSR  FITROT    ;INSTALL ROTORS
838A:20 C8 86  373         JSR  MSGOUT
838D:8D        374         DFB  $8D
838E:C5 CE D4  375         ASC  'ENTER/KEY-->'
8391:C5 D2 AF
8394:CB C5 D9
8397:AD AD BE
839A:00        376         DFB  00
839B:20 0D 84  377         JSR  SETROTS   ;INITIALISE ROTORS
839E:C9 FF     378         CMP  #$FF
83A0:F0 E5     379         BEQ  LOOP33
83A2:C9 00     380         CMP  #0
83A4:F0 07     381         BEQ  EXIT23
83A6:20 68 84  382         JSR  SETPBDS   ;SET UP PBD1 & PBD2
83A9:C9 FF     383         CMP  #$FF      ;KEY TOO SHORT AT FILPBD LEVEL
83AB:F0 DA     384         BEQ  LOOP33
83AD:60        385 EXIT23  RTS
83AE:          386 ********************************
83AE:          387 ********************************
83AE:A9 00     388 FITROT  LDA  #0
83B0:85 1C     389         STA  DO61
83B2:85 1D     390         STA  DO62
83B4:A2 25     391         LDX  #37       ;INITIALSE ROTORS
83B6:BD A9 89  392 LOOP14  LDA  ROTID,X
83B9:9D 37 89  393         STA  ROT1,X
83BC:BD CF 89  394         LDA  ROT2D,X
83BF:9D 5D 89  395         STA  ROT2,X
83C2:BD F5 89  396         LDA  ROT3D,X
83C5:9D 83 89  397         STA  ROT3,X
83C8:CA        398         DEX
83C9:10 EB     399         BPL  LOOP14
83CB:60        400         RTS
83CC:          401 ********************************
83CC:20 C8 86  402 SETMODE JSR  MSGOUT
83CF:8D        403         DFB  $8D
83D0:C4 C5 C3  404         ASC  'DECIPHER/OR/ENCIPHER/(D-E)'
83D3:C9 D0 C8
83D6:C5 D2 AF
83D9:CF D2 AF
83DC:C5 CE C3
83DF:C9 D0 C8
83E2:C5 D2 AF
83E5:A8 C4 AD
83E8:C5 A9
83EA:8D        405         DFB  $8D
83EB:BA        406         ASC  ':'
83EC:00        407         DFB  00
83ED:20 0C FD  408 LOOP28  JSR  RDKEY
83F0:20 ED FD  409         JSR  COUT
83F3:C9 C4     410         CMP  #'D'
83F5:F0 0A     411         BEQ  SKIP49
83F7:C9 C5     412         CMP  #'E'
83F9:F0 0D     413         BEQ  SKIP48
83FB:20 DD FB  414         JSR  BELL
83FE:4C ED 83  415         JMP  LOOP28
8401:A9 FF     416 SKIP49  LDA  #$FF
8403:85 1E     417         STA  EDFLAG
8405:4C 0C 84  418         JMP  EXIT21
8408:A9 00     419 SKIP48  LDA  #$00
840A:85 1E     420         STA  EDFLAG
840C:60        421 EXIT21  RTS
840D:          422 ********************************
840D:A5 1E     423 SETROTS LDA  EDFLAG
840F:48        424         PHA
8410:A9 00     425         LDA  #0
8412:85 1E     426         STA  EDFLAG
8414:85 EB     427         STA  GPFLAG
8416:20 4C 80  428         JSR  INPUT2
8419:C9 00     429         CMP  #0
841B:D0 06     430         BNE  SKIP50
841D:68        431         PLA
841E:A9 00     432         LDA  #0
8420:4C 67 84  433         JMP  EXIT22
8423:68        434 SKIP50  PLA
8424:85 1E     435         STA  EDFLAG
8426:C6 EB     436         DEC  GPFLAG
8428:20 42 86  437         JSR  INITPTR
842B:A0 00     438         LDY  #0
842D:B1 06     439 LOOP29  LDA  (BUFPTR),Y
842F:C9 FF     440         CMP  #$FF
8431:D0 03     441         BNE  SKIP51
8433:20 35 85  442         JSR  TOOSHORT  ;DOES NOT RETURN
8436:20 05 88  443 SKIP51  JSR  TOSTD
8439:C9 00     444         CMP  #0
843B:F0 24     445         BEQ  NEXT
843D:85 08     446         STA  TEMP
843F:C0 00     447         CPY  #0
8441:D0 08     448         BNE  R2?
8443:85 1C     449         STA  DO61
8445:20 6E 85  450         JSR  SETROT1
8448:4C 61 84  451         JMP  NEXT
844B:C0 01     452 R2?     CPY  #1
844D:D0 08     453         BNE  R3?
844F:85 1D     454         STA  DO62
8451:20 8A 85  455         JSR  SETROT2
8454:4C 61 84  456         JMP  NEXT
8457:C0 02     457 R3?     CPY  #2
8459:D0 0A     458         BNE  EXIT20
845B:20 A6 85  459         JSR  SETROT3
845E:4C 65 84  460         JMP  EXIT20
8461:C8        461 NEXT    INY
8462:4C 2D 84  462         JMP  LOOP29
8465:A9 01     463 EXIT20  LDA  #1
8467:60        464 EXIT22  RTS
8468:          465 ********************************
8468:20 90 84  466 SETPBDS JSR  FILPBD
846B:C9 FF     467         CMP  #$FF
846D:F0 20     468         BEQ  EXIT25
846F:A2 00     469         LDX  #0
8471:BD 5E 83  470 LOOP35  LDA  PBDBUF,X
8474:9D 12 83  471         STA  PBD1,X
8477:E8        472         INX
8478:E0 26     473         CPX  #38
847A:90 F5     474         BLT  LOOP35
847C:20 9D 87  475         JSR  INCROTS
847F:20 90 84  476         JSR  FILPBD
8482:A2 00     477         LDX  #0
8484:BD 5E 83  478 LOOP36  LDA  PBDBUF,X
8487:9D 38 83  479         STA  PBD2,X
848A:E8        480         INX
848B:E0 26     481         CPX  #38
848D:90 F5     482         BLT  LOOP36
848F:60        483 EXIT25  RTS
8490:          484 ********************************
8490:20 CE 84  485 FILPBD  JSR  INITPBD
8493:A9 00     486         LDA  #0
8495:85 19     487         STA  NUMBER    ;COUNTER FOR SWAPS
```

Apple*User* SPECIAL OFFERS!

The first Apple User Games Disc was one of the most popular packages we've ever offered our readers. Now comes Apple User Games Disc No. 2 – more great games that we thought were ideal but which were just too long to be printed in the magazine. And the price is still £5.95 for 7 games – that's just 85p a game!

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ALIEN ZAP – Good, old-fashioned machine code arcade game by Peter Ibbotson. Clever Apple graphics, and plenty of action.

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LIFE – This ubiquitous game has seen many forms. This latest, by Gerrard Manning, uses the hi-res screen to create new challenges.

TYPING TEST – A nice, simple game from Lawrence Tan, but one that will help improve your typing and keyboard skills. Ideal for beginners.

CARD TRICK – The computer is an excellent medium for performing feats of sleight of hand. Play tricks with cards with J. Taylor.

NOUGHTS & CROSSES – The graphics may not be sensational, but Frank Lewis shows how to play a fast game using only the lo-res screen.

THE PERILS OF PRINCESS EMMELINE – Denise McKnight invites you to face unknown foes as you immerse yourself in this adventure.

MURDER – Can you deduce who the murderer was? Roger the Lodger, maybe? And what weapon did he use – an exploding cigar?

BOMBER – Flatten the deserted city to provide a landing strip for your plane. If you're in a destructive mood you'll have a field day!

PELMAN – A two-player game of memory. Pit your wits against another human for a change – and let your Apple be the referee.

DINGHY SAILOR – We've all seen flight simulators. Now for something completely different. See how you can handle this sailing dinghy.

NIM – It may look like a straightforward game. In fact, nothing could be simpler. But YOU try beating this challenging program.

MASTERMIND – No, not the black leather chair version, but the much older, brain-bending code-breaker. It's just as compulsive!

WORD SEARCH – Hook up your printer and use this program to create your own word square puzzles to try out on your friends.

3D ENERGY FIELD – A superb three dimensional maze game. Can you escape from the labyrinth or will the energy field catch you?

Apple*User* GAMES DISCS **No. 1** STILL AVAILABLE

TO ORDER, PLEASE USE THE FORM ON PAGE 61

```
8497:85 EC     488         STA  INDEX     ;INDEX FOR I SWAPS WITH
8499:20 B8 84  489 LOOP37  JSR  GETFRE    ;CORRECT I IF NEEDED
849C:20 F5 84  490         JSR  GETKEY
849F:20 04 85  491         JSR  GETIND    ;X IN I SWAPS WITH X
84A2:A5 09     492         LDA  TEMP+1
84A4:9D 5E 83  493         STA  PBDBUF,X
84A7:8A        494         TXA
84A8:A6 09     495         LDX  TEMP+1
84AA:9D 5E 83  496         STA  PBDBUF,X
84AD:E6 19     497         INC  NUMBER
84AF:E6 EC     498         INC  INDEX
84B1:A5 19     499         LDA  NUMBER
84B3:C9 10     500         CMP  #16
84B5:90 E2     501         BLT  LOOP37
84B7:60        502         RTS
84B8:          503 *********************************
84B8:A6 EC     504 GETFRE  LDX  INDEX
84BA:BD 5E 83  505         LDA  PBDBUF,X
84BD:C9 FF     506         CMP  #$FF
84BF:F0 05     507         BEQ  EXIT28
84C1:E6 EC     508         INC  INDEX
84C3:4C B8 84  509         JMP  GETFRE
84C6:A9 FE     510 EXIT28  LDA  #$FE
84C8:9D 5E 83  511         STA  PBDBUF,X
84CB:86 09     512         STX  TEMP+1
84CD:60        513         RTS
84CE:          514 *********************************
84CE:20 E8 84  515 INITPBD JSR  CLRPBD
84D1:A9 00     516         LDA  #0
84D3:85 19     517         STA  NUMBER
84D5:20 F5 84  518 LOOP38  JSR  GETKEY
84D8:20 04 85  519         JSR  GETIND
84DB:8A        520         TXA
84DC:9D 5E 83  521         STA  PBDBUF,X
84DF:E6 19     522         INC  NUMBER
84E1:A5 19     523         LDA  NUMBER
84E3:C9 06     524         CMP  #6
84E5:90 EE     525         BLT  LOOP38
84E7:60        526         RTS
84E8:          527 *********************************
84E8:A2 00     528 CLRPBD  LDX  #0
84EA:A9 FF     529         LDA  #$FF
84EC:9D 5E 83  530 LOOP39  STA  PBDBUF,X
84EF:E8        531         INX
84F0:E0 26     532         CPX  #38
84F2:90 F8     533         BLT  LOOP39
84F4:60        534         RTS
84F5:          535 *********************************
84F5:C8        536 GETKEY  INY
84F6:B1 06     537         LDA  (BUFPTR),Y
84F8:C9 FF     538         CMP  #$FF
84FA:D0 04     539         BNE  SKIP52
84FC:A8        540         TAY            ;RETURN TO KEY START
84FD:4C F5 84  541         JMP  GETKEY
8500:20 05 88  542 SKIP52  JSR  TOSTD
8503:60        543         RTS
8504:          544 *********************************
8504:AA        545 GETIND  TAX
8505:85 08     546         STA  TEMP
8507:BD 37 89  547 LOOP40  LDA  ROT1,X
850A:20 25 85  548         JSR  CHKFRE    ;IF GOOD DOES NOT RETURN
850D:BD 5D 89  549         LDA  ROT2,X
8510:20 25 85  550         JSR  CHKFRE
8513:BD 83 89  551         LDA  ROT3,X
8516:20 25 85  552         JSR  CHKFRE
8519:E8        553         INX
851A:E0 26     554         CPX  #38
851C:90 02     555         BLT  SKIP53
851E:A2 00     556         LDX  #0
8520:86 08     557 SKIP53  STX  TEMP
8522:4C 07 85  558         JMP  LOOP40
8525:          559 *********************************
8525:AA        560 CHKFRE  TAX
8526:BD 5E 83  561         LDA  PBDBUF,X
8529:C9 FF     562         CMP  #$FF
852B:D0 05     563         BNE  EXIT26
852D:68        564         PLA
852E:68        565         PLA
852F:4C 34 85  566         JMP  EXIT27
8532:A6 08     567 EXIT26  LDX  TEMP
8534:60        568 EXIT27  RTS
8535:          569 *********************************
8535:          570 *********************************
8535:20 C8 86  571 TOOSHORT JSR MSGOUT
8538:8D        572         DFB  $8D
8539:CB C5 D9  573         ASC  'KEY/TOO/SHORT'
853C:AF D4 CF
853F:CF AF D3
8542:C8 CF D2
8545:D4
8546:8D        574         DFB  $8D
8547:D0 D2 C5  575         ASC  'PRESS/ESC/AND/REDO'
854A:D3 D3 AF
854D:C5 D3 C3
8550:AF C1 CE
8553:C4 AF D2
8556:C5 C4 CF
8559:8D        576         DFB  $8D
855A:BA        577         ASC  ':'
855B:00        578         DFB  00
855C:20 0C FD  579 LOOP34  JSR  RDKEY
855F:C9 9B     580         CMP  #$9B      ;ESC?
8561:F0 06     581         BEQ  EXIT24
8563:20 DD FB  582         JSR  BELL
8566:4C 5C 85  583         JMP  LOOP34
8569:68        584 EXIT24  PLA            ;POP RETURN ADDR
856A:68        585         PLA
856B:A9 FF     586         LDA  #$FF
856D:60        587         RTS            ;RETURNS TO CONFIG
856E:          588 *********************************
856E:AD 37 89  589 SETROT1 LDA  ROT1
8571:85 09     590         STA  TEMP+1
8573:A2 01     591         LDX  #1
8575:BD 37 89  592 LOOP30  LDA  ROT1,X
8578:9D 36 89  593         STA  ROT1-1,X
857B:E8        594         INX
857C:E0 26     595         CPX  #38
857E:D0 F5     596         BNE  LOOP30
8580:A5 09     597         LDA  TEMP+1
8582:9D 36 89  598         STA  ROT1-1,X
8585:C6 08     599         DEC  TEMP
8587:D0 E5     600         BNE  SETROT1
8589:60        601         RTS
858A:          602 *********************************
858A:AD 5D 89  603 SETROT2 LDA  ROT2
858D:85 09     604         STA  TEMP+1
858F:A2 01     605         LDX  #1
8591:BD 5D 89  606 LOOP31  LDA  ROT2,X
8594:9D 5C 89  607         STA  ROT2-1,X
8597:E8        608         INX
8598:E0 26     609         CPX  #38
859A:D0 F5     610         BNE  LOOP31
859C:A5 09     611         LDA  TEMP+1
859E:9D 5C 89  612         STA  ROT2-1,X
85A1:C6 08     613         DEC  TEMP
85A3:D0 E5     614         BNE  SETROT2
85A5:60        615         RTS
85A6:          616 *********************************
85A6:AD 83 89  617 SETROT3 LDA  ROT3
85A9:85 09     618         STA  TEMP+1
85AB:A2 01     619         LDX  #1
85AD:BD 83 89  620 LOOP32  LDA  ROT3,X
85B0:9D 82 89  621         STA  ROT3-1,X
85B3:E8        622         INX
85B4:E0 26     623         CPX  #38
85B6:D0 F5     624         BNE  LOOP32
85B8:A5 09     625         LDA  TEMP+1
85BA:9D 82 89  626         STA  ROT3-1,X
```

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```
85BD:C6 08     627          DEC  TEMP
85BF:D0 E5     628          BNE  SETROT3
85C1:60        629          RTS
85C2:          630 ********************************
85C2:A5 19     631 DECOUT   LDA  NUMBER    ;SAVE COPY OF NUMBER
85C4:48        632          PHA
85C5:A5 1A     633          LDA  NUMBER+1
85C7:48        634          PHA
85C8:A2 08     635          LDX  #8         ;5 DOUBLE ENTRIES
85CA:86 08     636          STX  TEMP       ;FLAG SET POSITIVE
85CC:A9 B0     637 LOOP4    LDA  #'0'       ;ASCII FOR OUTPUT
85CE:85 09     638          STA  TEMP+1
85D0:38        639 SUBLOOP  SEC             ;SUBTRACT POWER OF TEN
85D1:A5 19     640          LDA  NUMBER     ;LO BYTE
85D3:FD 07 86  641          SBC  TENTAB,X
85D6:48        642          PHA             ;SAVE RESULT
85D7:A5 1A     643          LDA  NUMBER+1   ;HI BYTE
85D9:FD 08 86  644          SBC  TENTAB+1,X
85DC:90 0A     645          BCC  SKIP4      ;NUMBER < THIS POWER
85DE:85 1A     646          STA  NUMBER+1   ;STORE REMAINDER
85E0:68        647          PLA
85E1:85 19     648          STA  NUMBER
85E3:E6 09     649          INC  TEMP+1     ;UPDATE ASCII DIGIT
85E5:4C D0 85  650          JMP  SUBLOOP
85E8:68        651 SKIP4    PLA             ;CLEANUP STACK
85E9:A5 09     652          LDA  TEMP+1     ;FETCH ASCII DIGIT
85EB:E0 00     653          CPX  #0         ;LAST DIGIT ?
85ED:F0 0A     654          BEQ  PRINT      ;YES PRINT IT
85EF:C9 B0     655          CMP  #'0'       ;NO IS IT A ZERO
85F1:F0 02     656          BEQ  LEADING?   ;YES IS IT LEADING
85F3:85 08     657          STA  TEMP       ;MAKE FLAG NEGATIVE
85F5:24 08     658 LEADING? BIT  TEMP       ;CHECK FLAG SIGN
85F7:10 03     659          BPL  NOPRINT    ;CHAR IS LEADING ZERO
85F9:20 ED FD  660 PRINT    JSR  COUT       ;PRINT CHARACTER
85FC:CA        661 NOPRINT  DEX             ;ADJUST TENTAB POINTER
85FD:CA        662          DEX
85FE:10 CC     663          BPL  LOOP4      ;GET NEXT DIGIT
8600:68        664          PLA             ;RESTORE NUMBER
8601:85 1A     665          STA  NUMBER+1
8603:68        666          PLA
8604:85 19     667          STA  NUMBER
8606:60        668          RTS
8607:          669 ********************************
8607:01 00     670 TENTAB   DW   1
8609:0A 00     671          DW   10
860B:64 00     672          DW   100
860D:E8 03     673          DW   1000
860F:10 27     674          DW   10000
8611:          675 ********************************
8611:20 0C FD  676 INCHR    JSR  RDKEY      ;GET CHAR
8614:C9 81     677          CMP  #$81       ;CTRL-A ABORT ?
8616:F0 27     678          BEQ  MASK       ;STANDARDISE & RETURN
8618:20 0F 88  679          JSR  GOOD?
861B:C9 00     680          CMP  #0
861D:F0 F2     681          BEQ  INCHR      ;NOT VALID REDO
861F:C9 FF     682          CMP  #$FF       ;ESCAPE INDICATOR
8621:F0 1E     683          BEQ  EXIT2
8623:C9 88     684          CMP  #$88       ;<- BS
8625:F0 18     685          BEQ  MASK       ;DONT PRINT IT
8627:A8        686          TAY             ;SAVE CHAR
8628:A2 00     687          LDX  #0         ;IF ENCIPHER
862A:E4 1E     688          CPX  EDFLAG
862C:D0 0D     689          BNE  SKIP26
862E:C9 AF     690          CMP  #'/'       ;AND SPC INDICATOR
8630:D0 02     691          BNE  SKIP24
8632:A9 A0     692          LDA  #$A0       ;PRINT SPACE
8634:20 53 88  693 SKIP24   JSR  WRAPW      ;WORDWRAP IF REQD
8637:24 08     694          BIT  TEMP       ;PHONEY BIT TEST
8639:10 D6     695          BPL  INCHR      ;FLAG SAYS DONT PRINT
863B:20 ED FD  696 SKIP26   JSR  COUT       ;DISPLAY CHAR
863E:98        697          TYA             ;RESTORE CHAR
863F:29 7F     698 MASK     AND  #$7F       ;MASK OUT BIT 7
8641:60        699 EXIT2    RTS
8642:          700 ********************************
8642:A9 41     701 INITPTR  LDA  #<BUFFER
8644:85 06     702          STA  BUFPTR
8646:A9 8A     703          LDA  #>BUFFER
8648:85 07     704          STA  BUFPTR+1
864A:60        705          RTS
864B:          706 ********************************
864B:C0 00     707 RUBOUT   CPY  #0
864D:D0 0E     708          BNE  NOTSTART   ;NOT BUFFER START
864F:A5 07     709          LDA  BUFPTR+1
8651:C9 8A     710          CMP  #>BUFFER   ;CHECK AT START
8653:D0 08     711          BNE  NOTSTART
8655:98        712          TYA             ;SAVE Y REGISTER
8656:48        713          PHA
8657:20 DD FB  714          JSR  BELL
865A:4C C5 86  715          JMP  EXIT5
865D:88        716 NOTSTART DEY             ;BACKUP POINTER
865E:C0 FF     717          CPY  #$FF       ;PAGE BOUNDARY ?
8660:D0 02     718          BNE  NOTPAGE
8662:C6 07     719          DEC  BUFPTR+1
8664:C6 19     720 NOTPAGE  DEC  NUMBER     ;DECREMENT CHAR COUNT
8666:A9 FF     721          LDA  #$FF
8668:C5 19     722          CMP  NUMBER
866A:D0 02     723          BNE  SKIP6
866C:C6 1A     724          DEC  NUMBER+1
866E:C6 E3     725 SKIP6    DEC  LPOS
8670:D0 06     726          BNE  SKIP38
8672:A9 50     727          LDA  #80
8674:85 E3     728          STA  LPOS
8676:C6 1F     729          DEC  LINUM
8678:98        730 SKIP38   TYA             ;SAVE Y REGISTER
8679:48        731          PHA
867A:20 10 FC  732 LOOP17   JSR  BS         ;BACKUP CURSOR
867D:A9 A0     733          LDA  #$A0       ;SPC CHAR
867F:20 ED FD  734          JSR  COUT       ;PRINT IT
8682:20 10 FC  735          JSR  BS
8685:A9 FF     736          LDA  #$FF       ;IF DECIPHER
8687:C5 1E     737          CMP  EDFLAG
8689:D0 11     738          BNE  SKIP37
868B:A9 01     739          LDA  #1         ;AND FIRST CHAR OF BLOCK
868D:C5 09     740          CMP  TEMP+1
868F:D0 06     741          BNE  SKIP23
8691:A9 05     742          LDA  #5         ;ADJUST 4 COUNTER
8693:85 09     743          STA  TEMP+1
8695:D0 E3     744          BNE  LOOP17
8697:C6 09     745 SKIP23   DEC  TEMP+1     ;IF BLOCK SKIP = 4
8699:4C C5 86  746          JMP  EXIT5
869C:A9 FF     747 SKIP37   LDA  #$FF       ;EXIT IF CALLED BY
869E:C5 08     748          CMP  TEMP       ;DOWRAP
86A0:F0 23     749          BEQ  EXIT5
86A2:A9 50     750          LDA  #80        ;IN ENCIPHER MODE SO
86A4:C5 E3     751          CMP  LPOS       ;CHECK IF LAST CHAR OF LINE
86A6:D0 1D     752          BNE  EXIT5
86A8:A6 1F     753          LDX  LINUM      ;YES SO SKIP BLANKS
86AA:BD 1F 89  754          LDA  SPACES,X
86AD:A8        755          TAY
86AE:A9 00     756          LDA  #0         ;RESSET BLANKS TO 0
86B0:9D 1F 89  757          STA  SPACES,X
86B3:98        758 LOOP21   TYA             ;ERASE BLANKS
86B4:48        759          PHA
86B5:C0 00     760          CPY  #0
86B7:F0 0B     761          BEQ  EXIT18
86B9:20 10 FC  762          JSR  BS
86BC:C6 E3     763          DEC  LPOS
86BE:68        764          PLA
86BF:A8        765          TAY
86C0:88        766          DEY
86C1:4C B3 86  767          JMP  LOOP21
86C4:68        768 EXIT18   PLA             ;CLEANUP STACK
86C5:68        769 EXIT5    PLA             ;RETORE Y REGISTER
86C6:A8        770          TAY
86C7:60        771          RTS
```

● *The listing will be completed next month.*

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"I can really review **SuperPaint** in two words: Get it!" - *Sharon Aker, MacUser (US), Feb '87*
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The MacSerious Top 10
February 1987

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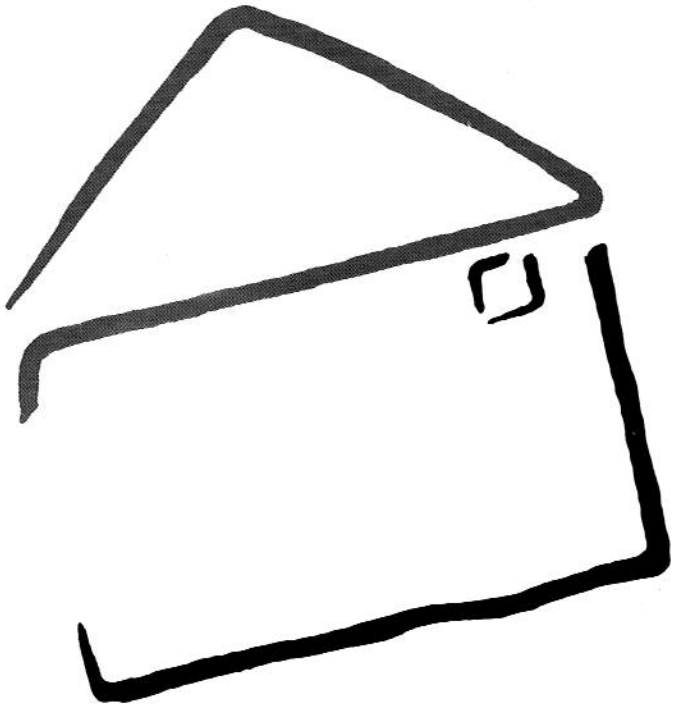

Mystery card

I WOULD be very grateful if you could offer some advice which might help with a hardware problem I have. My][Europlus contains an 80 column card which apparently cannot be identified (it is the type with a trailing lead for video output, rather than the pukka Apple version which I use on a IIe, which takes input/output through the slot) and the two main problems present are:

● *The text output starts right over at the left hand side of the screen, instead of being nicely centralised.*

● *Despite a lack of any instructions, I have found most of the soft switches, but I cannot find how to revert to 40 column output from software (Control-Reset works in direct mode) and another peculiarity is that PR#3 and Control-Reset do not clear the screen; only chr$(12) and HOME respectively do.*

I am wondering if it is possible that I have got a card designed for a IIe? If not, is there any way of adjusting the firmware on the card to give a centralised video output?

If this should present difficulties, could you advise me on the cheapest, but effective way to upgrade the Apple II to the same standard as that of a non-extended 80 column IIe? (I already know about the Flipper or similar, but £300 or thereabouts is not peanuts!).

One other item of information which would assist me is the publisher of Beneath Apple DOS as I feel ready to attack it. The price would also be an advantage. – **J.L. Risdon, York.**

● It is probably best to alter the horizontal adjustments on your monitor to move the text to the right. PR#0 will revert to 40 column text, but you may have to move the monitor lead back to the 40 column output.

There may be commands such as Esc4 or ↑ x to effect the same.

The keyboard needs to be adjusted to give lower case to come up to IIe standards. Some 80 column cards give software or hardware lower case and revision 7. Apple pluses can have the keyboard board adapted to return lower case.

CP/M colour

I AM interested in obtaining colour with CP/M and wonder how to do it. I have an Apple IIe with DMS30 colour card and Microvitec 1451 monitor.

In Applesoft the POKE 50944,69 brings green on black, POKE 50944,65, light blue on black, and so on.

However I do not know how to do this with CP/M, and would prefer to use the green on black to the white on black I now have.

Would you or a reader please let me know, in terms a novice would understand. – **John Cliffe, Chester.**

● I have not been able to test this program because I do not have the equipment, but if you try it out and let me know if it does not work I shall try to find out why.

I am assuming that you have a version of CP/M from Microsoft and that your card is a Microsoft one, or at least one which is compatible with Microsoft's.

I also assume that you have a file named DDT.COM on a CP/M disc – it is distributed with the system master disc.

First, boot up CP/M as normal and invoke the file DDT.COM with the command DDT.

You will see a sign on message and a dash. Type A100 Return. You will see 0100 and the cursor, type MVI A,45 followed by Return, and you will see 0102. Type STA E700 (Return), you will see 0105, Type RST 0, (Return) you will see 0106. Press Return alone. Now type L100 (Return), and you will see the program disassambled as:

```
0100 MVI A,45
0102 STA E700
0105 RST 00
0106
```

From here you should see some MOV instructions. Ignore them, as they are not part of our program.

Press Control-C to exit the program DDT and you should be greeted with the usual CP/M prompt. Now type SAVE 1 FILENAME.COM where FILENAME is the name of the file which you want to save your program under.

It can include a disc drive specifier if you want.

If you now do a DIR on the disc you will see the COM file FILENAME. If you execute this file when starting your CP/M session you should, with any luck, set your monitor into green on black.

Light blue on black would have been initiated by using the instruction MVI A,41 at the address 100h.

The program is quite simple – it merely loads the Z80 accumulator with the value desired to be poked in, and then stores the accumulator at the address E700h.

This address is the CP/M equivalent of the 6502 address SC700 which is where you normally poke your setup value (50944).

If you do not have Microsoft CP/M there is a chance that the 6502 address of SC700 is not the Z80 address E700h. If this is the case you will have to consult your manuals to find out the real equivalent (it may even be the same). – **Max Parrott.**

Loose lead

I RECENTLY ordered an 80 column text card for my Apple II+. The card came with no instructions on how to set it up. I placed it in slot three. There was a wire dangling down from the card. Since I don't know where to connect it, I feared that if I turned on the computer the card might break down.

The wire had a type of clip at the end of it. Can you please tell me where to connect the clip. – **Bertrand Lee, Winthrop, Australia.**

● Without knowing the manufacturer it is impossible to say. Is it a clip – in which case it could connect anywhere – or is it a video socket for your monitor lead?

User clubs

PLEASE could you tell me if there are such things as Apple User Clubs. I am particularly interested if there is a local one where one can obtain any help and advice. I use an Apple IIe with 128k and CP/M.

Over the years I have obtained a library of software from overseas, much of which is unobtainable in the UK and I am looking to ▷

◁ *exchange any copies of my existing software with any that might interest me.* – **P. Huish, Bristol.**

● Yes, there is a loose network of Apple User Clubs. Your nearest is Bristol Apple Users & Dabblers. Contact Michael Farmer, 77 Moorlands Road, Fishponds, Bristol BS16 2LG.

Prototype IIc

I HAVE been offered an Apple IIc which has, underneath it a label bearing the words "UK prototype". I would be grateful if you could let me know the difference between this model and the current production model of the IIc.

The operating system I.D. displayed on the screen on boot-up is PRODOS 1.0.1 and the prom I.D. is APPLE IIc REV A NOV 30-83.

If there are any great differences, could this IIc be upgraded and at what cost? I have contacted Apple but they could not help.

One problem that I have noticed is that the display on a normal colour TV via the modulator supplied is very difficult to read.

I have tried trimming the modulator using the control provided but am unable to improve the quality. Also I am unable to obtain a colour display on the screen.

When used with a black and white monitor, via the composite video output socket, the display is fine.

Finally, do you know where I might obtain a replacement case for a IIc, as the one on this particular model is badly damaged. – **M.C. Awbery, Beds.**

● It is difficult to know what differences there are, if any, as we have not seen a IIc such as you describe. The operating system you have is old but is loaded from disc and is not in the machine, so you can update to ProDos 1.1.1.

As far as we know all IIc modulators are pretty awful!

Subscript errors

SINCE I bought my Apple IIe several years ago I have used it very successfully with software like AppleWriter, Quickfile and Superbase.

On the few occasions that I wanted to save datafiles, I have always had trouble. I use the Dos 3.3 and follow the manual – the Dos Manual, Disk Operating System, Apple product #A2L0036 (030-0115B)

If I create a simple datafile via a basic program, like:

```
100 DIM PIM(100)
110 Z=25
120 FOR X=0 TO 100
130 PIM(X)=Z
140 Z=Z+3
150 NEXT X
160 END
```

This works all right, and all the data can be retrieved by typing:

```
PRINT PIM(..)
```

When trying to save it on to disc, I use the BSAVE command (manual p.92), for example:

```
BSAVE PIM,A$000,L$100
```

According to the CATALOG of the disc (after switching off and rebooting Dos 3.3) there is a B file called PIM on the disc.

When tyring to BLOAD this file by typing:

```
BLOAD PIM, or BLOAD PIM, A$000
```

the machine makes all the appropriate noises, but when trying to retrieve data as before by typing PRINT PIM(...) I do not get a File not found, or File type mismatch error message, but a subscript error message.

Obviously I am doing something fundamentally wrong.

Similarly, when I am trying to save and retrieve a shape table, using the instructions from the Applesoft Basic programmer's reference manual, p.150ff (which seems to me a rather roundabout way of creating shapes anyway) my time is wasted and no shape is retrieved.

I find that the Apple manuals give me all the necessary details on loading a file from a disc, but very little on creating such a file in the first place.

I do hope that you can put me on the right track. Unfortunately my local friendly dealer seems to have disappeared from the scene, so I am unable to get any help on this rather fundamental problem. – **P.A. Harthoorn, Canterbury, Kent.**

●Your example program temporarily saves in memory the value you have assigned to each of the elements of the array PIM. This you have proved by being able to print out the values of PIM as you describe.

You now wish to save these values to disc so that you have a permanent record.

Your example of saving (from page 92) of the Dos manual), namely BSAVE PIM,A$000,L$100, saves an image of the area of memory running from $000 to $100, which in decimal numbers is 0 to 256

As you have seen, you have saved this area of memory and you can reload it. However, don't worry – the worst you can do is lose your program.)

(Incidentally, this area of memory you have BSAVEd is "special" to the 6502 processor and Basic and you shouldn't use it until you have more experience. However, don't worry the worse you can do is lose your program).

There is a way of saving your Basic variables to disc as an image of memory, but until you know more of the inner workings of Basic and of the 6502 it is best left alone.

The recommended way of saving these variable is in sequential file as described in the chapter starting on page 47 of your Dos manual.

Your example program could be extended to save the variable by the addition of the lines:

```
160 D$=CHR$(4)
170 PRINT D$; "OPEN PIM EXAMPLE"
180 PRINT D$; "DELETE PIM EXAMPLE"
190 PRINT D$; "OPEN PIM EXAMPLE"
200 PRINT D$; "WRITE PIM EXAMPLE"
210 FOR X=0 TO 100
220 PRINT PIM (X)
230 NEXT X
240 PRINT D$; "CLOSE PIM EXAMPLE"
```

After running this program you will discover on the disc a file named PIM EXAMPLE. This contains the values of PIM. These values could be retrieved back into memory by the following program part:

```
300 PRINT D$; "OPEN PIM EXAMPLE"
310 PRINT D$; "READ PIM EXAMPLE"
320 FOR X=0 TO 100
330 INPUT PIM(X)
340 NEXT X
350 PRINT D$; "CLOSE PIM EXAMPLE"
360 END
```

Note that D$ is already set to the value of CHR$(4) by the first part of the example program. Normally these program parts would be put together into a bigger program which lets you jump to whichever part is needed at the time.

Under Dos there is no easy way of saving all the variables of a Basic program to disc. However, under the newer operating system, ProDos, you can save all your variables with one command and retrieve them with another, and I would recommend that you change operating systems.

Your problem with shape tables is almost certainly that after loading the shape table back from disc you are not informing Basic where it resides.

This is done by calculating the address of the start of the table and POKEing this address into the two bytes at 232 and 233.

To do this you need to understand a little on memory organisation and addressing.

Briefly, if the address is A then you have to calculate two values H and L as follows: H=INT (A/256) and L=A – H * 256. Then POKE 232,L and POKE 233,H

Max Parrott

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Spreadsheet secrets shared – Apple IIIs provide power behind computer bureau – Graphics DIY Part XV – Wordstar scrolling problems solved – Descartes data processing program generator – Fun & Games (Winnie the Pooh, Mickey's Space Adventure, Print Shop, Hitchhiker's Guide to the Galaxy) – Mac at the centre of a publishing revolution – Pascal Tutorial: random access files – Review of Micro Planner for Macintosh – Restore to any Data line – PLUS News, New Products, Letters and Appletips.

September 1985

Appleworks spreadsheet eases house purchase calculations – Pascal Tutorial: Units – Macintosh: Review of Lotus Jazz – Applesoft line by line comparator – Graphics dumps via a Super Serial card – Mac Publishing: Review of three page layout packages – Kitchen design based on Apple IIe – Choosing educational software – Bomb-proof input routines – Fun & Games (Skyfox, Wishbringer, Rescue Raiders) – Book reviews (Visicalc, Accounting software) – PLUS News, New products, letters and Appletips.

October 1985

&DOSFile: start of a new series – spreadsheet for home budgets – Apples in a Hertfordshire college – using Page 3 routines with a language card – Graphics DIY Part XVI – Reviews (Ramworks extended 80-column card, Computereyes and Magic digitisers) – add a factoria function to Basic – Pasca tutorial: assembly language programming – lower case Pascal – Fun & Games (Mix and Match Spotlight, Instant Zoo, Ernie's Quiz) – free sectors on disk – PLUS News, New Products Letters and Appletips.

January 1986

Spreadsheet model for sales forecasting – Pascal tutorial : speed-up techniques – Fun & Games (Colossus Chess 4.0, One Man Band) – Application: how a shopkeeper uses an Apple IIc – Reviews (Lawtant disk controller card, Lemi Midi interface) – Heapsort in Forth and Basic – Macintosh reviews (Crunch, Mac +II) – Duodisk write protect switch hardware project – &DOSFile: expansion and compression – Index to Volume 5 – PLUS News, New Products, Appletips and Letters.

February 1986

Hi-res overlay utility – Pascal tutorial: first look at dynamic memory usage – Hardware: build an interface for Snap EV1 video RAM camera – Application: Apples at home in 14th century house – &DOSFile: database and form generator – Reviews (Cirtech and Tymac printer cards) – Macintosh (reviews of Microsoft File and Ensemble) – Fun & Games (Seven Cities of Gold, Adventure Construction Set, The Pay-Off) – Using Text Page 2 – PLUS News, New Products, Letters and Appletips.

March 1986

Pascal tutorial: dynamic memory usage Part 2 – Fun & Games (Transylvania, Ring Quest, Crimson Crown) – CP/M: PIP patch to enable repeated commands – &DOSFile: RAMdisk function – ProDOS: four books reviewed – Spreadsheet: useful miles-per-gallon calculator – Comms: budget equipment interfaced to Apple Part 1 – Reviews (Speed-Loader, P-tral) – Macintosh (review of Ultraplan) – Machine code step-by-step tracer utility – Applesoft lower case input routine PLUS News, New Products and Letters.

April 1986

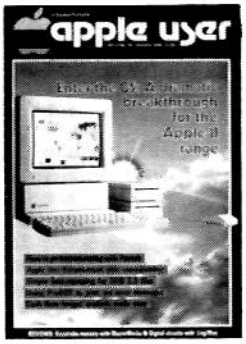
Pascal tutorial: Tips and books – Fun & Games (Mac Wizardry, Brataccas, Enchanted Scepters and Airborne) – Comms: budget equipment interfaced Part 2, software to simulate a simple teletype terminal – Spreadsheet: annual salary budgets – Graphics: machine code routine to rotate 3D wire frame images – Apples applied to slide production – Reviews (Apple's 3.5in Unidisk, Plus-Works, and BBC Basic running under CP/M) – Organisation of a ProDOS disc Part I – PLUS all the Apple news, new products and your letters.

May 1986

Making of a monster Macintosh – Fun & Games (Ultima IV Spellbreaker, Captain Good night) – Scrolling hi-res pages – Making the most of Wordstar – Spreadsheet; presenting bal ance sheets in visual form – ProDOS Part 2 – Reviews (Supercharged Apple II with Snapshot Shuttle and Cirtech Flipper, Jeeves for desktop facilities) – DOS amendment t display free sectors – Appli cation! Apples in use in technical college – PLUS all th latest Apple news and you letters.

August 1986

Reviews (Expand the IIe's capacity with MultiRam, Full-text, New Zealand-derived word processor) – MicroLink update – Part 3 of Paul Sinnett's hi-res picture editor program – Fun and Games (Elite, Chess, Balance of Power, Bond's Tale) – Spreadsheet: How to get wealthy on the Stock Market, Part II – Pascal: D. Jones' dump for Imagewriter, J.P. Lewis grapples with Boolean logic – Using UltraTerm more fully – CP/M: Automate Wordstar – PLUS all the latest Apple news and lots of your letters.



September 1986

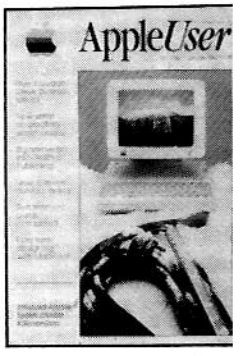
Graphics: Print Shop expanded – Game: Brick Shoot Out – Utilities (Simplify graph production, date stamp IIc files, print formulae with Practical II) – Fun and Games (Ballyhoo, Ootopos, Clip Art for Newsroom, and Ultima II) – MicroLink update – Spectagram: Colour for the Apple II+ – Perfect pitch with Guitar Tuner – Reviews (Comprehensive Interface System and Acqsoft for laboratory data, Pinpoint, Cirtech's Z80 board and CP/M Plus) – PLUS all the latest Apple news, New products and your letters.

October 1986

Reviews: The new Apple II GS, the Macroworks utility for Appleworks, circuit design with Logimac, Your Best Interest (book) – Utilities: Mousekeeping with Pascal, ProDOS error messages, Date-stamping DOS 3.3 files, Handling dates – Fun & Games: Trinity, The Hobbit, Stickers, MacGolf – MicroLink Update — Game: Space Cargo (listing) – Business: How to prepare Cash Flow Budgets – Hardware: Installing enhanced and standard roms in the IIe – PLUS all the latest Apple news, new products and your letters.

November 1986

Reviews: Peanut external drive for the IIc – MacTel: the Macintosh Bulletin Board – Switchback: An American only answer to roms problem of the IIe – More on the Ultraterm – Apple UCSD Pascal 1.3 – Utilities: Prodos system file finder, Hires picture shrinker – Pascal Tutorial: – Graphics: – Fun & Games: Science Toolkit, MacInooga Choo-Choo, Leather Goddesses of Phobos, Theatre Europe – CP/M: New series – Desktop Publishing: It's growth is examined – Game: Dodge it – PLUS all the latest Apple news.



December 1986

Review: MacServe – AppleWorld. A full report on Apple's event of the year plus a look at the Education Conference – Desk Top Publishing: Six pages covering all the news on this up and coming market. Programming: CP/M and Pascal Tutorials – Utilities: Appointment Program & Extra Basic commands – Fun & Games: Silent Service, Moonmist, Puzzle Master – Plus all the Apple world news, details of the latest products and your letters in the popular Feedback feature.

January 1987

Review: Format-80 Scientific Ramfactor and Multiram memory cards, Autoworks Programs: Electronic Orrery Text encoding – Tutorials: CP/M I/O devices & Pascal screen control – Interview with Steve Wozniak – Desk top publishing: Five pages covering the news on this up & coming market – Fun & Games: Toy Shop, Artic Fox Decision in the Desert and Graphics Expander Vol. 1 Utilities: Form making with MacPaint – Report on Apple U trip to Kilimanjaro – Index t 1986 Apple User.

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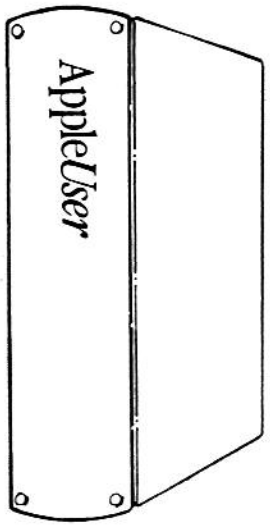


November 1985

Graphics Library final part plus disc offer – MEMDOS operating system – calculating duty rosters with a spreadsheet – Macintosh: reviews of Microsoft's Excel and P&P's fat Mac upgrade – ProDOS gives Applesoft new lease of life – Review of Cirtech CP/M Plus system for IIc – Apple word processors compared with MS-DOS counterparts – &DOS-FILE: two more routines added – Pascal tutorial: parameter passing – extra tracks on discs – Fun & Games (Suspect, Karateka, Dazzle Draw) – PLUS News, New Products and Letters.

December 1985

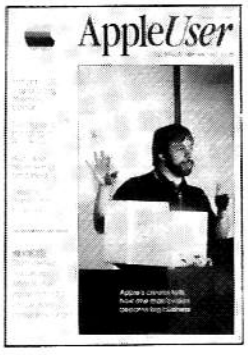
Hardware project to improve video output – Pascal Tutorial: bomb-proofing programs – &DOSFile: data compression techniques – date calculations with Multiplan – Application: Apples in an academic household – Review of DDTe debug card – Macintosh: reviews of MacType and Mac the Knife Fonts – Fun & Games (Sword of Kadash, Cutthroats) – Sliding block puzzle in Metacraft's Forth – Apple User Games Disc offer – PLUS News, New Products and three pages of readers' letters.

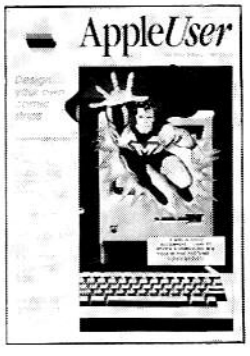
June 1986

Hi-res Picture Editor Part 1 – Fun & Games (Carmen Sandiego, Newsroom, Scamper) – Spreadsheet: Check your electricity bills – Reviews (Graphworks, Resolution 64, Flipper) – Renumber long programs using Exec – An easy way to edit Programs with a Word Processor – Hangman with BIG letters: Ideal for the disabled and poor sighted – Word Squares Generator – ProDos manuals revisited – Application: Apples in newsagents' shops – PLUS all the latest Apple News, New products and your letters.

July 1986

Word Square: Answer to last month's puzzle – Spreadsheet: Chris Burridge creates a model based on Stock Market securities – Fifth birthday review – Fun & Games (Alter Ego, Déjà Vu, The Adept) – CP/M: Beat its hidden areas – Thin Mac into Mac-Plus – Application: Engineering students using Apple IIs – DOS update for lower case commands – Retrieving Pascal disc directions – Part 2 of Paul Sinnett's hi-res picture editor program – IIc graphics dump – PLUS all the latest Apple news and your letters.





February 1987

Reviews; Transwarp, Multiscribe, AppleWriter (an overview), Dots Pfect and two hard discs – MacBottom and Hyperdrive – Programming: More printer control in Pascal, PIP & STAT in CP/M, & programs to give instant DOS 3.3 and auto line numbering under DOS & ProDOS – Interview: Second part with Steve Wozniak – Desk Top Publishing: Newspapers and Journals & The Wordsmith – Fun & Games: Standing Stones, Mind Pursuit, Uninvited, Mask Parade and The Pawn all reviewed.

March 1987

Reviews: Micol basic, ComicWorks and GraphicWorks for budding cartoonists – Programming: Device assignments in CP/M, file editing in Pascal, coding and decoding and playing Patience – Utilities: Booting Pascal 1.3 and customising CIA Files – Desktop Publishing: Graphics Factory visited and an update on the latest hardware and software – Fun and Games: Shanghai, 221B Baker Street and Crosscheck reviewed – PLUS all the latest Apple News and your letters.

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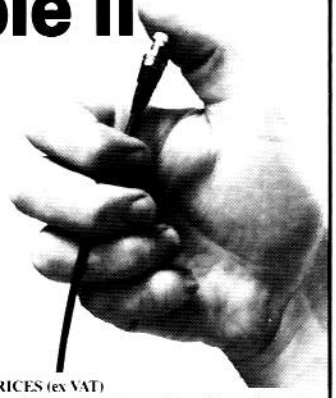

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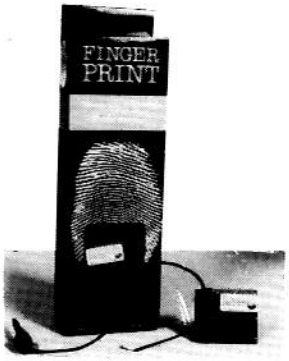

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