A Database Publication

AppleUser

Vol. 7 No. 1 January 1987 £1.25

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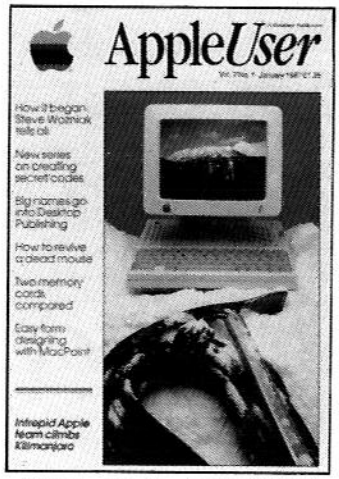

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	List Price	MCT Price
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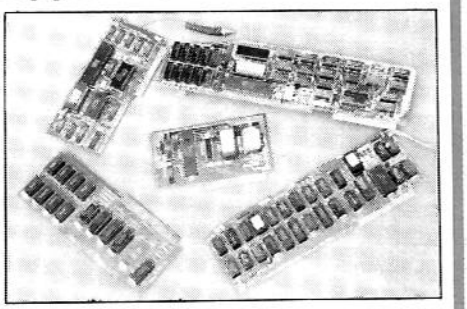

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Star SR-10 Parallel	£416.00
Star SD-10 Parallel	£331.00
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	Diskettes	£1.25

IIGS moving into the IBM market

AN AMERICAN firm has announced a product that will enable the Apple IIGS to run PC software. Orange Micro of Anaheim, California, says the device – called Dos Boot – will be available by summer.

It is expected to cost between $550 and $700 and consist of a plug-in board, software and external 5.25in disc drive subsystem.

Orange Micro is spearheading what could become a widespread rush into the IBM arena by Apple third party suppliers.

Many companies are disappointed with the amount of software available for the IIGS and want to see the machine opened up to other, existing, libraries.

"There is a fair amount of Apple II software that will run on the IIGS – but it isn't in the same league as the programs on offer for the PC and compatibles", said an *Apple User* source in the US.

"I think you will see many more companies like Orange Micro with similar ideas about expanding the appeal of the IIGS.

"If the machine is going to be a winner it needs all the help it can get. And this means giving it the kind of software support that isn't there at present, no matter what Apple Computer may think".

US Gold link ended

APPLE II simulation software publisher MicroProse has ended its association with the US Gold organisation.

Starting this month, the company will handle its own promotion, marketing and sales effort from its recently established UK headquarters.

MicroProse publishes seven titles for the Apple II – Solo Flight, F-15 Strike Eagle, Nato Commander, Decision in the Desert, Crusade in Europe, Conflict in Vietnam and Silent Service.

Flying world on a Mac

A FANFARE composed on a micro announced the opening of the latest AppleCentre in Hayes, Middlesex.

The trumpets were those of the Central Band of the RAF, Uxbridge, which loaned its musical talents for the occasion.

Squadron Leader Barrie Hingley, the band's musical director and an enthusiastic Macintosh user, composed a special fanfare for the event on his Macintosh Plus.

The RAF Central Band is an established Apple customer, with 10 Macintoshes at various locations in the UK and Europe on which it coordinates engagements and manages its massive library of sheet music.

The micros help centralise the administration of the band, from budgets to word processing and mailing lists – as well as keeping track of every piece of music it might be called on to play.

Six machines are networked at the band's Uxbridge headquarters. Three are at other RAF bases in Britain and one is in Germany, where a unit of the band is stationed.

Used primarily for word processing and database management, the Uxbridge network has storage capacity to allow for future growth of the administration.

Five 20Mb hard discs and a Symbiotic 55 Mb hard disc provide the file storage for the network.

Ten ImageWriters are used for hardcopy, printing out the band's documentation, correspondence and composed music. The system has a tape streamer for backup of essential data.

The band is planning to set up a tailor-made accounting system based on Omnis 3 and Excel spreadsheet.

When the musicians go on tour a Macintosh travels with them – together with a database, MacWrite, a 20Mb hard disc and an ImageWriter providing a mobile office for handling day-to-day administration.

Squadron Leader Barrie Hingley, director of music of the Central Band of the RAF, with his trumpeters who played a specially commissioned fanfare at the opening of the West London AppleCentre. Bob and Linda Harris hosted the event.

APPLE AID

APPLE has donated computer systems worth £80,000 to the Aga Khan Foundation's Computers in Education project in Kenya.

This is the first time Apple has made a grant to an educational project in a foreign country, and is the Foundation's first major contribution from a US corporation.

Portable Mac on its way

A PORTABLE Macintosh design produced by American manufacturer Dynamic Computer Products appears to have won approval from Apple.

Dynamic is being supplied by Apple with fully assembled Mac Plus computers at wholesale prices.

The machines will be cannibalised and reassembled to make Dynamic portables due for release early this year at a price between $5,000 and $8,000.

The Dynamic will feature a flat panel display, optional internal modem, built-in disc drive and will weigh 18lb. It will be competing with similar machines produced by Colby Systems – described in last month's issue of *Apple User* — and Intelitec.

NO SAFE PORTS?

APPLE Computer attorneys are keeping a wary eye on software firms which are porting their Macintosh programs over to the PC.

With the plethora of PC applications that look like Macintosh programs, Apple is concerned about copyright infringement.

Insiders suggest Apple may soon rewrite its contracts with software developers, barring them from writing a Macintosh-like interface into the PC version of their programs.

But the legal situation is complicated by the fact that many PC versions of previous Macintosh programs are ported via Microsoft Windows.

APPLE
January Sale

Used and Demonstration Stock

Computers	
Apple II Europlus	£100.00
Apple IIe	295.00
Apple IIc	375.00
Macintosh 128K	495.00
Macintosh 512K	795.00
Macintosh Plus	1495.00
Disk Drives	
Disk II	100.00
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Already there has been some magnificent software written for the Macintosh, but every so often a new package appears which stands head and shoulders above the rest. **Pagemaker** from Aldus is an outstanding example of such a program; but more recently another one has quietly made it's debut. In our opinion **Microsoft Works** is a must for all Mac owners; a really superb integrated program incorporating Database, Word Processor, Spreadsheet and Communications. The mail merge facility is a pleasure to use, and should prove a valuable asset to most businesses. As you would expect from Microsoft it is well documented, and many example files are provided.

At £225.00 + VAT it is underpriced!

Apple IIGS

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POPULAR PUBLICATIONS	
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Apple IIc Tech Ref Manual	23.95
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Applesoft Tutorial Manual	20.95
Apple Workshop Binder	9.00
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Excel Business Solutions	14.95
Guide to Jazz in Business	15.95
Inside Macintosh	79.95
Instant Pascal Ref Manual	22.95
Macintosh Users Handbook	13.95
Pascal Device Support Tools	35.00
Power of Appleworks & Disk	29.95
ProDOS Assembly Tools	35.00
ProDos Tech Ref Manual	19.95

Famine relief project

APPLE has joined forces with Comic Relief in the latest fund-raising project for famine relief in Africa.

The company has donated an Apple IIGS system autographed by Apple co-founder Steve Wozniak and more than £500 of software.

Wozniak, designer of the original Apple II, was also closely involved in development of the IIGS, which had its UK launch at AppleWorld in November.

The system, which will be sold in a postal auction, is one of only 10 commemorative editions available in Britain.

It has an expanded 1Mb of ram and includes two 3.5in disc drives and a high resolution RGB colour monitor. In the shops – unsigned – it would cost £1,690.

Bids for the system should be sent by post to Comic Relief, 21 D'Arblay Street, London W1.

The auction closes on February 28 and the new owner will be announced on March 1.

Eighty per cent of the money raised by the auction will go to specific famine relief projects in Ethiopia and the Sudan, and 20 per cent to rehabilitation projects in Britain.

A board game +

APPLE II users who fancy a crack at football management – without the attendant risks of the real world – will get their chance at the end of this month.

Brian Clough's Football Fortunes has been converted for the Apple II by CDS Software and should be available before February.

Unlike most other simulation software it combines a micro program with a board game.

Two to five players can take on the role of team managers, attempting to steer their clubs successfully through a season by wheeling and dealing in the transfer market.

Opposition in a 10 club league comes from fellow players and the computer itself. Price £24.95.

Test drive starts up again

APPLE has introduced a new version of the Test Drive campaign that won it a national marketing award last year.

The promotion has been redesigned to emphasise specific business solutions for Macintosh users.

Dealers have been issued with special sales packages designed to demonstrate the extensive range of business applications available for the Macintosh.

The new Test Drive promotion will run for six months, with special pricing on each of the systems as an incentive to prospective customers.

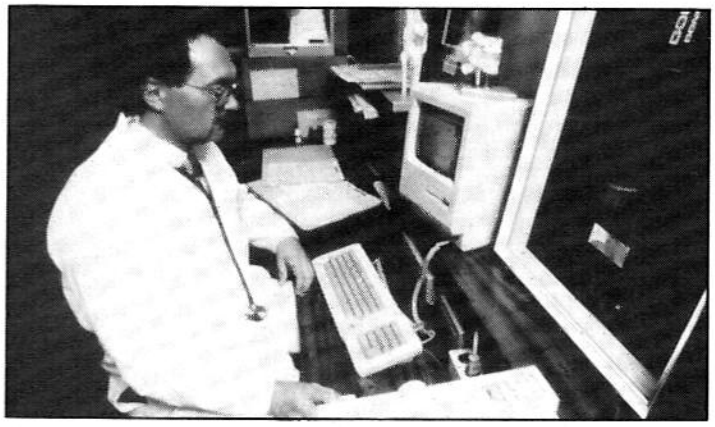
Business solutions covered in the campaign are Number-Cruncher using Microsoft Excel, Writer word processing using Microsoft Word, DeskTop Publisher using Aldus PageMaker, Information Manager using Omnis 3 Plus from Blyth Software, and Manager using Lotus Jazz integrated software.

The original Test Drive a Macintosh campaign ran in 1984 and won an award from the British Direct Marketing Association in 1985.

Apple UK business marketing manager Tony Tomkys said: "Participating dealers will be supplied with a Test Drive kit for each of the five business solutions.

"The kits have been produced in association with the world's leading software houses, and provide a 60 minute self-teach and demonstration course.

"The original Test Drive promotion allowed the prospective buyer to take a Macintosh home for a short period. The new campaign allows the user hands-on experience of the business applications available for the machine".



Clinical check-up

SPORTS medicine expert Dr John Schaman is operating research databases on Apple IIc computers at his clinic in Canada.

Facts about 5,000 patients who have been treated for sports-related injuries are contained on disc, and Dr Schaman plans to use this information to write a paper on sports medicine.

A 200 metre running track has been built next to the clinic and there is an Apple IIc alongside it.

The computer stores and updates information about the nature of each cardiac patient's condition.

This is available for instant referral as patients walk or trot around the track to build up their physical condition.

Looking after Lisa . .

APPLE enthusiast Dave Noak doesn't care if he has to stand up to do his computing.

He is so determined to get hold of an ImageWriter printer for his prized Lisa micro that he's even prepared to give his favourite piece of furniture – a leather settee – in exchange.

Electronics engineer Dave wants the equipment so he can begin providing accounting and other services to small businesses which can't afford their own computers.

He is already using the Lisa to produce budgets, records and letters for the air traffic control radio relay station where he works.

SWAP MY LEATHER CHESTERFIELD 3 str. settee for an Apple Imagewriter Printer. Tel. Dave 01 422 9001 daytime. WANTED: SPECTRUM DISC

"I'm very attached to my Lisa", he told *Apple User*. "As an office system it beats the Macintosh all ends up.

"An ImageWriter printer would put the icing on the cake as far as I'm concerned, and be well worth the loss of my leather Chesterfield".

P-tral updated

AN updated version of Woodchuck Industries' P-tral, the Basic to Pascal translation software, is now available for the Apple II.

P-tral 1.1, a disc-based program aimed at the professional, is capable of translating commercial programs, which include graphics.

It now features automatic configuration for 64k and 128k systems. Other enhancements include support of ProDOS and Apple Pascal 1.3, and the ability to handle subroutines nested up to five levels.

Price is $179 and the update charge for current users is $35.

Mapped by Mac

IN the Belgian town of Geel the local street map has been entered into a Macintosh by the town's fire brigade.

When called out to a blaze the firemen simply take the computer along with them.

Powered by the fire engine's battery, it displays the location of the fire, indicates the best route there, and pinpoints the position of hydrants.

While speeding to the incident firemen can access a database containing details of more than 1,000 methods of tackling the flames.

And on the way home the senior officer uses the micro to write up his fire report.

Input and output devices

Delve deeper into the mysteries of CP/M with Robert Neale and Colin Foster

AS we have seen, CP/M organises data and programs stored on disc into files which we can refer to by their assigned names. Obviously, if we want to store two different files on the same disc we must give them different names or CP/M will get confused and will lose one.

Files ID

Filenames have three parts, for example

A:DATA.DAT

Put more formally the filename parts are:

<drive ID> : <file ID> : <extension>

The second of these, the file ID, is the easiest to start with. It's simply the name you want to give the file – in this example it is DATA – and it can be up to eight characters long.

The third part is usually a three character extension used to give you (and sometimes CP/M) a hint as to what is in the file.

For example Microsoft Basic program files have the extension .BAS whereas M-Tecsoft's excellent BBC Basic program files have the extension .BBC and Borland's Turbo Pascal source files have .PAS.

You can use your own extensions such as .DAT in the example above and other programs/utilities may use their own. For example, .BAK is commonly used to indicate a back-up file.

The only extension which CP/M itself requires is .COM which signifies a machine code program to load and run at the transient program area starting address which is usually 100H.

The first part of the filename, the drive ID, is only relevant when you wish to access a file which is not on the default (currently logged) drive. The logged drive is generally A initially because you will have booted up your CP/M system on that drive.

However, you or one of your startup programs may have changed the logged drive to another such as C or D because this is a hard disc or a virtual disc which offers advantages in speed. To make life a little easier we can change the logged drive simply by typing the ID of the drive which we want to be the default.

Thus at the system prompt A>

A>b: (to log on to drive b:)

and then at the B> prompt:

B>a: (to log on to drive a: again).

Note that the prompt changes to tell us which drive is the default.

Thus A>dir b:
or B>dir

will list all the files on the disc in drive B while:

B>stat a:*.com

will run STAT from the disc in the default drive B and detail all the files on the disc in drive A which have the extension .COM.

Part 3

System set-up

We have already touched on the subject of transferring files between discs and user areas using the file transfer utility program PIP but before investigating it more fully we must first go into more detail about CP/M's input and output devices and the configuration of your computer.

Most CP/M systems come with a setup program of some sort to enable you to configure the system to your terminal, although the later Apple systems, such as Cirtech's CP/M 3 do not need configuring.

However, the earlier Apple systems such as Microsoft's CP/M v2 do need configuring and this has a Basic program on the system disc called CONFIGIO.BAS which performs this function.

It is run by booting the system and at the A> prompt typing:

A>MBASIC CONFIGIO

This will load and run Microsoft's Basic language which in turn will load and run the Basic program CONFIGIO which in turn picks the system information off the disc. But before doing this, copy the system disc (use COPYA from Dos or the volume handling utilities from Prodos) and run the copy rather than the original.

The reason for this is that CONFIGIO reconfigures the system straight away and it is possible to end up looking at a blank screen with an inoperative keyboard – in which case press Control+Reset to restart CP/M, possibly with your standard system disc rather than your doctored version. It depends on whether you have saved the funny system to disc.

Four major operations

CONFIGIO is menu driven and performs four major operations. It configures Microsoft's CP/M for an external terminal and will redefine the keyboard characters.

It will also load and install user written I/O software into CP/M and it reads or writes the I/O configuration block from or to the system disc.

Now most CP/M users on the Apple will have an 80 column card in slot three and it is this which may well have to be installed, together with the keyboard.

First a tip. If you are going to install an 80 column card, switch off the Apple, remove the 80 column card and restart CP/M in 40 column mode. Now configure the external terminal, make sure you save the result to disc, switch off the Apple, replace the 80 column card and restart CP/M to see if all is well.

Configuring a terminal actually involves two configurations. CP/M v2 writes to a software terminal which in turn writes to the physical hardware terminal. Both may be reconfigured.

The system comes with the software terminal set as a Soroc 120 which is probably best left as such. If you have a Videx Videoterm, Sup-r-term, or compatible 80

Function	Soroc (or software) terminal	
	Ascii Code Names	Ascii Decimal Code
Clear Screen	ESC *	27,42
Clear to end of Screen	ESC Y	27,89
Clear to end of Line	ESC T	27,84
Low lighted text	ESC)	27,41
High lighted text	ESC (	27,40
Move cursor to top left	RS	30
Address cursor	ESC =	27,61
Cursor up	VT	11
Cursor forward	FF	12
XY coordinate offset	32	
XY order	Y then X	

Figure I: Details of the Soroc (software terminal)

column card then install the hardware terminal as a Datamedia terminal.

If you have another card then select the "Other" option from the manual and carefully check your manual for the required codes which are often, but not necessarily, escape sequences.

Commercial software may now be configured for a Soroc 120 terminal which is a common option and thus is likely to appear in the terminals offered. If you have to install a terminal manually because your software does not offer the Soroc option consult Figure I which uses the standard Ascii terms.

Most Apple users will find it necessary to reconfigure the keyboard. This is because the Microsoft v2 CP/M system was written around the old Apple II/II+ which could not generate all characters from the keyboard. Microsoft in its wisdom decided to redefine certain control characters to extend the printable range.

The most annoying of these from the point of view of a Turbo Pascal or WordStar user is the fact that Control–K generates a square bracket. If you have an Apple IIe, IIc, IIGS or II+ with an enhanced keyboard then generally you will want to remove all the keyboard redefinitions that the system uses.

The easiest way of deleting the characters is to enter each as Control–x where x is the actual character. After satisfactorily removing these redefined characters make sure that you do save your new system to disc.

If you wish to redefine some characters for a particular purpose make sure that you do not redefine Control–C because you need this at CP/M level. And we would recommend that you do not redefine Control–H, Control–M, Control–J or Control–I. If you use packages such as WordStar then take particular care over the Control characters which they expect for program control.

If you have installed non-standard Apple floppy drives, a virtual disc drive or a hard disc then your extra hardware will now doubt have come with the software required to reconfigure CP/M to drive them.

However, you may want to install a driver of your own, perhaps to run a communications (serial card). In this case you can use option 3 of CONFIGIO. Note that such software has to conform to a special, internal format and you will require details from the Microsoft CP/M manual to accomplish this.

Software

Most commercial communications software does of course recognise a range of common Apple compatible serial cards such as the Apple Super Serial Card or the well known CCS card.

Note, however, that the serial port on the IIc is not strictly the analogue of the Super Serial Card and that the serial ports on the IIGS are more like the port of the Macintosh than that of the IIc. Check that any software you intend buying is in fact compatible with your machine, especially if you have one of the newer ones.

Software for other purposes is readily available, both under CP/M and on Apple format discs. And, of course, the only reason you have CP/M is to run programs.

Many CP/M programs are ridiculously over-priced and out of reach of most people but software distributors are beginning to realise this and there is some excellent software at more sensible prices.

There is another alternative. An immense amount of software, much of it of surprisingly high quality, is available in the public domain – free!

The range is vast, extending from language compilers, assemblers and utilities to text editors, adventure games and databases.

The CP/M Users Group (UK) collect and distribute hundreds of such programs and membership is really a must for anyone even remotely interested in using CP/M. If you want to find out more contact:
The Membership Secretary, CP/M Users Group (UK), 72 Mill Road, Hawley, Dartford, Kent DA2 7RZ. □

Appletip

Having already written about the use of DOS 3.3's VERIFY command in conjunction with ONERR and OPEN to determine whether a text file already exists on disc or not, I have come up with a simple solution for those programmers who wish only to access existing files, configurations etc, under both DOS 3.3 and ProDOS BASIC.SYSTEM environments.

The answer is to disable the OPEN command's ability to create a new file, if one is not found, so that you will always get an error if you try to open a non-existent file.

This method avoids having to VERIFY the file's integrity first which, under DOS 3.3, can take time with large files.

This is accomplished by changing the OPEN command's entry in the command valid keyword table. The following list gives the changes necessary to accomplish this.

To disable file creation by the OPEN command under DOS 3.3 **POKE 43299,34** and similarly under ProDOS **POKE 47505,37.**

DOS 3.3 and ProDOS BASIC.SYSTEM return the errors FILE NOT FOUND and PATH NOT FOUND respectively if attempts are made to OPEN non-existent files with this modification.

Allan Ogg

operating System	Location to change	Disable file creation	Enable file creation
DOS3.3	43299 ($A923	34 ($22)	35 ($23)
ProDOS	47505 ($B991)	37 ($25)	45 ($2D)

Geof Wood reviews one answer to a perennial problem for scientists and mathematicians where word processing is concerned

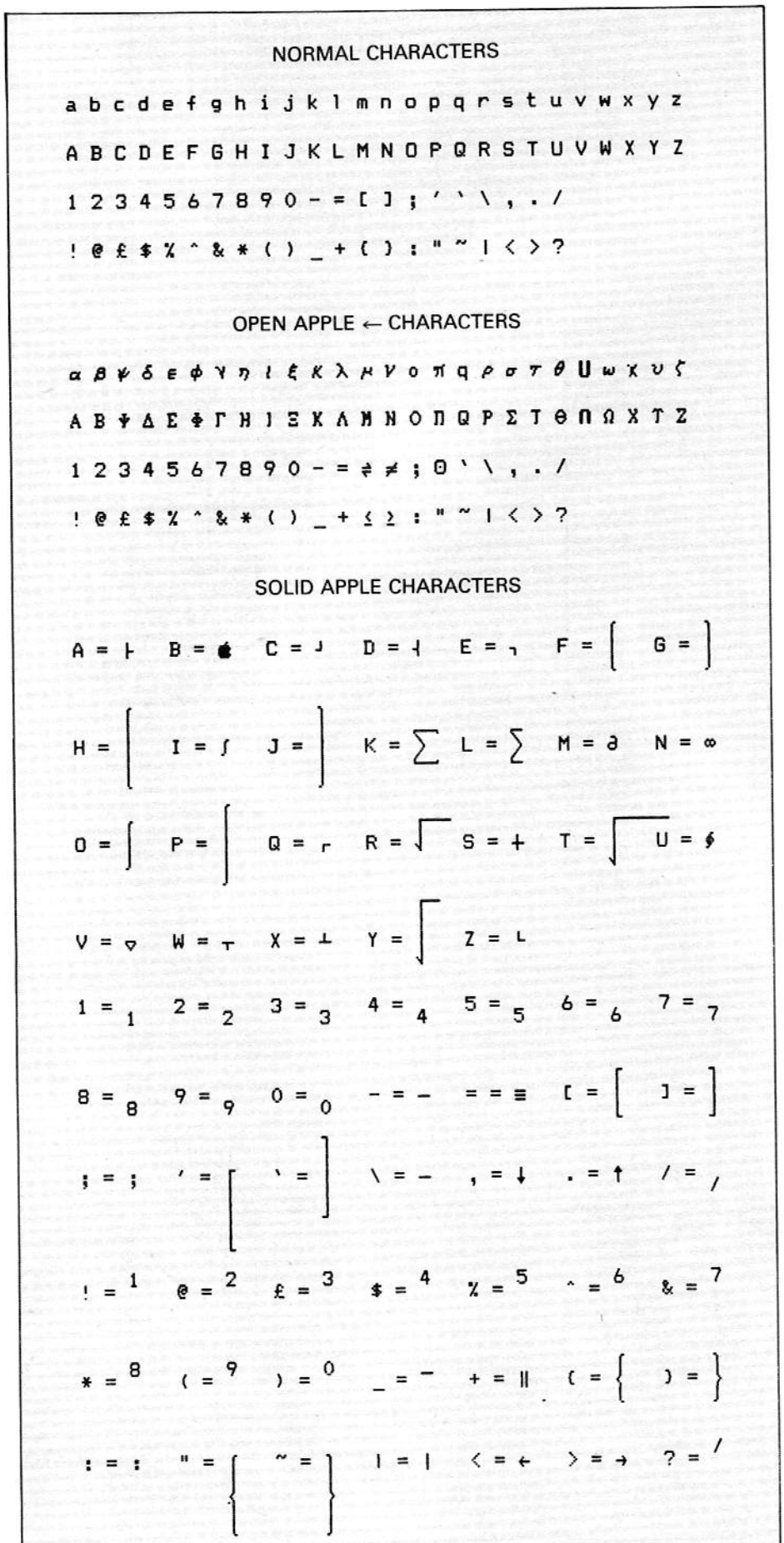


Figure I: Characters available using an Imagewriter II

MOST word processor programs can cope with a wide variety of work, ranging from simple correspondence to complex documents. Some also offer mail merge facilities. One of the most versatile is Format-80 Enhanced, now available in both Dos3.3, which also offers a simple spreadsheet, and Prodos.

But very few word processors can cope with the requirements of scientists, engineers, academics and other specialists who need a variety of symbols as well as subscript and superscript facilities. Problems lie not only with the computer which must use the normal keyboard to generate special symbols but also with the printer which must be able to print the special symbols.

Format-80 Scientific is designed to meet the needs of many scientists and professional people. It operates on the Apple IIc or IIe with 128k of ram with suitable printers such as the Imagewriter I or II, the Epson FX and MX series or the NEC Spinwriter with a Tech Math/Times Roman thimble.

Format-80 Scientific is supplied with Format-80 Enhanced but if you already have the latter you can buy an upgrade for the scientific version. The upgrade comprises a disc and a rather slim manual of only 15 pages.

You are advised to make a copy of the master disc which is not copy protected and which is on Dos 3.3, not Prodos. The program is set up to work with the Imagewriter printer but if you press Escape while the program is booting you can choose a different printer from a list. This choice automatically reconfigures the disc so you have to do it only once.

If you use an Imagewriter or the Epson FX series or compatible printer, the printer must be switched on while Format-80 Scientific is booting up, as the program downloads a special character set.

With the Epson MX range, the program sends graphics codes to the printer. Both Epson drivers assume that you have a Grappler compatible parallel interface card.

Format-80 Scientific offers three different character sets. First, it generates all the normal 96 characters found on the Apple IIc or IIe keyboard.

Or, if you press the Open-Apple key and Left Arrow keys simultaneously, the normal keyboard then generates the Greek alphabet in both upper and lower case,

FORMAT-80 SCIENTIFIC

and a few special symbols. You can revert to normal characters with Open-Apple + Right Arrow.

Finally, if you hold down the solid-Apple key and press any of the alphabet keys or certain other keys, scientific symbols are displayed on the screen. Figure I illustrates the normal characters, Greek characters and scientific symbols printed on an Imagewriter II. With the NEC Spinwriter, some of the Greek capital letters are not available.

Some of these symbols occupy more than one line on the screen and in effect, consist of two or more smaller characters connected vertically. Figure II illustrates the 96 fundamental characters, some of which are used to create the multi-line scientific symbols.

Special symbols

Before using the multi-line symbols, first hold down the Open-Apple key and press Q. This produces a special symbol on the screen and also acts as an instruction to the printer to reduce the distance between the lines so that vertically connected symbols are not printed with gaps. This is called the half line mode.

While in this mode, subscripts and superscripts can be constructed by moving the cursor down or up a line (in effect, half a line) and typing the appropriate character. In this way you can enter as many levels of subscript and superscript as you wish.

To revert to normal line spacing, use Open-Apple + N, which generates another special character on the screen and acts as an instruction to the printer. Other codes are available for double line spacing or line and a half spacing.

Normally the half-line mode is used to position subscript and superscript characters in equations, but in the normal-line mode subscripting can be achieved by Open-Apple + Down Arrow. Similarly, superscripting can be achieved with Open-Apple + Up Arrow. These commands also cancel one another.

In normal-line spacing mode, a single number can be generated by holding down the Solid-Apple key and pressing the appropriate number key. Similarly, a superscript number can be generated with Solid-Apple + Shift + the appropriate number key.

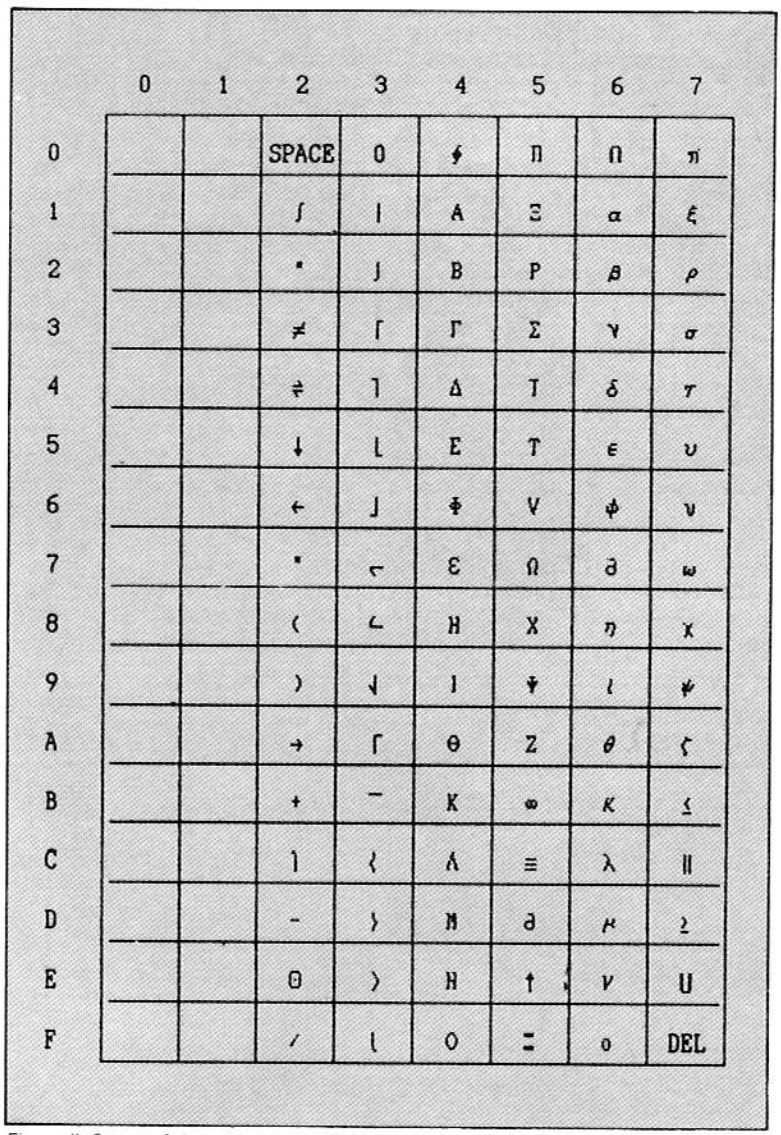


Figure II: Some of the characters shown here are used to create multi-line scientific symbols

Selecting colour

If you have an Imagewriter II and a colour ribbon you can select the colour by Open-Apple + R and entering the number of the colour.

Examples of the kind of formulae you can construct are shown in Figure III. The deep brackets occupying seven half-lines cannot be created with a single key depression and the manual does not explain how they were created. They can be built up by holding down the Solid-Apple key and pressing Q, E, Z or C to generate the corners, then using the vertical line symbol to join the corners. ▷

◁ Alternatively, you can use Solid-Apple + Left or Right Bracket key to generate two shallow brackets, one underneath the other, then replace the centre section with vertical lines.

The root symbols which are generated with Solid-Apple + R, T or Y can be extended horizontally with the character generated by holding down the Solid-Apple + Shift + Underline.

With ingenuity you can construct other symbols by combining the existing characters in various ways. When you type a single line character on top of a multi-line symbol, it replaces only that part of the multi-line symbol where the cursor is located.

Care is needed to locate some of the multi-line symbols in the right place, as some are displayed so that the centre or top of the multi-line symbol lies on the same line as the cursor.

Moreover, after some of the multi-line symbols are generated the cursor moves to another line, so you may need to reposition it before generating more characters.

Until you get used to it, if you do not watch what happens to the cursor after you have generated some of these multi-line symbols, you may find that the next character is in the wrong place. If you then try to rectify the error with the delete key you may get unexpected results.

Once you realise how the multi-line symbols are generated as a combination of separate smaller characters, corrections can be made.

Because of the way that the multi-line symbols are constructed, other characters can be located in close proximity. Figure III illustrates examples where there are up to nine different levels of characters in one inch. This feature is one of the great strengths of the program.

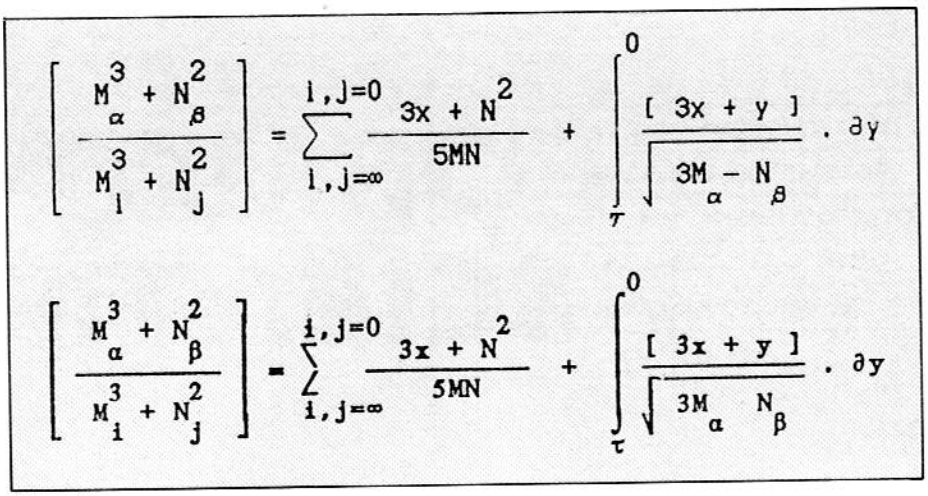


Figure III

Format-80 Scientific works – with some minor exceptions – on the WYSIWYG (what you see is what you get) principle. Complex formulae can be constructed on screen and incorporated with normal text.

Some trial and error may be needed in the early stages to achieve correct printout of the multi-line symbols, but anyone familiar with word processing should have few problems.

Anyone unaccustomed to a word processor would be well advised to learn how to use Format-80 for normal work before trying to construct complex scientific formulae. There is no problem if you simply want to use the Greek alphabet or the small symbols that occupy only a line, but some practice is needed to learn how to use the multi-line symbols.

However, if you want the facilities that Format-80 Scientific offers, it is well worth spending the time to learn how to use it. Certainly the printouts look very professional.

Elite Software can be congratulated on producing a sophisticated scientific word processor at modest cost for the Apple IIe or IIc. To obtain comparable or even inferior results on other microcomputers, you could expect to pay considerably more for both the software and the hardware.

For scientists, engineers and others who need the kind of facilities offered, Format-80 Scientific is a good buy.

● *Next month Geoff Wood will review Multiscribe – a rather different approach.*

Product: Format-80 Scientific
Price: £179 (upgrade from Enhanced: £80)
Supplier: Elite Software, 4 Hawthylands Drive, Hailsham, East Sussex BN27 1HE
Tel: 0323 845895

□

Appletip

Under DOS 3.3 have you ever had the problem of looking for a filename on a CATALOG track, and just as you've found it you see it disappearing off the top of the screen?

Well I have, so I decided to try and get a way to stop the CATALOGing, if I chose, when the Apple is waiting for a keypress. The folowing routines are the result of my efforts.

Part 1 prints out some text, then waits for a keypress – in this case anything apart from a Return.

If it is a Return the routine exits through $B37F which is the way the CATALOG would exit eventually. If it is not a Return it carries on with the CATALOG until it is finished.

Part 2 is the text that is displayed while waiting for the keypress. It can be changed to any other message you desire.

Part 3 interrupts the normal DOS CATALOG routine and, instead of waiting for a keypress it jumps to Part 1 above. The key that it is waiting for can be changed to whatever you want by altering the value at $BA7A.

Matthew Rae

Part 1

```
BA69:            9        ORG  $BA69
BA69:A2 20      10        LDX  #32
BA6B:BD DF BC   11 MESSAGE LDA  $BCDF,X
BA6E:20 ED FD   12        JSR  $FDED     ;PRINT THE STRING
BA71:CA         13        DEX
BA72:10 F7      14        BPL  MESSAGE
BA74:20 0C FD   15        JSR  $FD0C     ;GET KEYPRESS
BA77:C9 8D      16        CMP  #$8D      ;IS IT CR?
BA79:D0 03      17        BNE  CONTINUE
BA7B:4C 7F B3   18        JMP  $B37F     ;IF CR EXIT
BA7E:A9 00      19 CONTINUE LDA #0
BA80:85 24      20        STA  $24       ;SET HTAB TO 0
BA82:60         21        RTS
```

Part 2

```
BCDF:            26        ORG  $BCDF
BCDF:C5 D5 CE   27        ASC  "EUNITNOC OT RC RAB YEK YNA SSERP"
BCE2:C9 D4 CE
BCE5:CF C3 A0
BCE8:CF D4 A0
BCEB:D2 C3 A0
BCEE:D2 C1 C2
BCF1:A0 D9 C5
BCF4:CB A0 D9
BCF7:CE C1 A0
BCFA:D3 D3 C5
BCFD:D2 D0
BCFF:BA          28        DFB  $BA
```

Part 3

```
AE39:            33        ORG  $AE39
AE39:20 69 BA    34        JSR  $BA69
```

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Theatre Europe simulates the first 30 days of the war. In addition to being able to command either side, the player can choose the style of his opponent (the computer). The first level is a beginners level, where the computer opponent will not use the nuclear option. If he selects level two, the computer will play a "Rational" game following the accepted strategies of NATO or the Warsaw Pact. In level three it will play a highly unpredictable game.

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!

R.R.P.	Apple User price	Special subscription offer
£19.95	£14.95	£9.95 (+ subscription)

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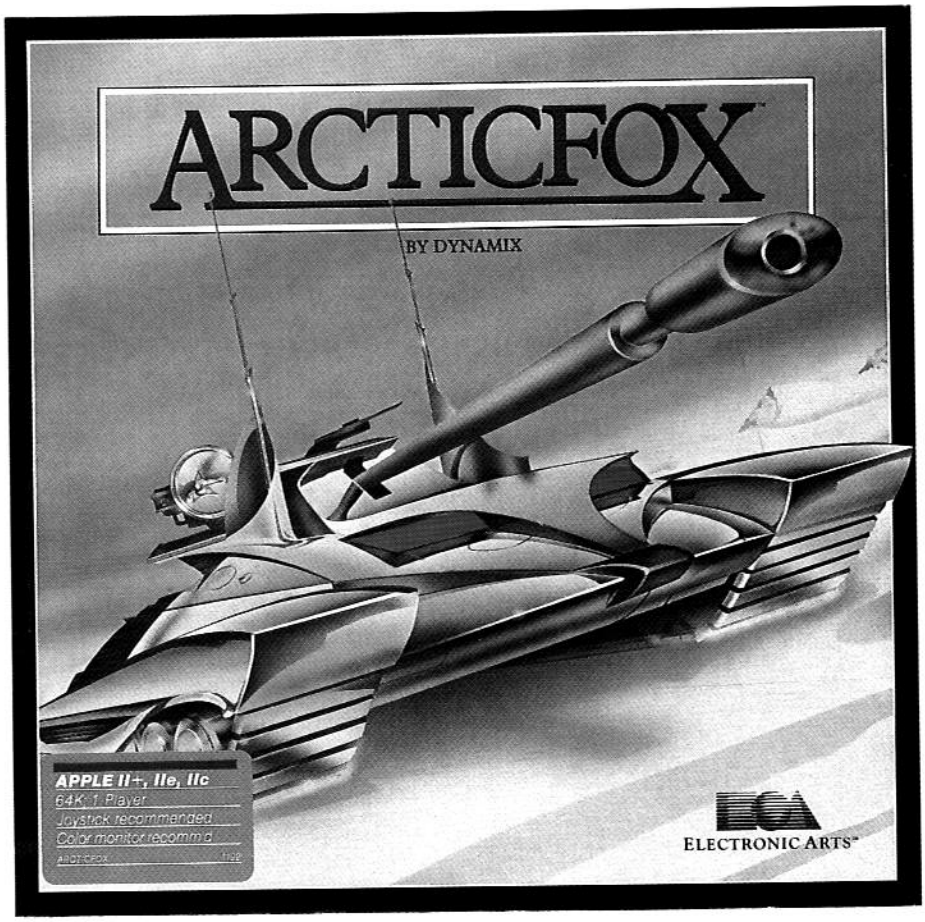
R.R.P.	Apple User price	Special subscription offer
£19.95	£14.95	£9.95 (+ subscription)

✓VOTED
America's No. 1 Apple game

TO ORDER, PLEASE USE THE FORM ON PAGE 61

Product: Arcticfox
Price: TBA
Supplier: Dynamix
Requirements: Any Apple II

From repelling aliens in a deadly polar combat . . .



IF the name sounds familiar, it's supposed to. But after a superb flight simulator by way of Skyfox, Dynamix comes down to earth with a bump with Arcticfox.

Package presentation is slick and professional, but the illustration owes more to wishful thinking than anything else. And for the price I was hoping for something a little more substantial than a 10 page manual.

The blurb, boiled down to bare essentials, informs you that Articfox is a supertank, specially designed for polar combat, which comes in handy as aliens have taken over Antarctica. (So why not Antarcticfox?)

The aliens, in addition to gradually converting earth's atmosphere to their own preferred brand, have found time to throw up a force field but neglected the loophole which will let one combat vehicle through.

If you've managed to suspend your disbelief so far, you're advised to familiarise yourself with the vehicle's controls.

And you're certainly well equipped. From your cockpit you can unleash missiles, shells and mines, leap up to 140kph, look out of the back window, use radar and even dig in to the snow to avoid detection.

You can also reverse over your own mines, so be careful.

Into the game, and four options are open to you. You'll only use enemy preview once – it introduces you to the opposition. As you'll probably blast anything that doesn't look like snow anyway it's possibly redundant, but it is the introduction.

Training mode prolongs your active life by providing you with thicker than normal armour, ample ammo and an understrength enemy. It's a good opportunity to size up the opposition and you'd be advised to take it.

Finally, in Beginner and Tournament mode, the odds get tougher and the enemy progressively more intelligent.

Commands and indicators around the screen, selected by joystick and keyboard, cover a multitude of sins, including air, ammunition and damage status.

Again, be warned – be sparing with the fire button or you won't achieve your objective.

Your most potent weapon, the guided missiles, can be steered by joystick once launched. The cannon, for which you carry rather more ammunition, is aimed through an on-screen gunsight.

You can alter its inclination, but unless you're very nifty with your fingers you'll have trouble hitting anything that isn't stationary. My technique for dealing with enemy fighters was to dig in and hide.

As your mission is to knock out the enemy's main fort it's as well to make that your objective rather than roam around at random.

You'll start anywhere on the map (provided), so keep an eye on the position indicator. The playing area is large – 66.7 miles, and liberally strewn with natural obstacles.

If your navigation is up to my standard, you'll end up with a black screen at the bottom of a crevice (sic) too.

The graphics are not awe inspiring, but they are quite varied. There's a lot of jerky movement as the opposition judders into perspective on the ground, and more as the alien airforce zooms overhead.

The scenery, made up mainly of poorly executed triangles, is a disappointment and more reminiscent of a glacier mint advert than anything else.

The terrain can be used to your advantage though – finding the larger mountains (big triangles) helps you work out where you are, and hiding behind rocks (little triangles) gives you chance to get your breath back.

The blurb warns you to watch out for "mind numbing blizzards". They're certainly mind numbing – the screen turns white.

I began conscientiously, watching all my meters, conserving my ammunition and driving carefully. I got blasted thoroughly and without quite knowing why. And what I thought I'd knocked out didn't tally with the final score sheet.

Still, I persevered. And still got blasted – and bored. Totally confused by the radar and baffled by the relative reverse, I concentrated on making every shot count. I still got blasted.

Finally I threw caution to the winds, opened up the throttle and shot everything in sight. That was a mistake too, though I suppose anyone who drives around the icecap at 140kph deserves everything he gets.

Once out of ammunition I had to stay with the wretched tank until the aliens tracked me down.

In desperation I headed for the nearest crevasse.

In short, hardly a classic. But if driving "a tank so powerful that even heavily armored aliens look like dead meat in her gunsights" appeals to you, go for it.

Articfox will sell on its name alone. And it's going to disappoint a lot of people.

W.F. Wilberforce

Product: Decision in the Desert
Price: £24.95
Supplier: Microprose, 2 Market Place, Tetbury, Gloucestershire.
Tel: 0666 54326
Requirements: Any Apple II

MONTY never had it so good, and Rommel certainly didn't. Perfect communications with all units in the field, unflinching obedience in the face of the stupidest orders and a continuously updated overview of the whole campaign.

The latest offering from Microprose gives all this and more as it shrinks the war in the desert to manageable screen proportions.

Veteran board wargamers will recognise the format from table top battles. The game is played out on a map of northern Africa, superimposed on an invisible hexagonal grid which is essential to regulate movement, combat and supply.

Units are represented, down to brigade level, by either icons or symbols. The former make it easy to see at a glance what the state of play is, while the symbols lend a more professional flavour.

Whichever you choose – and you can toggle between the two anyway – has to be an improvement over the unwieldy stacks of counters used in board games. And the days of the hoover decimating entire armies have gone for ever.

Graphics are simple but well executed and the screen scrolls neatly enough in any direction, within the bounds of a scenario, effectively giving you a window on to the larger map.

A freeze option, available at any time, lets you rove around and size up your human – or computer – opponents before committing yourself to action.

The manual is well produced and generally helpful, featuring playing hints and historical notes in addition to the usual "how to get started" section.

The commands could have been explained more clearly, but careful reading, cross reference – and trial and error – eventually pay off. And there's a useful command summary insert at the centre of the manual to save constant wading through the pages.

Five scenarios are offered, all with permutations. And as the program allows you to command either side, and can adjust the level of your opponent's skill, the possibilities are almost endless.

A short introductory game, Sidi Barrani, allows you to be blooded gently – bloodied in my case. Don't be tempted to plunge in at the deep end with Alamein.

Fighting through this, a straightforward and self contained campaign, will give you practice in handling your units and finding their limitations.

You'll find, for example, that different units have different rates of movement, that terrain is a real factor – and supply is all important. Gamers used to full throttle, unlimited ammunition shoot-em-ups will be in for some unpleasant surprises.

Each campaign is fought within a given time span, though you can select the speed of play and a save game facility will spare you sleepless nights.

And each scenario carries its own victory conditions, generally in terms of strategic centres captured.

Your units can move, attack, defend or move into reserve to recover at your joystick orders, which remain in force until carried out, or until enemy action intervenes.

At your disposal you have armour, infantry, artillery and aircraft, though the RAF has a tendency to choose its own targets unless you keep a close eye on things.

Moving the cursor over a unit and pressing the fire button will reveal a unit's current orders, strength and status and another press will give you a menu to change the orders.

Be warned – local commanders have an unnerving habit of assuming control, and their objectives when ordered to attack are not always what you had in mind.

The process has to be repeated for each unit and things can get quite hectic in the larger campaigns. If your unit is adjacent to an enemy, pressing the fire button will reveal his strength.

Don't make the mistake of assuming all icons are equal, as some are more equal than others. I discovered this when I cheerfully unleashed 1,000 cooks and bottle washers on an entrenched panzer division.

As units take casualties their effectiveness drops, sometimes to the point of no return. Likewise, paying too little attention to supply lines will see you trying to move without petrol and fight without ammunition.

Be sure to keep an eye on the top five lines of the screen. Here you'll see messages coming in from units – "Out of supply"; "Meeting heavy resistance" and, memorably from the minefield, "Must surrender".

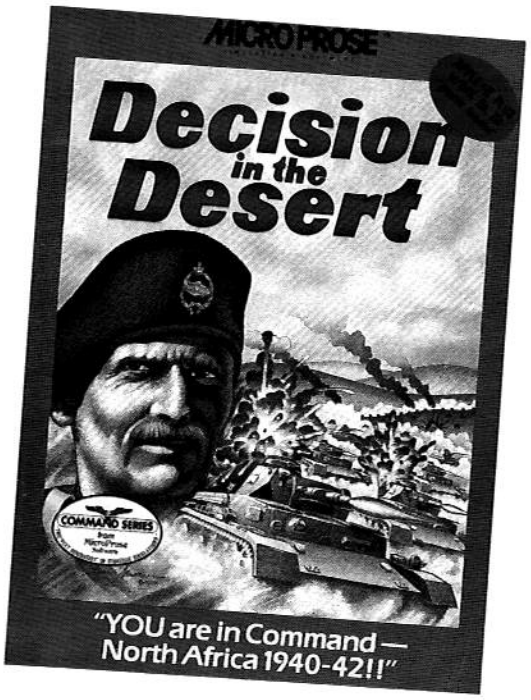
It is quite possible to lead a charge of the Light Brigade, but not advisable. Careful probing, followed by concentrated attacks on weak spots, is the way to amass victory points.

And don't put your HQ in the line of fire. "Follow me I'm right behind you" is the tack to take, even if they don't teach it at Sandhurst.

Very few niggles really, considering what the game can do. The main one is that outflanking manoeuvres can lead to disaster – the program's a little erratic in deciding what constitutes being out of supplies.

In similar vein, I couldn't find a way to cut the opposition's supply lines, or get my own units back into the paths of righteousness – they would insist on retreating away from friends.

The computer's concept of "Limited intelligence" takes some getting used to as well. It translates into hiding enemy units at random, which can be a little disconcerting when the odd tank regiment suddenly appears in your rear.



. . . to an action replay of the El Alamein battle

There were some surprises too in the calibre attributed to the forces involved. Old jokes aside, the Italians weren't that good – and the South Africans were a lot better. And a final niggle, aimed at the cover picture – didn't Monty run to two badges on his beret?

These minor points aside, Decision in the Desert is enjoyable, fast moving and frustrating enough to keep you coming back for more. Certainly Rommel would have enjoyed the action replay feature.

A nice touch is the end of game display which awards you a rank according to your performance. You can aspire to the dizzy heights of Supreme Commander – I'll be happy if I get beyond acting blank file.

W.F. Wilberforce ▷

Product: The Toy Shop
Price: £49.95 (64k Apple II) £54.99 (128k Macintosh)
Supplier: MGA Microsystems, 140 High Street, Tenterden, Kent TN30 6HT.
Tel: 05806 4278

Micro model making provides hours of fun

A NEW type of book has recently appeared in the stores. Consisting of a few pages printed on thin card, the object is to cut up the pages and make anything, from mathematical solids and structures to gift boxes and Roman forts.

I must admit that these are rather tempting and I have bought quite a few, but I hardly ever make the models. This is due to the fear of getting it wrong coupled with a reluctance to cut up books, irrespective of the fact that they were designed for that purpose.

Now to the rescue comes The Toy Shop, available for several computers, but my experience is confined to the Macintosh version.

It is a three disc set enabling you to make 20 different models. In addition, consumable materials are included – a wooden dowel, wire rod, rubber bands, string and balloons – making it quite a weighty package.

The basic idea is that the template for a model is printed out on ordinary paper. It is then transferred to thin card stock that has one side covered with a self-adhesive coating. You cut up the card and fold, glue and shape it into the final model.

When you run the software the master disc asks you to insert the other discs in turn and then presents you with a menu of models to choose from.

These include static models of antique cars, trucks and planes as well as working models of scales, cranes and a carousel. There are also flying models, balloon-powered dragsters, a sun dial and a zoetrope.

The 207 page manual describes general constructional techniques as well as those pertaining to individual models. The models are well thought out and each one is placed in one of three grades: Easy, medium or challenging. Note that they are not admitting that any are difficult!

When you have selected a model to make you have an opportunity to customise its decoration. Certain areas of the model can have patterns of the standard Macpaint variety assigned to them, text can be replaced and finally you have a choice of decals.

There is also a mini Macpaint enabling you to edit the existing decals or design your own.

I found it was best to use light patterns as heavy ones tended to mask some text and model details. You can save the customised model to disc for later use.

When printing out the result of your customising you will get from one to five pages depending upon the model, most which will need to be stuck on to the card.

I made several models, the most ambitious being a zoetrope – a Victorian invention used to show a sequence of moving pictures.

It consists of a rotating drum with slots down the side. The drum is loaded with one of two supplied picture sequence strips and placed under a bright light. Then by spinning the drum and peering through the slots you can see a 12 frame moving picture.

It will never replace the TV but is fascinating to watch nevertheless. Also those of you with a small amount of artistic skill can make your own strips with Macpaint.

The only weak point in the construction method is where a dowel has to be attached to a piece of card. This is achieved by pushing the dowel through a tight hole and then surrounding the join with super glue. I sometimes found the strength in this arrangement lacking.

Another problem with some of the models was the requirement to use a one cent piece as a balance. Substituting the English 1p sometimes meant I had to adjust its position on the model.

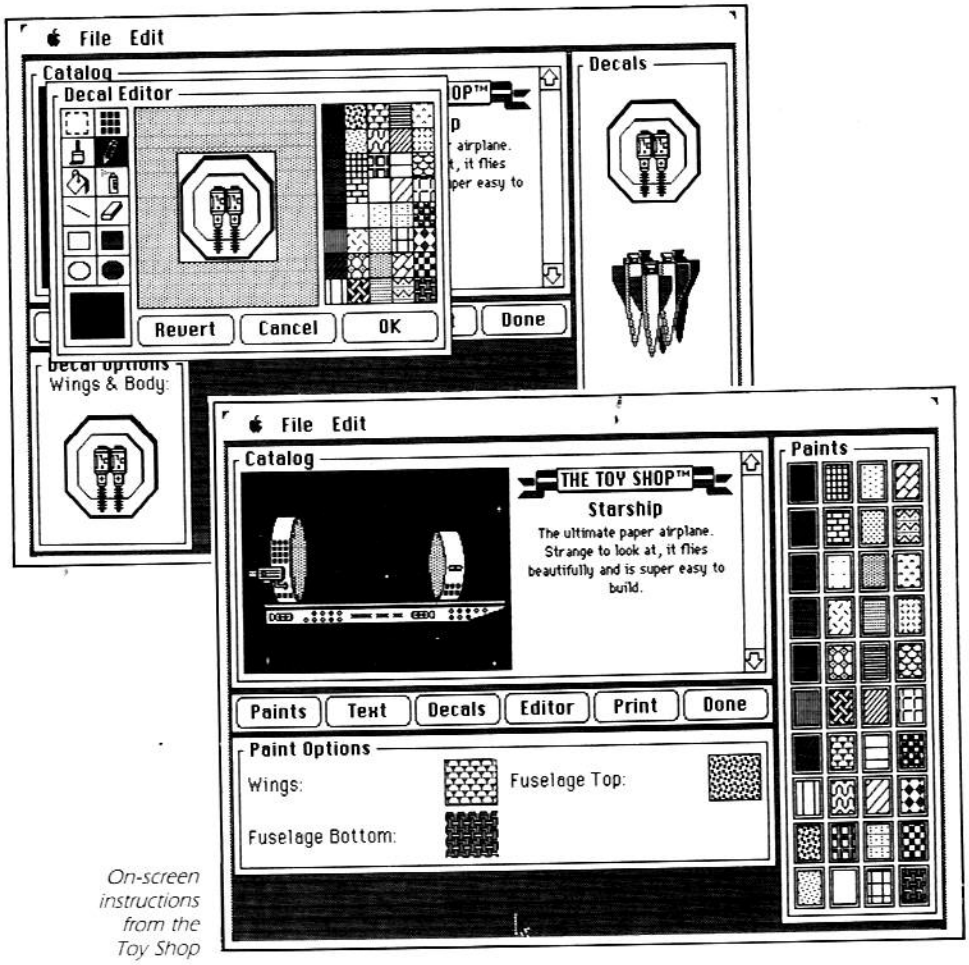
However, on the whole I found the models I made were successfully constructed without too much difficulty and the instructions were relatively easy to follow. If you make a mess of one part of the model you need only print out the appropriate page again.

As to the consumable items in The Toy Shop, these can easily be replaced. The publishers supply a replacement pack or you can buy the individual parts at most model shops.

You could use any type of card stock if you bought a can of aerosol glue and then continue to make models for as long as you have the time and inclination. This would be ideal in a class situation as each member could make his own customised model.

Overall Toy Shop is an excellent package that will appeal to a wide range of individuals and keep them entertained for many a month.

Mike Cook



On-screen instructions from the Toy Shop

Expanding your graphics horizons

Product: Graphics Expander Volume 1
Price: £34.99
Supplier: Springboard Software, c/o MGA Microsystems, 140 High Street, Tenterden, Kent TN30 6HT.
Tel: 05806 4278
Requirements: Apple II with 64k and Broderbund's Print Shop

I ALWAYS think of Broderbund's Print Shop and Springboard's Newsroom as going together. I even keep the two programs and all their associated data discs in a box of their own.

Springboard's Graphics Expander Volume 1 fits nicely into my conceptual system because it provides Newsroom-type graphic facilities for owners of Print Shop.

I haven't seen any volumes other than this, so I don't know whether Springboard plans to expand Print Shop in other directions or expand it graphically even further.

You start with the Expander disc, load a picture into the work area, modify it to your heart's content then save it to a data disc for use with Print Shop. I'll describe each of the stages of this process before briefly comparing Expander with Broderbund's own Print Shop Companion.

Booting the Expander takes you into the work area, a familiar sight for Newsroom owners, with a blank square occupying most of the screen and a series of icons down the left-hand side.

Selecting the appropriate icon allows you to flip the graphics from left to right, magnify a portion for fine work (like the Mac's Fatbits), trash the entire work area or undo the last action.

The crayon icon opens up a Graphics Tools Window through which you can choose to draw straight lines, circles, boxes or freehand with a variety of pen sizes and shapes. This window also contains the available fill patterns and fonts, an eraser, and a hand to allow repositioning of the graphic within the work area.

You could use these tools to create a drawing from scratch with a fair bit of effort, but the emphasis of the package is on using them to alter existing drawings.

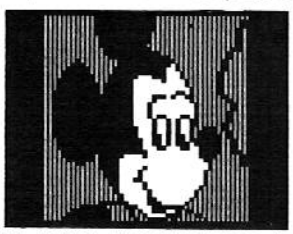
You load a picture into the work area from one of three sources. The flip side of the Expander disc is full of clip art which will also be familiar to Newsroom owners.

However, the disc format is not compatible with the Newsroom format so you can't interchange them. You can't even use them directly from Print Shop – they must be loaded into Expander first and then saved for later use.

The second source of pictures is the Print Shop disc itself or one of its Graphics Library discs. Of course, you've always been able to modify these pictures using the Graphic Editor but that was fairly tedious since it only really allowed a pixel-sized cursor to be moved and the corresponding dot to be drawn or erased.

Finally the Expander allows you to make use of standard hi-res pictures. Great, I thought, I'll use a hi-res digitised picture of myself to create a really customised letterhead.

Unfortunately (although the people I write letters to may disagree with this judgment), the Expander only allows you to select a portion of a hi-res picture – less than a quarter in fact – and my head wouldn't fit in!



A famous mouse, borrowed from his space adventure, gets converted for use with Print Shop

In principle, you could use an interrupt device like the Snapshot card to freeze an adventure game, dump the screen and then borrow a section of the picture to incorporate in your print work. Presumably this is the electronic equivalent of art theft.

It's possible to combine an Expander graphic with a Print Shop graphic or a hi-res portion. However, loading either of these last two clears the work area so it's necessary to load them first. The destructive load means that you can't mix bits from all three sources.

Once you've finished fiddling with the graphic, you save it to a data disc. No matter what the source was, it is saved as a Print Shop graphic and can then be used with that package.

If you want to use the Expander to modify it further at a later date, it must be loaded using the Print Shop Graphic rather than the Expander option.

As the title suggest then, this package offers a way of expanding the graphics capabilities of Print Shop. It gives over 300 pieces of clip art and also allows use of Broderbund's own Print Shop graphics and sections of hi-res screens.

It works well and does everything it sets out to do, so how does it compare with Broderbund's own extension product, the Print Shop Companion?

The Companion contains a Graphic Editor+ which looks superficially like the old version but in fact contains a whole host of added features including the ability to choose a portion of a hi-res screen. However, it also allows you to edit the Print Shop fonts and borders as well as having a few other facilities.

I won't dwell on the Companion – suffice to say that if you've already got it you wouldn't really need the Expander as well.

Having said that, though, if your main interest is graphics and you're happy with the Print Shop borders and fonts, you'll find the Expander easier to use on the whole.

Springboard is obviously trying to lure Broderbund's customers towards its own products because if you press D while the Expander is booting you get a demo of Newsroom.

As if that's not enough, included in the Expander box (the usual excellent Springboard sturdy plastic case) are two demo discs. One is devoted to yet another Newsroom demo and the other covers Rainbow Painter and Easy As ABC. Once you've seen the demos, these provide a bonus couple of spare discs.

Print Shop is a classic program and one which gets a fair amount of use by adults and children alike in our household. Coming as I do from a great family of card-senders, it has allowed me to keep up with the rest of the clan without breaking the bank.

Anything which extends Print Shop is potentially useful and the Graphics Expander extends what was probably its weakest area. It's also very easy to use.

You could probably produce similar results using Henry Kong's programs (*Apple User*, September 1986) and Paul Sinnett's powerful editor (*Apple User*, July and August 1986), but if your time is valuable or you don't like entering and debugging listings you're better off with Graphics Expander.

Cliff McKnight □

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Access

Form making with MacPaint

Duncan Langford shows how simple forms can be constructed using a Mac and MacPaint

SOME time ago I wrote in *Apple User* of ways in which MacPaint could be used to prepare flowcharts, using as an example making the coffee. In fact Steve hasn't yet forgiven me for showing exactly how it could be done.

I have since been told that Mac flowcharting has been found useful in a surprisingly wide range of activities, and I have been asked several times about other ways in which MacPaint could be used in business.

Commercial programs are now available which allow the Mac to do virtually anything a computer can do; but they all have in common a depressing fact – Mac programs are expensive.

Whereas those otherwise unfortunate people with Apples are able to buy business packages from around £40 upwards, Mac software costs from double to ten times that price. And dealers, as a rule, are cautious about allowing you to take a package back to the office for a week or two to confirm that it will actually do all that they told you it could.

MacPaint comes free so, before buying a new graphics program it may be worth experimenting with this. The program may be free, but it's also very well written, and it is very flexible indeed. I have even seen it used as a word processor, when a larger type than the 24 point allowed by MacWrite was needed, although even as a MacPaint enthusiast I wouldn't go so far as to recommend that you write your next novel with it.

Most businesses use forms, and virtually all businesses could probably make effective use of them were they not hard to design and very expensive to print. As a natural consequence, they are frequently hard to update or modify.

Economies of scale where printing is concerned may result in large quantities of forms being printed, and using up stocks of out-of-date forms can be a pain at best.

In this article I hope to explain briefly a little of form design, and to show how simple forms may be constructed using only the Macintosh and MacPaint.

Form design is straightforward using MacPaint. Results are immediately visible, and modification is easy. Print quality, using a photocopied Imagewriter printout, is quite acceptable, particularly if a new ribbon is used, and the LaserWriter (you don't need to buy one – look for "Print your work on our LaserWriter" advertisements) allows virtually typeset results.

Before actually starting to design your form, there are a few points worth keeping in mind:

- Is the form necessary? However much fun designing a form on the Mac may be, it's best to make sure it's actually needed – and there are many forms which aren't.
- Will it be used? However good your form may be, however useful it potentially is, if people won't or can't use it, your efforts are better used elsewhere. Think hard about what is likely to happen, if a new form is produced, before producing one!
- Is the form economically worthwhile? How long will it take to design, to print, to distribute? How much will it cost? Will economies resulting from its use make these costs worthwhile?

Inform

When you are sure that it's appropriate, the next step is to work out exactly what you want the form to do. In general, forms are intended to gather together information which is to be processed.

It is worth remembering that those who complete forms are usually likely to know less of the subject than those who process the information. So make sure that your form is not too complicated, or contains jargon which might not be understood.

The best forms will make accurate completion straightforward, the response and answers required being obvious. As an illustration, consider actually collecting forms – not necessarily on the subject of your particular interest – which you feel are effective, and study them.

Do they have anything in common? Particularly if they are similar in style to your own form, are there any useful tips you can borrow? It can, of course, be useful to study bad forms, as well; they may have much in common, too.

If you're redesigning an existing form, start by looking very carefully at the original. Without changing it for change's sake, exactly how could it be improved? Would you experience any particular problems in filling it in?

In any event, if you are not directly in touch with the form's potential end users, consider trying a little survey to find out what they think – it may not coincide with your own views.

Your own studies will mean more to you than any rules I may lay down, but you'll probably find that good forms:

- ☐ Won't try to request too much information.
- ☐ Won't attempt to cover too many different options.
- ☐ Will follow a logical "flow".

In addition, the use of too many different type styles or a cluttered layout is to be avoided; a uniform approach will make the form easier to read, as well as easier to complete.

When you have decided roughly what information your form is to request, write down in draft two lists; they are both of equal importance.

The first is a list of the questions the form is to contain and the second, a list of the information the form is to provide.

Think carefully about your lists, making certain that for each question on the form you have either provided information, or you are sure that the answer required really is obvious, otherwise the reply you get may not be the one you had anticipated – see Figure I.

Name: ***John Smith*** Age: ***21***
Sex: ***interested***

Figure I: The unexpected answer

If it is important that information is entered in a particular format, make sure that you haven't allowed for unwanted alternatives. For example:

(4) Date: ..... ▷

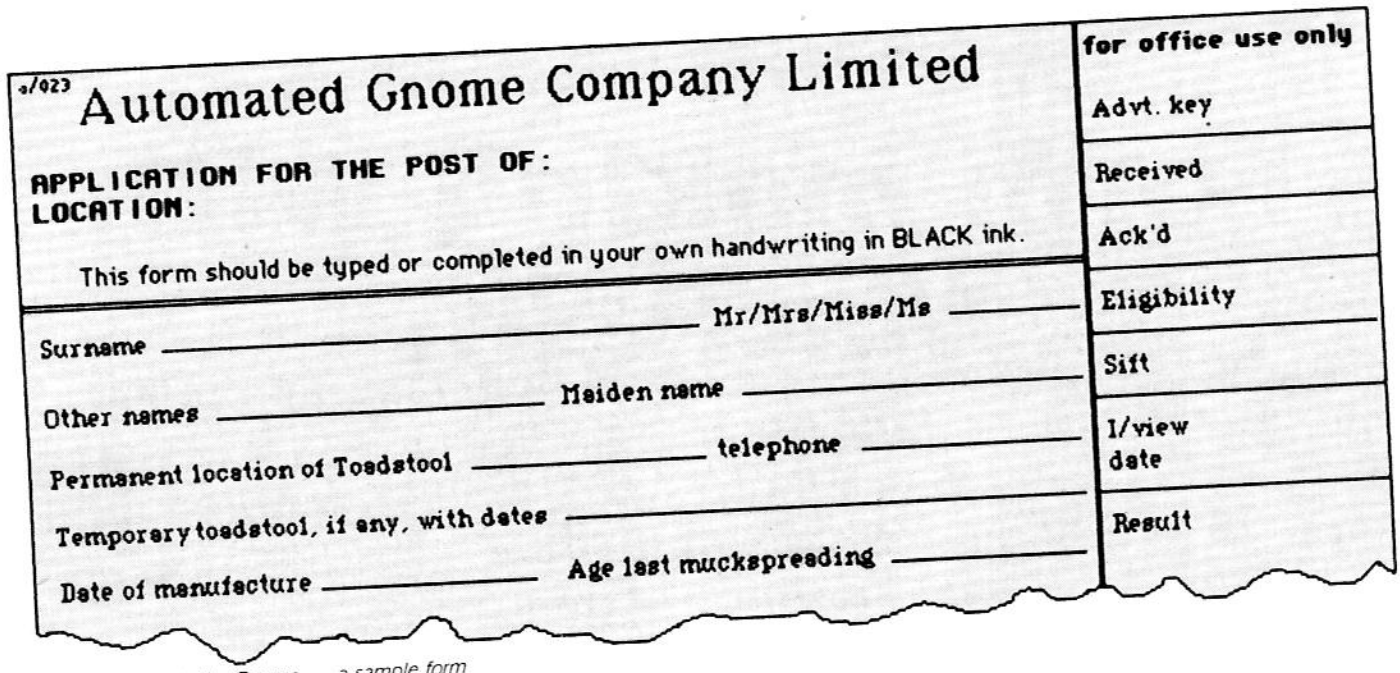


Figure II: No job like Gnome . . . a sample form

could be completed in several different ways, while

(4) DATE day: (1-31)....
month: (Jan-Dec)....
year: 19....

is less likely to be misunderstood.

Let's assume that we're involved with the prestigious Automated Gnome Company, and that we want to tighten up on the issuing of new gnomes from our stores. Several departments collect the gnomes, and it will be useful for our purposes to identify both the department needing a gnome, and various details about the gnome itself. Our first list may well look something like this:

Automated Gnome Co. – stores issue information

1. Heading
2. Department
3. Date
4. Authorisation code
5. Height (as of course all personnel visiting the stores must be less than 1.25m tall)
6. Part number
7. Beard length
8. Colour of hat
9. Whether fishing or not
10. Motive power–steam, clockwork or fusion power.

– and so on.

If we settle down in front of Automated Gnome's Macintosh without further thought, we may well produce a form which looks something like that in Figure III. Superficially it may not look too bad; all the information we need is requested, and we've even altered type styles to set off various parts of the form. Note, for example, the tiny DUD/1 form number in the top right, and the large Automated Gnome heading.

Poor form

Despite these points, though, it's really not a very good form. To start with, although it has a heading, nothing actually tells us what it's for. We may know that it's intended to be a stores form, but would anyone else?

And, even assuming that it finds its way into the right hands, what about the information we're seeking – is the form really all that clear?

Anyone who has been faced with the task of collating information will tell you that often the hardest part is actually going through data, putting it into a common format. Analysis of average heights, for example, first needs the heights to be expressed in the same units, and our form just asks for Height, without any indication in which unit (feet? inches? metres?) we would like the answer expressed.

Figure IV contains the same information, but this time indicating the form in which answers are expected. It simplifies matters, too, when there are only two or three possible answers to a question by providing boxes to tick. This not only makes completion of the form faster, it also makes certain that answers will lie within acceptable limits.

By now you should have a fair idea of what to put into your form; you'll have lists of questions, lists of information to be provided, and some ideas on how to put them together.

Before sitting at your Mac, draw your proposed form roughly on a large sheet of paper. Don't worry about neatness, concentrate on getting the layout about right. Keep working at this until you are reasonably sure how the form will fit together.

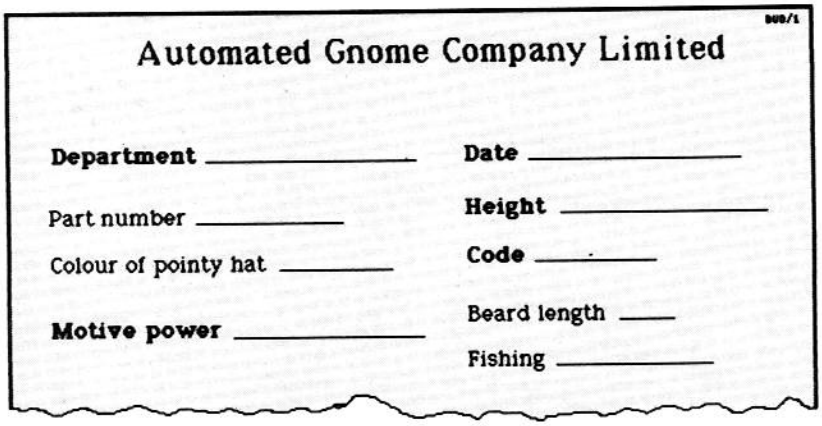
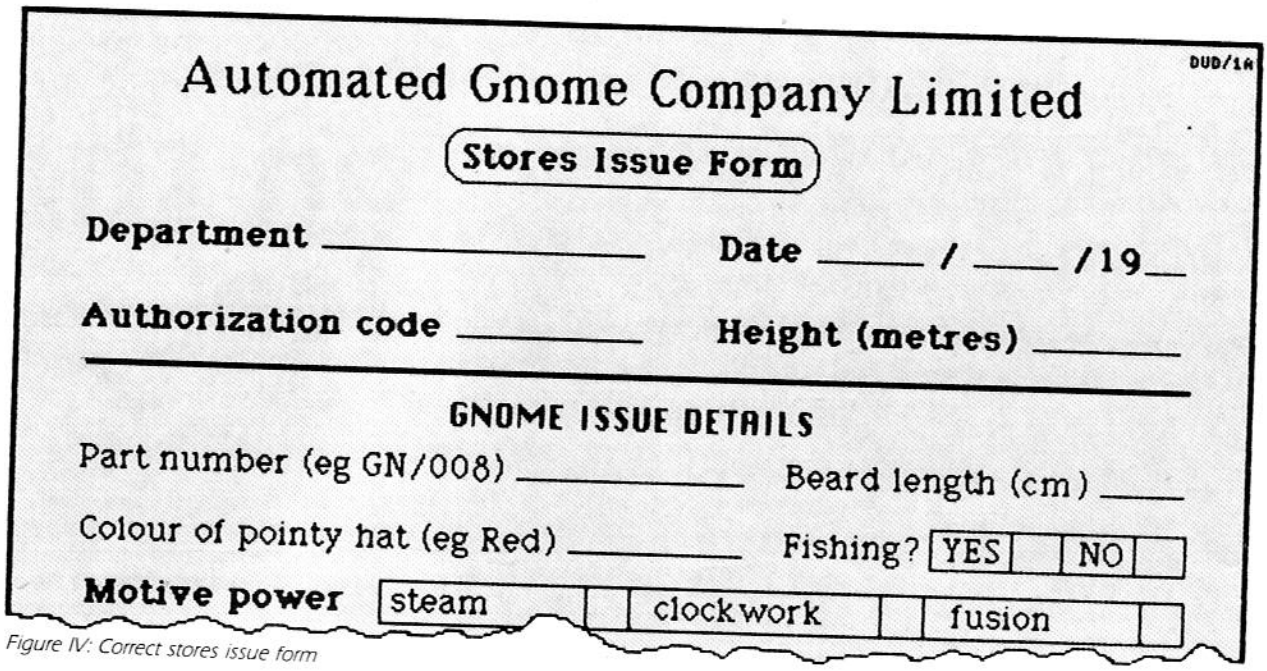


Figure III: Incorrect stores issue form

Form room

If your paper becomes too crowded, it's a good bet that you're trying to get too much into your form, so try a new sheet. It's usually better to have two forms that are clear, or a double sided form, rather than an overcrowded single sheet.

Next, make up a disc containing MacPaint, Finder and a System file with a wide range of fonts. You're unlikely to need Cairo



DUD/1A

Automated Gnome Company Limited

Stores Issue Form

Department _____ Date ____ / ____ /19__

Authorization code _____ Height (metres) _____

GNOME ISSUE DETAILS

Part number (eg GN/008) _____ Beard length (cm) ____

Colour of pointy hat (eg Red) _____ Fishing? YES NO

Motive power steam clockwork fusion

Figure IV: Correct stores issue form

or Venice, but New York in 9 to 36 point could be useful. So could a very small font and various specialist fonts, depending of course upon your area of particular interest. An ImageWriter file isn't necessary, by the way – MacPaint doesn't use it.

If you wish to include MacPaint drawings, perhaps from a clip-art disc, probably the simplest way is to save them to the Scrapbook on the original disc, then move a copy of the Scrapbook to your special disc.

Start off with Show Page to centre the screen at the top of your sheet, then back to the main screen to type in your heading, and you're away.

Don't attempt to line everything up as you type it in; the lasso is ideal for moving text around, and it's really unnecessary to make perfect alignment before using it (see Figure V).

To match old text to new, for example to add "(eg GN/008)" to "Part number", find a clear space on the screen and type "er eg GN/008". Lasso this text, and move it up until the opening "er" overlays the last two letters of "number".

You will find that the bold character effect vanishes when the text is correctly overlaid, and the new text will follow the old perfectly. Figure VI illustrates this point.

Remember, also, to allow sufficient room after your text for the person completing the form to write in a reply.

Use the Box option freely. It is, of course particularly useful for Yes/No boxes. For example in Figure IV the Yes/No box is actually made up of four overlaid boxes. It took only about 10 seconds to draw.

FatBits is invaluable for tidying up the odd misplaced pixel, but I have also found that very accurate alignment is possible using the lasso within Fatbits to move characters around. It's worth getting into the habit of checking from time to time both with Fatbits and Show Page, to gain a macro and micro view of your growing work.

Try using emphasis in various places, both to bring attention to important points and to make the form visually more interesting. Emphasis can be made in several ways – bold type, larger type, a different font, boxes, underlining, or combinations of these.

Uniform

Be careful, though, not to fall into the new Mac owner's trap by producing a form so full of different type sizes, fonts and styles that it gives the reader a headache.

Although frequent use of Show Page helps, nothing is really as good as printing a draft quality copy from time to time, and after studying it, don't be afraid to re-jig the layout, even at a fairly late stage. The ability to do this is one of the reasons you're using a Mac.

Finally, don't forget to regularly save your work; it only needs one person to trip over your power cord.

When the form is finished run off a copy (overprinted DRAFT), and study it very carefully. I've found that it's usually better to wait overnight before doing this. Somehow even obvious errors are more difficult to spot after sitting too long at the Mac.

When the form looks good to you, photocopy it and circulate it with an attached note to find out what it looks like to others and to those who will be using it. Try getting a few copies filled in by people unfamiliar with the form – do they make any form-induced errors?

When this last stage is over, and any necessary corrections made, put in the best ribbon and print a final copy. And do take care. As luck would have it, when I had reached this stage myself with the Automated Gnome employment form, I accidentally spilled a mug of coffee all over it. Come back, Steve. □

1. Type text	Stores Issue Form
2. draw oval	Stores Issue Form
3. lasso text, & centre it	Stores Issue Form

Figure V: How to put text in a box

1. Original text	Part number
2. Text to be added -note the leading 'er'	er (eg GN/008)
3. Lasso new text	Part number er (eg GN/008)
4. Move it closer...	Part number (eg GN/008)
5. Perfectly aligned!	Part number (eg GN/008)

Figure VI: How to align text exactly

Adventuring on the roof of Africa

A team of Apple UK employees led by managing director David Hancock recently scaled Tanzania's Mount Kilimanjaro. Sonja Garsvo recalls the experience.

Saturday lunchtime

Excited and nervous hordes gather at Heathrow's Terminal 4 to begin the adventure – seven men and seven women, the Apple management team and our other halves. There is a lot of trepidation about what the trip holds in store. Disbelieving relatives say goodbye.

Sunday

We arrive at 6am after a sleepless night on board our KLM flight. We crane out of the windows for a first view of hot sunny Africa – and it's raining, heavily! Clearing the torturous entry routine at Kilimanjaro airport we meet M'Bu our guide for the trip. We climb wearily into mini coaches and off we go.

The two-hour trip is fascinating as we see incredible countryside with distant horizons and mountain peaks. We arrive at the Marangu Hotel in Moshi, some two hours later (no star rating – lizards in every room and a tarantula in the toilet).

Late afternoon we awake and see Kilimanjaro for the first time – awe inspiring and very far away.

Monday

Off we set, clean, well fed, enthusiastic – so far so good. We arrive at the Marangu National Park where we sign the register and read ominous warnings about altitude sickness and pulmonary oedema . . . Hmm. The sun's shining and we're really off – walking through the rain forest to 9,000 feet. The air is starting to get thin and we puff and pant as we put our best (collective) foot forward.

Arriving some six hours later at the first huts we look firstly with pleasure at the splendid views and secondly in dismay at the insanitary conditions and communal sleeping arrangements. No lighting or heating, food consists of soup, millet porridge and unidentifiable flat meat. It rains heavily.

Tuesday

After a wet, cold, uncomfortable night we start the next long haul – still through rain forest (by now very muddy). Oh yes, lots of mosquitoes (did I take my malaria tablets?).

We walk 12 plus miles through rain forest and wonderful savannah. Uphill all the way, altitude really getting to us. Arrive at Horombo hut at 12,500 feet. Sanitary conditions even worse, sleeping arrangements similar.

Sophisticated ladies attempting to wash in freezing cold mountain streams, sophisticated men refusing to do so. Altitude sickness begins to take its toll, with bad headaches, nausea, diahorrea, breathlessness.

Sang happy birthday to David Hancock. Celebrated with Kendal mint cake.

Food? What food!

One person suffering very badly from altitude and sun sickness – bravely returned on her own 18 miles to hotel, to allow her husband to continue.

Another bad night with little sleep.

Wednesday

Acclimatisation day. We stay at Horombo hut. Practice four hour walk up increasing altitude to 14,000 feet. Spot 12 foot high giant groundsels marching like triffids across the bleak landscape.

Animal skull passed on route has sign saying Last Water. We clutch our back packs in reassurance that our water flasks are full. Very tired crew retire for the night at about 7.30pm as usual – again no light, heat and another bad night for us all.

Thursday

Absolute hell!

Walked about 12 miles across blizzard-swept desert. We are exhausted, cold and Kilimanjaro looms ominously over us on the horizon like the Sword of Damocles. Soaked to the skin, we alternately bake in the high altitude sun and are chilled by the rain. The air is incredibly thin by now and we trudge onwards over bleak and desolate landscapes with only the odd outcrop of rock as landmarks.

We arrive at Kibo hut. It's cold, inhospitable, and stinks!

Again we are in communal accommodation – we struggle into full arctic clothing and lie on our wooden bunks for five hours rest. Real nerves have set in now.

At 12.15am we rise in the eerie darkness and leave Kibo hut for the final assault. A long line of thirteen tired people follows the small glow from a storm lantern as we march out into the unknown in the face of a freezing blizzard.

Many people are nauseous. Each step is painful and you have to rest every 20 paces. We are aiming initially for the cave where we are told we can rest. We arrive some four hours later. The cave is merely an outcrop of rock where we slump in exhaustion.

"How much further?" somebody asks.

Stoke Mandeville Hospital to benefit

As well as symbolising the effort the climbers are contributing daily to Apple UK's continuing success, the assault on Kilimanjaro also raised money for the National Spinal Injuries Centre, Stoke Mandeville Hospital. Thanks to the generosity of sponsors, and Apple UK itself, the Centre is now better off by one Macintosh Plus and about £2,000.

The answer comes: "We're halfway!"

Off we set again, without one of our other halves – a chronic asthmatic she has made it to 17,000 feet and has given up due to altitude sickness.

Friday

Dawn breaks and the team spirit and the strong partnerships have really come out now, everybody is encouraging and supportive. Wives rally their husbands on, on a journey that is indescribable effort and pain. People collapse in the snow wondering if they'll ever rise again.

The blizzard continues and ice forms all over everybody – thank you whoever invented balaclavas.

At last the peak is in our view. Another two hours says the guide. Will we ever make it?

On wobbly legs the first part of the Apple team reaches the 19,455 ft summit. Hugh Nicklin, Sonja Garsvo and Peter Cossins with respective partners collapse in exhaustion at the top to be greeted by the most wonderful views from the roof of Africa.

David Hancock, John Floisand, Harold Beirne and Bob Taylor arrive with their partners and display the Apple Flag alongside the flag of Ireland and the Union Jack.

Back down we go. Now under an intensively hot sun – yes still in full arctic gear.

Hugh Nicklin, our marathon runner, sets off on a 30 mile jog to meet his ill wife back at the Marangu Hotel. The rest of us are half dead with exhaustion.

Back at Kibo hut, we rest for about an hour and set off again down to Horombo. We have become walking machines.

We sleep despite the conditions.

Saturday

The last leg of the journey. Approximately 23 miles back to the entrance of the Marangu National Park. Our hands and feet tingle with the effect of coming down from high altitude. Yes, it rains again – we get wet, dry off, get wet again. There is an intense feeling of satisfaction as we realise we've done it.

We almost run down off the mountain.

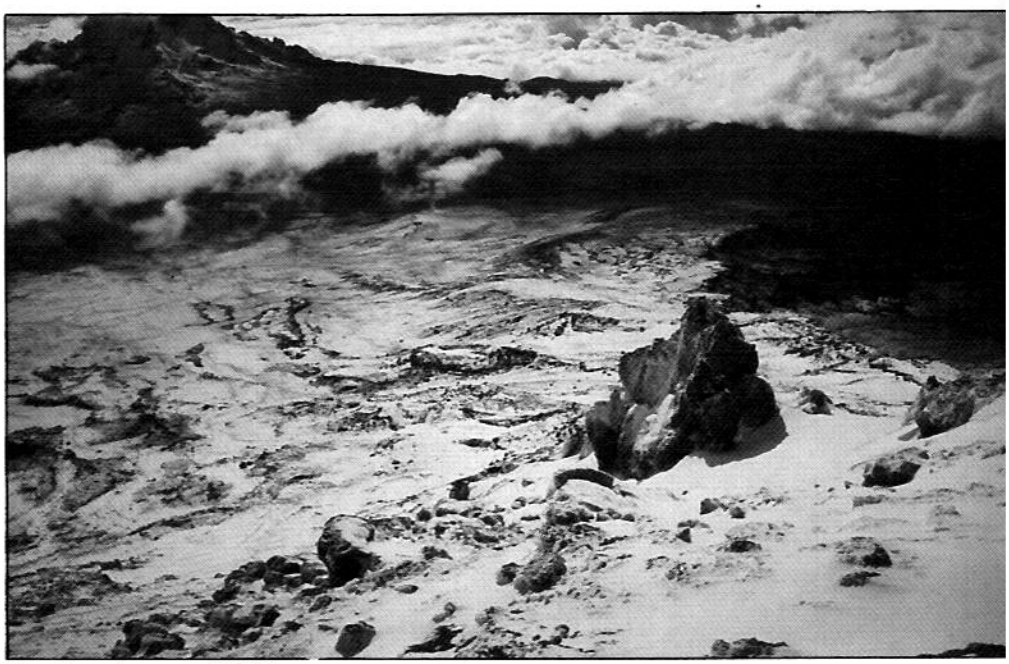
Sunday am

We get up at 4am to catch our plane. Sonja Garsvo has happy birthday sung to her. We celebrate.

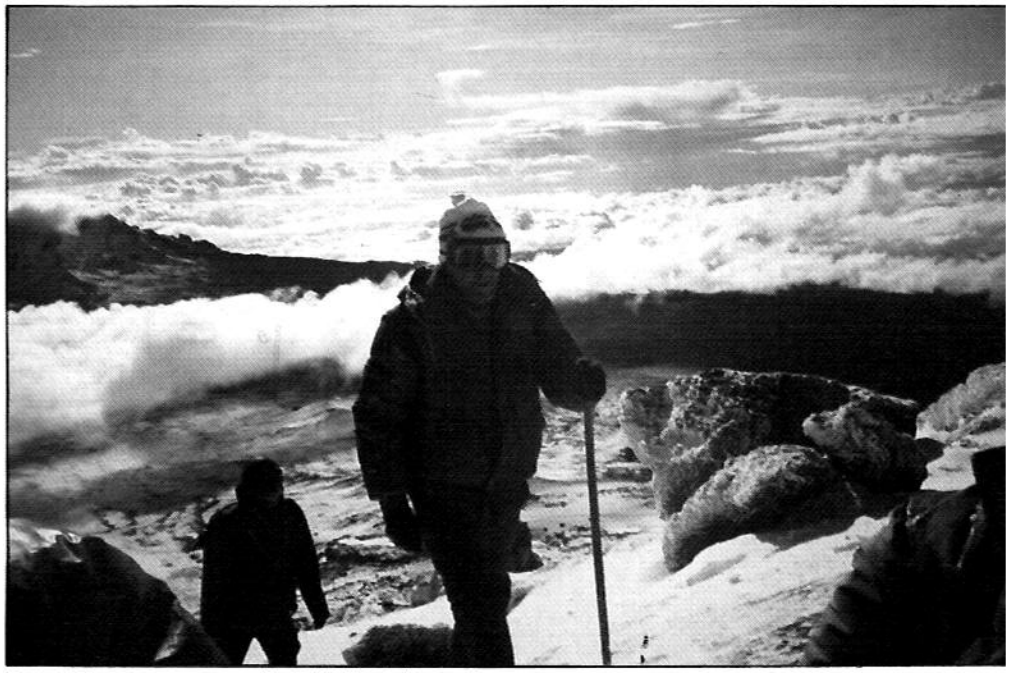
Sunday pm

We arrive back at Heathrow, Terminal 4 most of Apple UK are there to greet us.

What a fantastic adventure!



View from the top at 19,455 ft.



Technical services manager Hugh Nicklin is first to the top

Peter Cossins, director of operations and human resources, on the last lap □

The strength of the pas

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Apple, The Apple Logo, Macintosh

, the power of the future.

There are three million Apple II users around the world.

Businesses. Freelancers and entrepreneurs. Teachers and pupils. Artists and scientists.

Individuals who use their computers in three million different ways – which says a great deal about the Apple II's versatility, staying power, and ingeniously flexible design.

So when we set out to create a new generation of Apple II, we knew that we were building on a hugely successful heritage. All we then had to do was use the newest technology to make it fast, powerful, communicative and colourful. As well as compatible with the enormous range of existing software and hardware, and as flexible as ever.

Welcome to the Apple IIGS.™

First, meet the 65C816 microprocessor. It has 16-bit performance, making light work of powerful new software, yet it can run virtually every program in the existing Apple II library – up to three times faster.

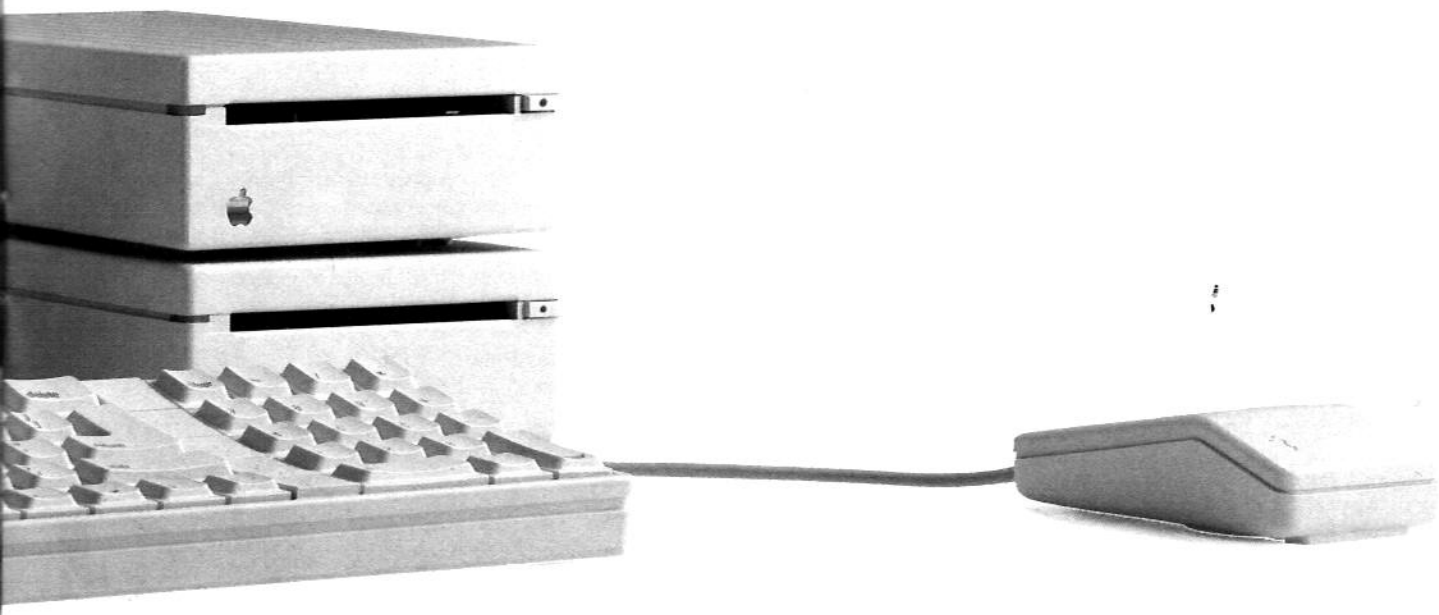
It does this by working with another chip, the most surprising one of them all. The Mega II; the Apple II on a chip! This tiny device has the functionality of the Apple II family crystallised into one square inch, which leaves a lot of room for new features.

Take a look at the outstanding graphics combined with 4096 colours of stunning intensity, from electric red to the most delicate violet.

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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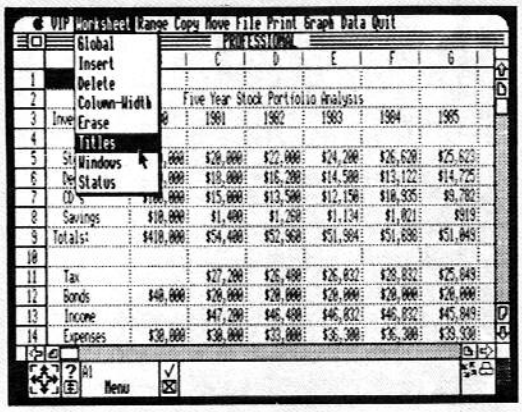
"Amazing as it may sound, VIP Technologies has managed to copy 1-2-3, add a Mac interface, and transport the whole thing to the Apple II"

Editor's Choice Award
inCider Magazine



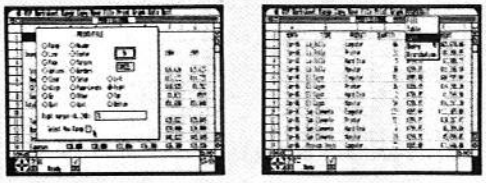
VIP Professional is the finest piece of software ever written for the enhanced Apple IIe and IIc, and the most powerful, highest performance and easiest to use spreadsheet ever. VIP Professional combines a spreadsheet with power to handle the toughest number-crunching problems quickly, database functions to organise your information, and high-quality double hi-res business graphics to express your numbers with beauty and finesse.

1. Spreadsheet. Nothing is left out of this giant 256 column by 8192 row spreadsheet, You get variable column width, split screens, frozen titles, sorting, file combine and extract, copy, move, range naming, local and global cell protection, total printer control, and over 50 special functions to make worksheet creation a snap. And VIP Professional supports up to 4 megabytes of memory – for when you need real power.

Lotus 1-2-3 Made Easy VIP Professional was modelled after the powerful, best selling Lotus 1-2-3. It not only has the same commands and features, you can also type the same keys to do the same things. It can also read and write Lotus .WKS files and run all Lotus macros. So you have immediate access to thousands of Lotus templates, worksheet models and macro applications and can share data with the rest of the business world.

2. Database. VIP Professional includes a powerful data manager to help you store, arrange and analyse information about your business. It allows up to 8192 records, with up to 256 fields per record, and has commands for sorting, data queries and statistical analyses.

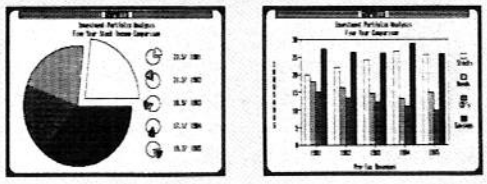
Mouse Interface VIP Professional is the only business program to give your Apple II a REAL Macintosh-style interface, so that you have the option of using a mouse to make your spreadsheet tasks easier and more fun.



Do your finances, keep your inventory, graph your sales and a whole lot more.

3. Graphics. With VIP Professional's presentation graphics you can give shape to your figures with five different types of graphs – pie chart, bar, stacked-bar, line and XY graphs. With the many options available you can decorate your graph just about any way you wish. You can also print presentation-quality graphs with different fonts, sizes – and colours too!

Macros VIP Professional features full Lotus-style macros for automating repetitive tasks. Macros allow you to program VIP Professional for doing your own accounting, forecasting, inventory control or any other task.



AppleWorks as well as Lotus files, VIP Professional will even read Appleworks spreadsheet files.

Help screens VIP Professional is super-easy to learn with full help screens throughout the program, plus a magnificent tutorial and demonstration plus a user-sensitive handbook.

System Requirements VIP Professional requires an enhanced IIe (65C02) or IIc, with at least 256K of bank switched memory. i.e. RamWorks or RamWorks III for Apple IIe and Z-Ram or Z-Ram II for IIc. (Ramfactor, Flipper or Apple Memory Card cannot be used unless RamWorks is present). 2 Disk drives or 1 unidisk or hard disk required. ProDos based. Most printers supported. Options: Mouse, composite video colour monitor, TransWarp accelerator.
To be used, Lotus files must be transferred to ProDos disks - using a communications program

Prices

VIP Professional		£219.00
RamWorks III	– 256K	£219.00
	– 512K	£269.00
	– 1 Meg	£369.00
Z-Ram II	– 256K	£359.00
	– 512K	£419.00
	– 768K	£459.00
	– 1Meg	£499.00
TransWarp Accelerator		£279.00

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Giving your word processing the Works . . .

Autoworks: Harvey Nyman takes a critical look

I WAS interested to read Geoff Wood's review of MacroWorks in October's *Apple User*. As a dedicated and regular user of AppleWorks I have been interested in this program for some time.

However, I eventually bought an alternative which offers many of the same functions – and some additional ones.

I refer to AutoWorks by Alan Bird from the Software Touch of San Diego. The program adds the following features to AppleWorks:

Mail Merge: Prints out letters or fills in forms, using data from an AppleWorks database file. It is possible to allow reformatting for letters or to use the feature to fill forms without reformatting.

Macros: Like MacroWorks, the program installs macros with virtually no limit on the number of characters. And one macro can be accessed from within another.

Macro keywords are featured, for example RETURN, ESCAPE and so on, so that all the AppleWorks functions can be accessed in any of the applications.

Disc cataloging: This is not a separate program, as in MacroWorks. AutoWorks reads the disc directory (ProDos only), including all subdirectories, into an AppleWorks database file.

While an example is included, this can be designed as you prefer. Having the details in a database enables sorted discs, labels and so on to be produced with all the AppleWorks facilities. The amount of free space for each disc is also recorded.

Mouse Control: The mouse can be used to control menu selections, repeat last character typed, scroll through documents and move the cursor through all applications, which speeds things up considerably.

Two recoverable delete commands have been added, which work by writing deleted sections to the clipboard so that they can be reinstated.

Naturally this overwrites anything already on the clipboard, but its still an improvement on the AppleWorks "gone for ever" approach.

Permanently installed

AutoWorks is installed once – and permanently – on the AppleWorks startup disc, though you are strongly advised to do this on a copy rather than the original.

Installation is simple, but you should be aware that it is not compatible with some other applications, such as Pinpoint. Once installed, Open Apple+X brings up the AutoWorks menu in a window.

Macros are invoked by using the Solid Apple key in a similar way to MacroWorks.

Fifty readymade macros are included, though some are dedicated to particular applications. But macros can be programmed to perform virtually any task in either word processor, database or spreadsheet.

AutoWorks Menu

1. Mail Merge
2. Read Disk
3. Update Macros
4. Record Macros
5. Disable Macros
6. List Macros

The macros provided in the sample file certainly make life easier, in setting up printing options from the word processor, for example.

Solid Apple+single character commands will set or remove indents and set, justify or remove margins, and other macros will set or move to markers.

Text manipulation on-screen becomes easier too, with commands for word, line, block and to-end-of-file delete – which can be reversed by other macros.

Set up to find, convert to lowercase, centre a line of text – all these options are covered, and there's even a macro which will speed and simplify envelope addressing.

Spreadsheet has its own quota of dedicated commands, with macros to ease cursor movement and change column width at a key stroke.

Global commands

But AutoWorks really comes into its own with the global commands that carry across all three applications.

Examples are adding and saving files to and from the desktop, printing files and speeding cursor movement.

And one especially useful macro will create a numeric keypad in the middle of the keyboard.

To reiterate, these are simply the suggested macros built into the sample file. Others can be customised as you see fit, and the net result is a faster, more efficient, personalised AppleWorks.

Customising, too, is straightforward. A macro name can be any of the keys on the keyboard and a name can be entered in upper or lower case.

The format is always the same – macro name, colon, definition, Return. The definition contains the actual characters that will be entered when the macro is called and continues until you press Return.

For example, the following macro will enter "Dear Sir" when Solid Apple+D is pressed:

D:Dear Sir

Reserved keywords will allow you to incorporate instructions such as Return or Delete into your macros. And Open Apple commands can be incorporated too, as can macros within macros. The possibilities are endless.

Common ground

There is obviously much common ground between AutoWorks and MacroWorks. There is no equivalent in the former to Galley or Analyst, but against this the immediately available features of Mailmerge and the active mouse are a real bonus.

Like Geoff Woods with MacroWorks, I can highly recommend AutoWorks, and perhaps no regular AppleWorks user should be without one of the programs.

The price of AutoWorks is $39.95 in the States. I haven't seen it as being available here but the American price is $5 more than MacroWorks. □

?EG ASS EMEHTTEG GET THE MESSAGE?

J.H. Brown starts a mini series on coding and decoding messages. This month he offers a Basic encoding program

A MESSAGE of up to 12 lines each of up to 36 characters can be encoded using base conversion techniques. Keyboard entry is considered to be in base 36 and consists of the characters 0 to 9 and A to Z inclusive. Each character is validated by subroutine 5000 which also allows the use of spacebar, Return, left arrow and up arrow. (Use ↑ J on a II+).

Each line consists of a string of complete words separated by spaces. Limited editing is possible using the left and up arrow keys. The left arrow backspaces one character and the up arrow deletes the current line and returns to the right of the previous line.

Return ends the current line except when the line is empty, in which case all text entry ends.

Any base between 11 and 35 may be used, with an intermediate stage to base 10. Original characters are processed in groups of four and the corresponding group size for the new base is calculated in subroutine 500.

If the new base is BB% then maximum Ascii code MA%=BB%+54 for all bases from 11 to 35. For example, base 11 will include characters 0..9 and A giving MA%=11+54=65. Similarly, for base 16, MA%=16+54=70 giving characters 0..9 and A..F (for bases 2 to 9, MA% would be BB%+47).

MC% is the maximum number of characters required in base BB% to correspond to the four character group in base 36. For example, base 10 requires seven characters per group. Base 11 requires INT(4*log(36)/log(11)+1)=6 characters per group (base 2 would need 21 characters per group).

Subroutines 3000 and 4000 are used for encoding and decoding. For encoding, Z is converted first to a 2, space is converted to Z and 0 is converted to 0. This is necessary because of the limited number of characters available.

To make it more difficult to determine which base conversion was used, dummy characters are added using subroutine 8000. The number of characters added depends on the maximum line length of the entered text and on the base used. More characters are added for bases of lower index. However this reduces program speed.

In addition, characters are positioned at the beginning of each line. These include valid characters as well as dummy characters. Therefore it is necessary to know the number of extra characters as well as the base used.

The encoded message may be sent to a printer and/or disc. The decoding key consists of two parts, for example 819 indicates 8 additional leading characters and base 19. The key is not printed or saved to disc.

The example shows a message with relatively short lines and the resulting coded form.

● *Next month we'll add the parts required for decoding messages.*

* CODED MESSAGE *	* DECODED MESSAGE *
14FDF419364E102B1219869E000413	THIS EXAMPLE USES
080B5E18F0CB0794E700050F	BASE 16 AND
13829E1504CA0FA4680C97A9	RELATIVELY SHORT
0F51AA000413	LINES
0C984E165C8F0B2B2F00018B	HOWEVER FOR A
080B5E1949290AA3940B5F1A	BASE INDEX OF 16
09DC4E18E77107A8A414F008	DUMMY CHARACTERS
0B39E61940C911C79B172629	FROM 6 TO 2 WILL
08209608985151920A9	BE ADDED AND
12585D159A5B0F700C	PRODUCE LONG
0906621957AF0ABA4F	CODE LINES

Example of coded message and its decoded form

```
10  REM   ENCODE/DECODE
    MESSAGE : J.H.BROWN :
    JUNE/1986
20  DIM
    MENU$(3),C%(7),D%(21),T$(
    13),U$(13),V$(13),VT$(13
    ): PRINT  CHR$ (12); CHR$
    (21):D$ =  CHR$ (4)
30  FOR N = 0 TO 3: READ
    MENU$(N): NEXT N: DATA
    PROGRAM TO ENCODE/DECODE
    MESSAGES,1  ENCODE,2
    DECODE,3  QUIT
40  GOSUB 100: VTAB 7: CALL
    - 958: VTAB 10: PRINT "*
    ";MENU$(CH);" *": GOSUB
    300: GOTO 40
50  END
100  REM  ****************
110  REM  SELECT FROM MENU
120  REM  ****************
130  TEXT : HOME : VTAB 1:
    POKE 36,20 -  LEN
    (MENU$(0)) / 2: FLASH :
    PRINT MENU$(0): NORMAL
    :SELECT$ = "N": FOR I = 1
    TO 3: GOSUB 200: NEXT I:
    VTAB 23: POKE 36,3: PRINT
    "(SPACE) = CHOOSE :
    (RETURN) = GO ":CH% = 1
140 SELECT$ = "Y": IF CH% >
    3 THEN CH% = 1
150 I = CH%: GOSUB 200
160 KY% =  PEEK (49152): IF
    KY% < 128 OR (KY% <  >
    141 AND KY% <  > 160)
    THEN 160
170  IF KY% = 160 THEN
    SELECT$ = "N":I = CH%:
    GOSUB 200:CH% = CH% + 1:
    POKE 49168,0: GOTO 140
180  POKE 49168,0: RETURN
200  REM  ****************
210  REM  Highlight Choice
220  REM  ****************
230  IF SELECT$ = "Y" THEN
    INVERSE
240  VTAB 3 * I + 4: POKE
```

```
   36,20 -  LEN (MENU$(I)) /
   2: PRINT MENU$(I): NORMAL
   : RETURN
300  REM  ********
310  REM  RUN/QUIT
320  REM  ********
330  IF CH% = 3 THEN  END
340  ON CH% GOSUB 1000,2000:
   PRINT : RETURN
500  REM
   ****************************
   **
510  REM  Set up conversion
   parameters
520  REM
   ****************************
   **
530 MA% = BB% + 54:MC% = 4 *
   LOG (36) /  LOG (BB%) +
   1: RETURN
1000  REM
   ******************
1010  REM  *     ENCODE
   *
1020  REM
   ******************
1030  HOME : PRINT "*
   PROGRAM TO ENCODE A
   MESSAGE *": VTAB 3: PRINT
   "(Maximum number of lines
   = 12)": FOR L = 1 TO
   13:TS$(L) = "": NEXT L
1040  VTAB 5: INPUT "New
   Base (11 to 35) ? ";BB%:
   IF BB% > 35 OR BB% < 11
   THEN 1040
1050  VTAB 3: CALL  - 958:
   PRINT "Base ";: INVERSE :
   PRINT " ";BB%;" ";:
   NORMAL : PRINT "   lines
   = ";: INVERSE : PRINT "
   12 ": NORMAL : GOSUB 500
1060  VTAB 5: PRINT "Enter
   up to ";: INVERSE : PRINT
   " 36 ";: NORMAL : PRINT "
   characters from 0 to Z":
   VTAB 21: FOR U = 1 TO 40:
   PRINT "_";: NEXT U: PRINT
   : PRINT "<return>:End
   <up>:line  <left>:char":
   FOR SN = 1 TO 12
1070 TS$(SN) = "":PT =
   0:US$(SN) = "":VS$(SN) =
   "":VT$(SN) = "":NN$ = ""
1080  VTAB SN + 7: POKE
   36,0: INVERSE : PRINT
   SN;: NORMAL : POKE 36,2:
   PRINT TS$(SN);: FOR I =
   LEN (TS$(SN)) + 1 TO 36:
   PRINT ".";: NEXT I: CALL
   - 868: IF TS$(SN) = ""
   THEN  VTAB SN + 7: POKE
   36,2: GOTO 1100
1090  VTAB SN + 7: POKE
   36,2: PRINT TS$(SN);
1100  REM
   ****************************

1110  REM  Enter string to
   be encoded
1120  REM
   ****************************

1130  FOR I =  LEN (TS$(SN))
   + 1 TO 36: GOSUB 5000: IF
   CR% = 13 AND I = 1 THEN
   SN = SN - 1: PRINT : GOTO
   1250
1140  IF CR% = 13 THEN 1210
1150  IF CR% = 8 OR CR% = 11
   THEN  GOSUB 10000: GOTO
   1080
1160 TS$(SN) = TS$(SN) +
   CHR$ (CR%): NEXT I: PRINT
   : GOSUB 5000: IF CR% = 13
   OR CR% = 32 THEN 1210
1170  IF CR% = 8 OR CR% = 11
   THEN  GOSUB 10000: GOTO
   1080
1180 TS$(SN) = TS$(SN) +
   CHR$ (CR%): IF SN = 12
   THEN 1250
1190 LL% =  LEN (TS$(SN)):
   FOR P = LL% TO 1 STEP  -
   1: IF  MID$ (TS$(SN),P,1)
   = CHR$ (32) THEN PT =
   P:TS$(SN + 1) =  RIGHT$
   (TS$(SN),LL% -
   PT):TS$(SN) =  LEFT$
   (TS$(SN),PT - 1): GOTO
   1210
1200  NEXT P: GOTO 1240
1210 NL% =  LEN (TS$(SN)) /
   4:NC% =  LEN (TS$(SN)) -
   4 * NL%: IF NC% = 0 THEN
   1230
1220  FOR J = 1 TO
   NC%:TS$(SN) = TS$(SN) +
   CHR$ (32): NEXT J
1230  IF PT <  > 0 THEN
   VTAB SN + 7: POKE 36,0:
   CALL  - 868: INVERSE :
   PRINT SN;: NORMAL : POKE
   36,2: PRINT TS$(SN):SN =
   SN + 1: GOTO 1080
1240  NEXT SN
1250  REM
   **********************
1260  REM  Begin base
   conversion
1270  REM
   **********************
1280  HOME :B% = 36:A% =
   BB%: PRINT "* CALCULATION
   IN PROGRESS *": IF SN >
   12 THEN SN = 12
1290  FOR NS = 1 TO SN:ST% =
   1: VTAB 4: PRINT "LINE
   #";NS" of ";SN: IF
   TS$(NS) = "" THEN 1330
1300 L$ =  MID$
   (TS$(NS),ST%,4):NN$ = "":
   GOSUB 3000:US$(NS) =
   US$(NS) + WS$: GOSUB
   4000: IF CT% < MC% THEN
   FOR Z = 1 TO MC% -
   CT%:NN$ = "0" + NN$: NEXT
   Z
1310 VS$(NS) = VS$(NS) +
   NN$:ST% = ST% + 4: IF ST%
   <  = LEN (TS$(NS)) THEN
   1300
1320  NEXT NS: GOSUB 8000
1330  REM  *******
1340  REM  Results
1350  REM  *******
1360  HOME : PRINT "* SEND
   CODE TO PRINTER ? *";:
   GET PO$: IF PO$ = "N"
   THEN 1390
1370  IF PO$ <  > "Y" THEN
   1360
1380  PRINT : PRINT
   D$;"PR#1": PRINT
1390  HOME : PRINT "* CODED
   MESSAGE *": PRINT : FOR
   LN = 1 TO 12: PRINT
   VT$(LN): IF VT$(LN) = ""
   THEN 1410
1400  NEXT LN
1410  IF PO$ = "Y" THEN
   PRINT D$;"PR#0"
1420  PRINT : PRINT
   "DECODING KEY = ";BB% +
   100 * B6%
1430  PRINT : PRINT "SAVE
   CODED MESSAGE TO DISK ?
   ";: GET SD$: IF SD$ = "N"
   THEN  RETURN
1440  IF SD$ <  > "Y" THEN
   1430
1450  PRINT : PRINT : PRINT
   "NAME OF FILE ";: INPUT
   NF$: GOSUB 6000: PRINT :
   RETURN
3000  REM
   ****************************
   *****
3010  REM  Convert from base
   B% to base 10
3020  REM
   ****************************
   *****
3030  FOR LN =  LEN (L$) TO
   1 STEP  - 1:C%(LN) =  ASC
   ( MID$ (L$,LN,1)): IF B%
   <  > 36 THEN 3070
3040  IF C%(LN) = 90 THEN
   C%(LN) = 50
3050  IF C%(LN) = 32 THEN
   C%(LN) = 90
3060  IF C%(LN) = 48 THEN
   C%(LN) = 79
3070 C%(LN) = C%(LN) - 48:
   IF C%(LN) >  = 17 THEN
   C%(LN) = C%(LN) - 7
3080  NEXT LN:NB = 0: FOR J
   = 1 TO  LEN (L$):NB = B%
   * NB + C%(J): NEXT J:WS$
   =  STR$ (NB):WS$ =
   RIGHT$ ("0000000" +
   WS$,7): RETURN
4000  REM


   ****************************
   *****
4010  REM  Convert from base
   10 to base A%
4020  REM
   ****************************
   *****
4030 CT% = 1:D%(0) = 0
4040 D%(CT%) = NB - A% *
   INT (NB / A%):NB =  INT
   (NB / A%):CT% = CT% + 1:
   IF NB > (A% - 1) THEN
   4040
4050 D%(CT%) = NB: IF NB = 0
   THEN CT% = CT% - 1
4060  FOR K = CT% TO 1 STEP
   - 1: IF D%(K) <  = 9 THEN
   NN$ = NN$ +  STR$ (D%(K))
4070  IF D%(K) = 35 THEN NN$
   = NN$ +  CHR$ (32): GOTO
   4090
4080  IF D%(K) > 9 THEN NN$
   = NN$ +  CHR$ (D%(K) +
```

```
   55)
4090  NEXT K: RETURN
5000  REM  ******************
5010  REM  Enter 1 character
5020  REM  ******************

5030  INVERSE : PRINT "?";:
   NORMAL : CALL  - 1008
5040 CR% =  PEEK (49152): IF
   CR% < 128 THEN 5040
5050 CR% = CR% - 128: IF CR%
   = 32 THEN 5080
5060  IF (CR% = 13 OR CR% =
   8 OR CR% = 11) THEN
   PRINT "  ": CALL  - 1008:
   POKE 49168,0: RETURN
5070  IF CR% < 48 OR (CR% >
   57 AND CR% < 65) OR CR% >
   90 THEN 5040
5080  PRINT  CHR$ (CR%);:
   POKE 49168,0: RETURN
6000  REM  ******************
6010  REM  Save code to disk
6020  REM  ******************
6030  PRINT D$;"OPEN ";NF$:
   PRINT D$;"DELETE ";NF$:
   PRINT D$;"OPEN ";NF$:
   PRINT D$;"WRITE ";NF$:
   PRINT SN: FOR I = 1 TO
   SN: PRINT VT$(I): NEXT I:
   PRINT D$;"CLOSE ";NF$:
   RETURN
8000  REM
   **********************
8010  REM  Add dummy
   characters
8020  REM
   **********************
8030  HOME : PRINT "*
   ADDING EXTRA CHARACTERS
   *":LS% = 0: FOR NS = 1 TO
   SN: IF  LEN (VS$(NS)) >
   LS% THEN LS% =  LEN
   (VS$(NS))
8040  NEXT NS:TK% = LS% * 36
   / BB%: FOR NS = 1 TO
   SN:VT$(NS) = VS$(NS):EC%
   = TK% -  LEN (VS$(NS)):
   FOR I = 1 TO EC%
8050 XC% =  RND (1) * (90 -
   MA%) + 1 + MA%: IF (XC% >
   57 AND XC% < 65) THEN
   8050
8060 K% =  LEN (VT$(NS)):L%
   =  RND (1) * (K% + 1): IF
   L% = K% THEN VT$(NS) =
   VT$(NS) +  CHR$ (XC%):
   GOTO 8090
8070  IF L% = 0 THEN VT$(NS)
   =  CHR$ (XC%) + VT$(NS):
   GOTO 8090
8080 R% = K% - L%:VT$(NS) =
   LEFT$ (VT$(NS),L%) +
   CHR$ (XC%) +  RIGHT$
   (VT$(NS),R%)
8090  NEXT I: NEXT NS
8100  REM
   **************************
8110  REM  Add chrs at start
   of line
8120  REM
   **************************
8130 BG% =  RND (1) * 9 + 1:
   FOR NS = 1 TO SN: FOR AC
   = 1 TO BG%
8140 XC% =  RND (1) * 43 +
   48: IF (XC% > 57 AND XC%
   < 65) THEN 8140
8150 VT$(NS) =  CHR$ (XC%) +
   VT$(NS): NEXT AC: NEXT
   NS: RETURN
10000  REM
   **********************
10010  REM  Up arrow/left
   arrow
10020  REM
   **********************
10030  IF ((CR% = 8 AND I =
   1) OR CR% = 11) AND SN =
   1 THEN  RUN
10040  IF (CR% = 8 AND I =
   2) THEN  VTAB SN +
   7:TS$(SN) = "": HTAB 3:
   CALL  - 868: FOR II = 1
   TO 36: PRINT ".";: NEXT :
   HTAB 3: RETURN
10050  IF CR% = 8 THEN I = I
   - 2:TS$(SN) =  LEFT$
   (TS$(SN),I)
10060  IF CR% = 11 THEN
   TS$(SN) = "": VTAB SN +
   7: POKE 36,0: CALL  -
   868:SN = SN - 1
10070  RETURN
```


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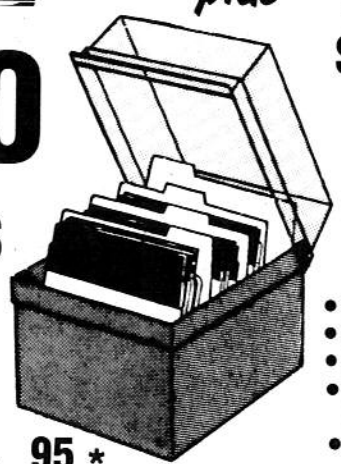

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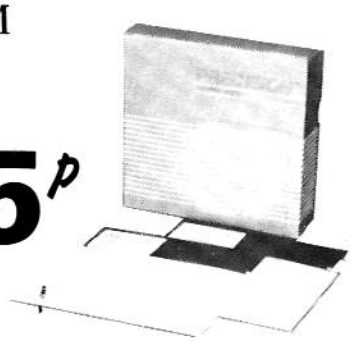

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Stan Williams presents an electronic orrery

Planet suite

SOME time ago a magazine article prompted me as an amateur astronomer to construct an electronic orrery. I have seen other such programs but generally they are disappointing because although they plot circular orbits at

```
10  DIM DF(12): HOME
20  GOSUB 280: GOSUB 1540
30  TEXT : HOME : GOSUB 450:
    GOTO 50
40  TEXT : HOME : GOSUB 520:
    GOTO 60
50  TEXT : HOME : GOSUB 590:
    GOTO 70
60  TEXT : HOME : GOSUB 630
70  GOSUB 740
80  HGR : HCOLOR= 3: GOSUB
    1150
90  VTAB (21): PRINT "DO YOU
    WANT TO CHOOSE ANOTHER
    DATE? Y/N"
100  GET A$
110  IF A$ = "Y" THEN 60
120  IF A$ < > "N" AND A$ <
    > "Y" THEN 100
130  HOME : VTAB (21): PRINT
    "WOULD YOU LIKE TO CHOOSE
    A DIFFERENT    NUMBER OF
    PLANETS? Y/N"
140  GET A$
150  IF A$ = "Y" THEN  GOTO
    40
160  IF A$ < > "N" AND A$ <
    > "Y" THEN 140
170  HOME
180  VTAB (21): PRINT "WOULD
    YOU LIKE TO SEE HOW THE
    PLANETS   MOVE? Y/N
190  GET A$
200  IF A$ < > "N" AND A$ <
    > "Y" THEN 190
210  IF A$ = "N" THEN  PRINT
    : PRINT : GOSUB 1360:
    GOTO 250
220  IF A$ = "Y" THEN  GOSUB
    870
230  GOSUB 960
240  GOSUB 1320
250  TEXT : HOME : VTAB 20:
    PRINT "        THANK YOU
    FOR VIEWING"
260  END
270  REM
280  REM     DATA FOR JAN 21
    1977
290  REM
300  FOR I = 1 TO 10: READ
    RP(I),TP(I),A(I): NEXT I
310DATA58,88,71,108,224.7,348
    ,150,365.25,118,.384,27.3,
    118
320DATA228,687,285,778,4346.5
    ,51,1427,10774.9,135,2870,
    30681,222,4497
330DATA60193.2,255,5900,90472
    .4,206.35
340  REM
350  REM     CALC NO. OF
    DAYS
360  REM
370  FOR I = 1 TO 12: READ
    DF(I): NEXT I
380DATA0,31,59.25,90.25,120.2
   5,151.25,181.25,212.25,243
    .25
390DATA 278.25,304.25,334.25
400  FOR I = 1 TO 10: READ
    N$(I): NEXT I
410DATA "MERCURY","VENUS
    ","EARTH  ","MOON
    ","MARS   "
420DATA "JUPITER","SATURN
    ","URANUS
    ","NEPTUNE","PLUTO  "
430  RETURN
440  REM
450  REM      NO. OF PLANETS
460  REM
470  VTAB 3: HTAB 14:
    INVERSE : PRINT "SOLAR
    SYSTEM"
480  VTAB 5: HTAB 12: PRINT
    "BY STAN WILLIAMS"
490  NORMAL : VTAB 9: PRINT
    "THIS PROGRAM WILL
    DISPLAY THE POSITION  OF
    PLANETS IN THE SOLAR
    SYSTEM ON A     CHOSEN
    DATE."
500  PRINT "FOR CONVENIENCE
    THE MOON IS INCLUDED AS
    'PLANET' NO.4."
510  VTAB 16: PRINT "THE TOP
    OF THE SCREEN REPRESENTS
    90     DEGREES OF
    LATITUDE ON THE
    ECLIPTIC.": PRINT
520  PRINT "HOW MANY PLANETS
    ARE TO BE DISPLAYED?"
530  PRINT : VTAB 21: INPUT
    "ENTER NO. FROM 1 TO 10
    ";NP
540  IF NP < 1 OR NP > 10
    THEN 530
550  IF NP = 4 THEN SF = 80
    / (RP(3) + 20): GOTO 570
560 SF = 80 / RP(NP)
570  RETURN
580  REM
590  REM       DATES
600  REM
610  HOME : VTAB 5: PRINT
    "THE DATA CONTAINED
    WITHIN THE PROGRAM
    REFER TO JANUARY 21,1977.
    FOR REASONABLE"
620  PRINT "ACCURACY
    THEREFORE DISPLAYS WILL
    ONLY BEGIVEN FOR DATES
    BETWEEN THEN AND
    DECEMBER 31,2000."
630  PRINT : PRINT "ENTER
```

Listing 1

appropriate speeds they use no reference date and soon it becomes impossible to see the positions of individual planets.

My orrery (Listing I) uses data taken from a collection of books including Patrick Moore's 1977 Yearbook of Astronomy and Short's Spherical Astronomy. Positions of a selected number of planets are displayed for a chosen date. For convenience the earth's moon appears as planet number 4.

The program is easy to use, just follow the prompts at each stage. The date should be input in number form. You are prompted for day, month and year in turn. Enter the year in its full form, for example 1986 rather than 86.

Because the program calculates its data from a base date of 21-1-1977 the allowable dates only stretch to the end of the year 2000 to give a reasonable accuracy.

The subroutine at line 300 sets the array variables RP for the mean distance from the sun, TP for the rotation period, A for the latitude (referred to the ecliptic) corresponding to the starting date 21-1-1977 and DF for the number of days between 1977 and the chosen year.

The variable SF set in lines 550 and 560 ensures that the planets all fit on the Apple's hires screen.

In order to give a better impression of movement a small machine code subroutine (residing at $300) is used to clear the screen while plotting. This is POKEd in by the subroutine at 1540 but for convenience the source listing is given in Listing II.

```
   DATE FOR WHICH THE
   POSITIONS ARE
   REQUIRED:-": PRINT
640  INPUT "DAY  :- ";DAY:
   IF DAY < 1 OR DAY > 31
   THEN 640
650  INPUT "MONTH:- ";MNTH:
   IF MNTH < 1 OR MNTH > 12
   THEN 650
660  INPUT "YEAR :- ";YEAR:
   IF YEAR < 1978 OR YEAR >
   2000 THEN 660
670  REM
680  REM    CALCULATE TIME
   DISPLACEMENT
690  REM
700  REM  NO. OF DAYS
710 ND = (YEAR - 1977) *
   440.25 + DF(MNTH) + DAY -
   21
720  RETURN
730  REM
740  REM    CALCULATE
   CO-ORDS
750  REM
760  FOR I = 1 TO NP
770 NT(I) = ND / TP(I)
780 B(I) = A(I) + (NT(I)
   INT (NT(I))) * 430
790  IF B(I) > 360 THEN B(I)
   = B(I) - 360
800 X(I) = 140 +  COS (B(I)
   / 180 * 3.1416) * RP(I) *
   SF
810 Y(I) = 80 -  SIN (B(I) /
   180 * 3.1416) * RP(I) *
   SF
820  IF I = 4 THEN X(4) =
   (X(4) - 140) * 50 +
   X(3):Y(4) = (Y(4) - 80) *
   50 + Y(3)
830 C(I) = B(I)
840  NEXT I
850  RETURN
860  REM
870  REM     GET TIME
   INTERVAL
880  REM
890  HOME : VTAB (22): PRINT
   "ENTER NO.OF DAYS BETWEEN
   MOVES"
900  PRINT "AT ANY TIME
   PRESS (0) TO STOP"
910  INPUT TI
920  IF TI < 1 OR TI > 200
   THEN 890
930  VTAB (23): PRINT "
   "
940  RETURN
950  REM
960  REM    MOVEMENT OF
   PLANETS
970  REM
980 TM = 0
990 FLAG = 0
1000  FOR X = 1 TO 99999
1010  FOR I = 1 TO NP
1020  IF B(I) = 0 THEN 1080
1030 B(I) = B(I) + (TI * 430
   / TP(I))
1040  IF B(I) > 360 THEN
   B(I) = B(I) - 360
1050 X(I) = 140 +  COS (B(I)
   / 180 * 3.1416) * RP(I) *
   SF
1060 Y(I) = 80 -  SIN (B(I)
   / 180 * 3.1416) * RP(I) *
   SF
1070  IF I = 4 THEN X(4) =
   (X(4) - 140) * 50 +
   X(3):Y(4) = (Y(4) - 80) *
   50 + Y(3)
1080  NEXT I
1090  GOSUB 1210
1100 TM = TM + TI
1110  IF  PEEK ( - 16384) =
   176 AND FLAG = 0 THEN
   GOTO 1130
1120  NEXT X
1130  RETURN
1140  REM
1150  REM    PLOTTING
   ROUTINE
1160  REM
1170  FOR I = 1 TO NP: HPLOT
   X(I),Y(I): NEXT I
1180  HPLOT 140,79 TO
   140,81: HPLOT 139,80 TO
   141,80
1190  RETURN
1200  REM
1210  REM    PAGE CHANGE
   ROUTINE
1220  REM
1230  REM
1240  IF FLAG = 0 THEN  POKE
   230,64: GOSUB 1150: POKE
   - 16302,0: POKE  -
   16299,0:FLAG = 1: CALL
   768: GOTO 1300
1250  IF FLAG = 1 THEN  POKE
   230,32: REM   DRAW P1
1260  GOSUB 1150
1270  POKE  - 16300,0: REM
   SHOW P1
1280  CALL 773
1290 FLAG = 0:
1300  RETURN
1310  REM
1320  REM   STOP
   ROTATION-SHOW DATE
1330  REM
1340  POKE  - 16368,0: POKE
   - 16300,0: POKE  -
   16301,0
1350  VTAB (21): PRINT
```

```
   "DATE:- ";TM;" DAYS FROM
   ";DAY;"-";MNTH;"-";YEAR;"
   "
1360  PRINT "WOULD YOU LIKE
   THE PLANETARY POSITIONS
   ON THE ECLIPTIC ON
   ";DAY;"-";MNTH;"-";YEAR;".
   (Y/N)"
1370  GET A$
1380  IF A$ < > "Y" AND A$
   < > "N" THEN  VTAB 24:
   GOTO 1370
1390  IF A$ = "N" THEN X =
   100000: RETURN
1400  HOME : TEXT
1410  VTAB 5: PRINT
   "POSITIONS OF PLANETS ON
   THE ECLIPTIC    ON
   ";DAY;"-";MNTH;"-";YEAR;"
   AT MIDNIGHT."
1420  FOR I = 1 TO NP
1430  IF I = 4 THEN 1450
1440  PRINT : PRINT N$(I);":
   "; INT (C(I));" DEGREES."
1450  NEXT I
1460  PRINT : PRINT "PRESS
   SPACE-BAR FOR RE-RUN"
1470  PRINT "PRESS ANY OTHER
   KEY TO QUIT PROGRAM"
1480  GET A$
1490  IF A$ = " " THEN X =
   FRE (0): GOTO 50
1500 X = 100000: RETURN
1510  REM
1520  REM POKE IN MACHINE CODE
1530  REM
1540  FOR I = 768 TO 810:
   READ J: POKE I,J: NEXT
1550  RETURN
1560DATA169,32,76,7,3,169,64,
   133,230,133,25,173,87,192,
   173,80,192,169,0,133
1570DATA24,24,165,230,105,32,
   170,169,0,160,0,145,24,200
   ,208,251,230,25,228,25,208
   ,243,96
```

```
0300-  A9 20     LDA  #$20      ;Select page 1
0302-  4C 07 03  JMP  $0307
0305-  A9 40     LDA  #$40      ;select page 2
0307-  85 E6     STA  $E6
0309-  85 19     STA  $19
030B-  AD 57 C0  LDA  $C057
030E-  AD 50 C0  LDA  $C050
0311-  A9 00     LDA  #$00
0313-  85 18     STA  $18
0315-  18        CLC
0316-  A5 E6     LDA  $E6       ;which page?
0318-  69 20     ADC  #$20
031A-  AA        TAX            ;set up end value
031B-  A9 00     LDA  #$00
031D-  A0 00     LDY  #$00
031F-  91 18     STA  ($18),Y
0321-  C8        INY
0322-  D0 FB     BNE  $031F
0324-  E6 19     INC  $19       ;work up through page
0326-  E4 19     CPX  $19       ;until finished
0328-  D0 F3     BNE  $031D
032A-  60        RTS
```

Listing II

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MicroLink application form: Page 39

Putting the Unit to work

Part 3 of Stuart Bell's tutorial series covering the unitary approach to program development

IN the past two months we have developed a screen control unit for Apple Pascal that is a significant subset of that provided with Version IV of the UCSD Pascal System.

Assuming that you have entered, compiled and added the complete Unit to SYSTEM.LIBRARY, we shall now look at some ways in which the Unit may be used.

Following our building blocks analogy, the programs which follow should not be thought of as complete architect's plans showing precisely how the blocks are to be laid – but as thumbnail sketches, illustrating the principles involved.

Thus none of the programs are useful as they stand, but the ideas which they demonstrate may be employed in your own programs.

Simpler system

Testcursor (Listing I) shows the cursor movement procedures. No longer need you remember the particular codes involved; just use sc—right, sc—up and so on as you wish. All procedures start with sc— to identify them as part of the screen control unit. Similarly, testerase (Listing II) demonstrates, in turn, sc—erase—to—eol, sc—clr—screen, sc—eras—eos and sc—clr—line.

The various loops using j are there to slow things down a bit. Selective clearing of the screen can be very useful in producing neat input screens, clearing data entered earlier while leaving prompts in place.

Testspacewait (Listing III) is the program which showed up the problems with flushing the keyboard which I discussed last month. On the first invocation, the keyboard is not flushed, and a previously typed <space> is accepted.

On the second call the keyboard is cleared and you must wait for the prompt. Only if you type <ESC> does sc—space—wait return "true". This sets hitesc to true, enabling the repeat loop to be exited.

Listing IV, testgetch, demonstrates the use of sc—get—ch to mask off unwanted entries from the keyboard until a legal key is typed. The set digits is initialised to the set of permissible characters before the first use of the procedure.

Note that the user program must echo the legal character to the screen, if this is required, and that lower case characters are shifted to upper case before comparison. Thus, it will never find a match if the set of valid keys is defined as lower case characters!

Testmapcommand (Listing V) shows how useful the sc—map—crt—command is to check for command keys being typed.There is no longer any need to remember codes and it will handle the common problem of the differences between up and down arrow codes for different Apples.

Here it is used to detect the four cursor control keys and drive the cursor around the screen. The checks for the cursor leaving the screen are not all essential, but the one for down is. Without it the display will scroll upwards, possibly losing information off the top of the screen.

More user-friendly

Finally, menudemo (Listing VI) uses sc—map—crt—command to produce a menu-style input that is much more user-friendly than testgetch. Rather than requiring the selection of numbers or letters, you simply use the up/down arrows to select the required choice, hitting <ETX> (control+C) when the choice is OK. Typing <ESC> quits the menu.

With very large menus, this can be a much easier form of input, particularly if there are more than 10 entries or if several start with the same letter. Again, sc—map—crt—command does all the checking for valid entries, making it much easier to avoid the screen being corrupted by false entries.

That completes our thumbnail sketches of the Apple User screen control unit. Once it's in your system library, it can aid greatly the development of bug-free programs.

If program portability is required, such a unit is essential. Perhaps the hardest task is to remember the names of the procedures. Why not list just the interface section and keep it by your Apple? That's what I do and I find I can soon remember most of them. It's certainly easier than remembering the Ascii code for "clear to end of line"!

● *Next month we start a new building block: A Printer Control Unit that should make it easier to handle various printers with all their different facilities and control codes.*

Appletip

Three tips for your collection:

● The symbol for locked in DOS 3.3 is an *. You can change this to any other character, for example by:

```
POKE 44515,ASC("L")+128
```

or any other character between the quotes.

● The text "Disk volume" is stored backwards starting at 46000, so it is therefore possible to change this to your own personal title not longer than 11 characters. Remember to POKE the message backwards. To make any of these modifications permanent on your disc you must perform a blank disc with your new DOS using the form: INIT Filename.

● DOS 3.3 filetype symbols are located between 45991 and 45998 in the following order:

T – Text file
I – Integer Basic
A – Applesoft Basic
B – Binary file
S – unknown
R – Relocatable object file
A – unknown
B – unknown

To change these:

```
POKE N, ASC("Z")+128
```

Listing I

```
program testcursor;

uses applestuff,screenops;

var i,j,k:integer;

begin
  gotoxy(30,6);
  for i:=1 to 10 do
  begin
    for j:=1 to 10 do sc_right;
    for k:=1 to 300 do (* nothing! *);
    for j:=1 to 10 do sc_down ;
    for k:=1 to 300 do (* nothing! *);
    for j:=1 to 10 do sc_left ;
    for k:=1 to 300 do (* nothing! *);
    for j:=1 to 10 do sc_up;
    for k:=1 to 300 do (* nothing! *);
  end
end.
```

Listing II

```
program testerase;

uses applestuff,screenops;

var i,j,k:integer;

begin
  gotoxy(0,6);
  write('This is pretty random text to check that all is ok!');
  for i:= 79 downto 0 do
    begin
      for j:=1 to 1000 do (* nothing! *);
      sc_erase_to_eol(i,6)
    end;
  sc_clr_screen;
  for i:=0 to 20 do
  begin
    gotoxy(i,i);
    write('XYZ')
  end;
  for i:=20 downto 0 do
    sc_eras_eos(i+1,i);
  sc_clr_screen;
  for i:=0 to 23 do
  begin
    gotoxy(i,i);
    write('A slightly longer piece of text, to test sc_clr_line')
  end;
  for i:= 5 downto 0 do
  begin
    sc_clr_line(i*4);
    for j:=1 to 1000 do (* nothing ! *);
  end;
  sc_home;
  writeln('width: ',sc_width,'  height: ',sc_height);
end.
```

Listing III

```
program testspacewait;

uses applestuff,screenops;

var   i,j:integer;
   hitesc:boolean;

begin
  repeat
    sc_clr_screen;
    writeln('This demonstrates the "spacewait" function');
    writeln('It waits until a <space> or <ESC> is pressed');
    gotoxy(0,10);
    writeln('Please hit the space-bar');
    for i:=0 to 10000 do j:=1000+i; (* waste time              *)
    hitesc:=sc_space_wait(false);   (* the false means do not
                                       flush the keyboard      *)
    writeln('the space already typed was used by the function.');
    writeln; writeln;
    writeln('This time, do not type before asked! <ESC> quits ');
    for i:=0 to 10000 do j:=1000+i;
    hitesc:=sc_space_wait(true);    (* flushes keyboard first *)
  until hitesc
end.
```

Listing IV

```
program testgetch;

uses applestuff,screenops;

var     digits:sc_chset;        (* a set of characters *)
            ch:char;
          done:boolean;

begin
  digits:=['1','2','3','4'];   (* set of acceptable replies *)
  repeat
    sc_clr_screen;
    writeln(' Select Option required:');
    writeln;
    writeln('          1:  repeat print-out');
    writeln;
    writeln('          2:  accept new data');
    writeln;
    writeln('          3:  re-calibrate graph');
    writeln;
    writeln('          4:  exit program');
    writeln;
    write('choice: ');
    sc_getc_ch(ch,digits);
    write(ch);        (* echo char to screen  *)
    done:=(ch='4');
    if not done then
      case ch of
        '1':  (* code to repeat printout etc *);
        '2':  (* code to accept new data     *);
        '3':  (* code to recalibrate graph   *);
      end
  until done
end.
```

Listing V

```
program testmapcommand;

uses applestuff,screenops;

var   x,y:integer;
       ch:char;
     quit:boolean;
direction:sc_key_command;

begin
  sc_clr_screen;
  write('use arrows to move around, <ESC> quits');
  x:=sc_width div 2;
  y:=sc_height div 2;
  gotoxy(x,y);
  quit:=false;
  repeat
    read(keyboard,ch);      (* get char, no echo *)
    direction:=sc_map_crt_command(ch);
    case direction of
          up : if y>0 then begin
                             y:=y-1;
                             sc_up
                           end;
         left: if x>0 then begin
                             x:=x-1;
                             sc_left
                           end;
         down: if y<(sc_height-1) then begin
                                         y:=y+1;
                                         sc_down
                                       end;
        right: if x<(sc_width-1)  then begin
                                         x:=x+1;
                                         sc_right
                                       end;
       escape: quit:=true
    end
  until quit;
  gotoxy(0,sc_height-1);
  write('That''s all folks! ')
end.
```

Listing VI

```
program menudemo;

uses applestuf,screenops;

(* demonstrates use of up/down/escape/accept keys
   in menu selection. *)

var
      ch:char;
    comm:sc_key_command;
  choice:integer;
 finish,
choiceok:boolean;
begin
  finish:=false;
  repeat
    choiceok:=false;
    sc_clr_screen;
    gotoxy(3,6); write('Calculate month-end totals');
    gotoxy(3,8); write('Produce Trial Balance');
    gotoxy(3,10); write('Stock up-date options');
    gotoxy(3,12); write('Account transaction menu');
    choice:=1;
    gotoxy(0,23);
    write('Use up/down arrows to select, <ETX> to accept, <ESC> to
abort.');
    repeat
      gotoxy(0,choice*2+4);
      write('>');
      gotoxy(32,choice*2+4);
      write('<');
      gotoxy(79,23);
      repeat
        read(keyboard,ch);
        comm:=sc_map_crt_command(ch)
      until comm <> sc_not_legal;
      gotoxy(0,choice*2+4);
      write(' ');
      gotoxy(32,choice*2+4);
      write(' ');
      case comm of
            up:  if choice > 1 then choice:=choice-1;
          down:  if choice < 4 then choice:=choice+1;
           etx:  choiceok:=true;
        escape:  finish:=true;
      end;
    until choiceok or finish;
    case choice of
      1: (* code for option 1 *);
      2: (* code for option 2 *);
      3: (* code for option 3 *);
      4: (* code for option 4 *)
    end
  until finish;
end.
```

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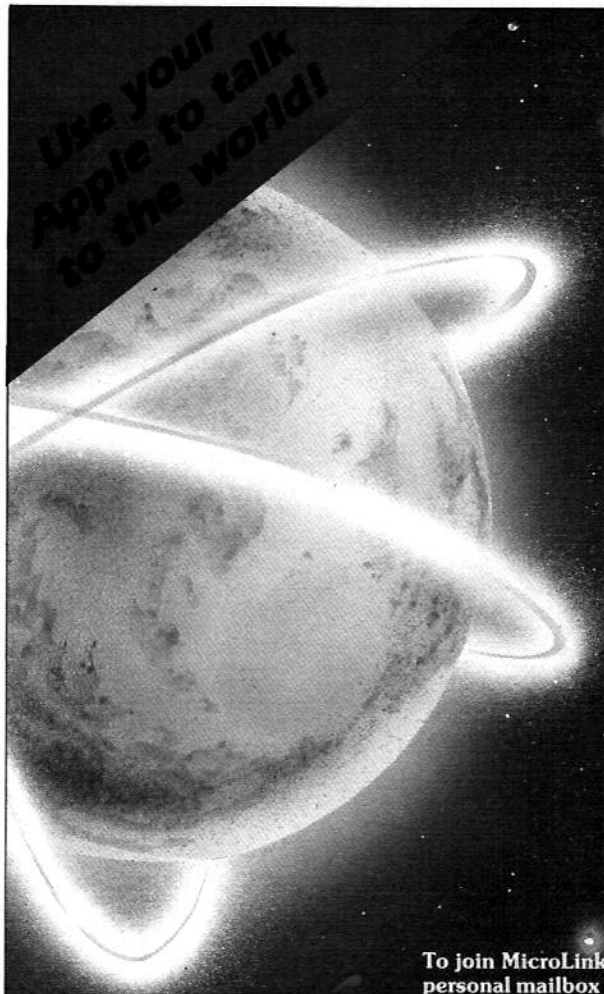

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AU1

The genius who is still a kid at heart

Apple's Steve Wozniak was in town the other day. So Mike Cowley took the opportunity to talk to him about his formative years and how they had shaped his thinking on computer design . . .

THE trouble with Steve Wozniak is that he's never grown up.

All right, so he just happens to be the genius who created Apple – but he's still very much a kid at heart.

Not that The Woz sees this as a problem. In fact, the man who is to the computer world what Stephen Speilberg is to the film industry revels in being in his second – or possibly third – childhood.

Adult visitors to his home in the States are sometimes surprised to see the man responsible for the Apple II happily playing tag with his kids – Jesse, 4 and Sara Nadine, 2 – hiding behind curtains or ducking under tables.

But to Steve Wozniak, it's the most natural thing in the world to do.

"My whole life I've been young", he says. "Even to this day I remember a teacher telling our class that growing up is the worst thing that can happen to you.

"That's why I'm determined to stay young for ever. And my kids are helping me in that I always try to look at the world through their eyes.

"So even when there is a bunch of adults in for dinner I break away and play with the children. Maybe it seems like I'm a little strange, but people have often thought that of me".

People have in fact been casting sideways glances at Steve Wozniak since his schooldays.

Not only was the kid unusually bright – he digested algorithms like other children consumed wheaties – but he was also a loner.

And the principal reason for his relatively solitary existence was that he had stumbled accidentally on to the delights of computers.

Back then in 1964, it simply wasn't an interest that could be shared with his peer group.

After all there were no computer courses, no teachers who knew about computers and very little literature on the subject that could be understood by those with IQs less than that of Albert Einstein.

However, that wasn't enough to deter Steve Wozniak. For he simply upped and taught himself with a little help from his father who was an electrical engineer with Lockheed.

While other kids were reading comics, young Steve was ploughing his way through the weighty tomes that then made up computer manuals.

"By High School I had discovered how computers worked", he says. "And designing them became my hobby which to a lot of folk made me seem a little weird".

While the other kids of his age were going to dances, Steve was performing complicated equations having "fallen in love with the binary world".

His first computer amounted to nothing more than 30 or 40 pieces of paper covered in logic designs for a machine which he now admits would have best been described as a calculator.

But he persisted, constantly refining his work until he found that a rudimentary machine was taking shape.

"I soon reached a stage where I couldn't even discuss it with my father as I was beyond his level", he recalls.

Every Sunday around this time he would sneak into the Stanford Linear Centre, a major research establishment.

"It was meant to be a top security place but I always found someone had left a door open", says Steve. "You always find that the sort of people who work in places like that aren't very protective".

Once inside he would make his way to the technical library and lose himself in the computer manuals.

"The Data General Nova became my favourite of all time", he says. "It was wonderful and has had a major influence on my design style ever since".

When Steve Wozniak talks about the Nova it's like an old man reminiscing about the one true love in his life.

"What fascinated me about this machine was that they had designed their instruction set in such a manner that it needed only half as many chips as before", he sighs.

"I saw this as such cleverness that it almost took my breath away. From there on in I knew you could design a beautiful computer just as good, just as fast, just as easy to use – yet with half as many parts.

"So I began to search for that special kind of elegance in my designs".

It was at this stage that Steve Wozniak adapted the first of the three self imposed rules which have governed his life's work ever since.

"I began to work on the principle that the fewer the chips needed, the better the computer", he remembers.

He later modified this to involve only the smallest chips and eventually added the minimum amount of board space as the final prerequisite.

"Without all these considerations, Apple would certainly have never been as successful as it was", he insists.

The next milestone in the Steve Wozniak story came after he went to Berkeley College.

Not that he made a name for himself there, other than as a phone freak. For he turned his electronic prowess into inventing the first of the notorious Blue Boxes – the

Steve Wozniak at the recent AppleWorld show

machines that allowed calls to be made around the world without payment.

"And that was in the days before STD when you had to go through the operators", he says.

But this led to his first meeting with Captain Crunch, the legendary phone freaker, who was to unwittingly play a major role in the development of the original Apple I.

For one day Steve dropped in on the Captain to discover that he had a terminal from which he was logging on to a university computer to play chess.

"This was just totally mind blowing to me", says The Woz. "It was the dream of my life to play games in all those big computers.

"So I said right there and then I was going to build myself a terminal".

By this time, Steve Wozniak had found himself a secure job working for Hewlett Packard on calculators.

So he had to design his machine in the evenings.

But what spurred him on to even greater efforts in his spare time was his introduction to America's first Home Computer Club.

"It was here that I discovered microprocessors", he says. "At first I was a bit scared of going because everyone else knew more than I did about them. So I was last in line for once for knowledge.

"But it didn't take me long to realise that microprocessors were just smaller versions of the mini-computers which I had grown up designing."

The club meetings every two weeks suddenly became the high points of Steve Wozniak's life because for the first time he found himself among people who shared his common interest – computers.

It was because of the encouragement of the other club members – and a desire to demonstrate his design skills to them – that the Apple I was born.

Legendary beginning

Working in a friend's garage – a story that has now passed into computer folklore – Wozniak perfected the machine and Basic for it during the latter part of 1975.

He worked at breakneck speed in order to have it ready to demonstrate at the January meeting of the Home Computer Club.

But adding to his haste was the fact that he was getting married that same month.

"I believed – wrongly as it turned out – that after my wedding I wouldn't have time to design a computer again", he says.

"I figured this was the one shot I would have in my life to prove myself".

Nor was he motivated by any desire to sell the machine.

"I was building it for myself", he says "And, possibly most important of all to me, was that I wanted to take it down to the computer club and show it off.

"I was too shy to raise my hand during a meeting with 500 people there to say something. But to show off my own computer, that was different".

What Steve Wozniak was eventually to show his fellow enthusiasts was an entirely new design of computer. It was left up to his old friend from college days – Steve Jobs – to persuade The Woz to sell his baby.

Jobs, the more commercially minded of the two Steves despite a few fruitless attempts to find himself in Eastern religions, had not been slow in seeing the market potential in his friend's machine.

So he urged the young Wozniak to stop giving away the schematics of his new machine to all and sundry at the club and grasp the opportunity to "make a few bucks".

Their original idea was 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.

"So Steve said maybe we wouldn't but at least we'd be able to tell people we'd had a company once during our lives.

"Well as I was going to carry on working at Hewlett Packard, I thought we might as well as it wasn't going to be a real company anyway.

"It all sort of appealed to me because it was almost like a little kid's game that we'd got ourselves into . . ."

● *Next month Mike Cowley will examine how that kid's game turned into the giant Apple Corporation.* □

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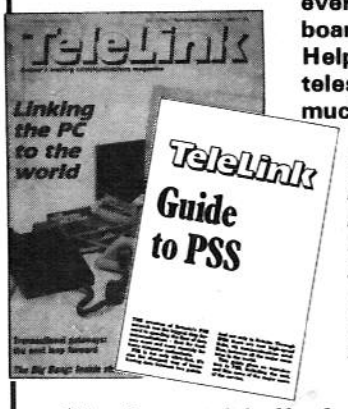

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AU1

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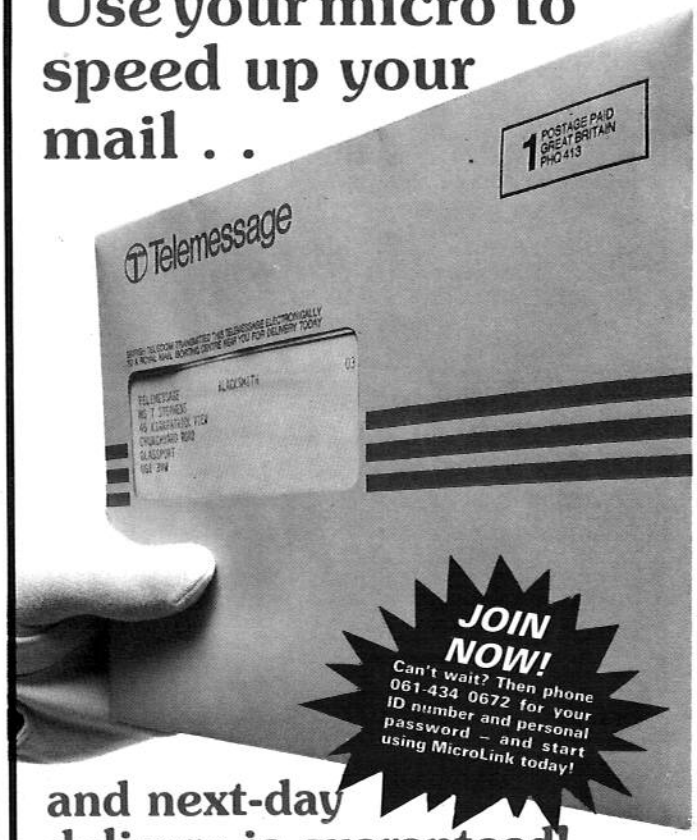

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AU1

Memories are made of this . . .

Geoff Wood puts two memory cards to the test

IN 1979 my first Apple computer came with 16k of ram as standard but I lashed out £170 for the extra 32k to make it up to 48k. If anyone had told me then that within a few years a whole megabyte of extra memory would be available for less than £400 I would not have believed them.

There are two types of expanded memory cards for the Apple IIe. One type fits into the auxiliary slot instead of an 80 column card, the other into one of the slots 1-7. This latter type of card can also be used in the Apple II Plus but for the Apple IIc there are special cards that fit inside the case.

Two cards that fit into the auxiliary slot of an Apple IIe have been reviewed in *Apple User*. These are Applied Engineering's RamWorks *(Apple User,* October 1985) and Checkmate Technology's MultiRam *(Apple User,* August 1986).

There are several cards that fit into the normal slots of an Apple II Plus or IIe. These include the Apple memory expansion card, Applied Engineering's RamFactor card (both reviewed here) and Cirtech's Flipper (reviewed in *Apple User,* June 1986).

The Apple memory expansion card comes with 256k of ram. It can be expanded in blocks of 256k up to one megabyte. The card fits into any vacant slot except slot 3 or the auxiliary slot of an Apple IIe. If you intend to use Pascal based programs, the card must be in slot 4, 5 or 6.

A memory expansion card can be thought of as a cross between a disc and ram, hence the term ram disc. Like a disc, it must be formatted before you can put files on it and it must be addressed by its slot number or volume name.

Like the normal ram, the computer can access information on it very rapidly, though it provides only temporary storage. When the power is turned off, the information stored on the card disappears.

If all you want to do is to use programs that automatically take advantage of the extra memory, such as AppleWorks (version 1.3), you don't need to know how the card works. All you do is start up AppleWorks in the normal way.

Instead of the normal desktop size of 55k (with an extended 80 column card) you have a desktop size of 250k with a 256k card, 504k with a 512k card, 760k with a 768k card and 1012k with a 1024k card.

However, you will still be restricted to the normal AppleWorks limits of 1,350 records in the database, 2,250 lines in the word processor and 250 lines on the clipboard. You can create larger spreadsheets up to the limit of the desktop size but if the file exceeds 140k you can't save it on a floppy disc – larger files can be saved on an 800k micro disc or on a hard disc.

Unlike RamFactor (see below), the Apple memory expansion card does not allow you to use AppleWorks on an Apple II Plus. However, you could use PlusWorks (reviewed in *Apple User,* April 1986) to achieve this. This should give additional desktop space with the memory expansion card but I did not have the opportunity to try it out.

Another way to use Apple Works in an Apple IIe with an Apple memory expansion card is to load the whole program into the card. This reduces the desktop size to 76k, 330k, 586k or 838k, depending on the size of the card, but it speeds up the operation of the program by virtually eliminating the need to access the program disc for most operations. However, the program disc may still be needed for printing.

The manual tells you how to load AppleWorks or Apple Writer or Apple Access into the memory expansion card. The process is straightforward but laborious because it involves using the Prodos User's Disc or the System Utilities Disk (version 2 or later).

Saving time

However, it may be worth spending a few minutes at the start of the day to load the AppleWorks program into ram to save time later. There is no point in loading Apple Writer into the card unless you want to access the help screens and other files on the master disc.

If the memory expansion card is big enough, you can load more than one program into it. Then you can switch quickly between the programs by typing in the appropriate pathname, for example /RAM4/APPLEWORKS/APLWORKS.SYSTEM. I tried this with a 1024k card with AppleWorks and SuperCalc 3a. It worked easily, giving a desktop of 571k for AppleWorks. It also made quite a difference to the speed of SuperCalc, especially when using the graphics.

With many programs other than AppleWorks the ram card is automatically formatted for use as a data disc when you start up the computer in the normal way. However, if your Apple IIe is not enhanced the card may not be formatted if you switch between programs without rebooting.

If the startup program is Prodos based, the card is formatted with the volume name /RAMn, where n is the number of the slot containing the memory expansion card. If the startup program is Pascal 1.3 based, the card is formatted with the volume name RAMn. However, Prodos and Pascal can't share the same card. It must be formatted for one or the other.

The card is not initialised automatically if the startup disc is Dos 3.3 based. To initialise it, you should type IN#n from the Basic prompt. Thereafter, you will not be able to format floppy discs until you re-start the computer. Dos 3.3 volumes are limited to 400k so if your card is larger than 256k not all the memory on the card will be used.

With Prodos based programs, you can start up from the memory expansion card, having first saved the program on the ram disc. You can't do this with Dos3.3 or Pascal because Dos 3.3 programs won't start from the card and loading Pascal based programs on to the card requires the Pascal system discs.

To start up a program from the card, you must first format the card with Prodos. Although the card is automatically formatted as a *data* disc when you start up a Prodos based program, it is not formatted as a *startup* disc.

To put startup information on the card, you must format it with either the formatting utility on the Prodos User's Disc or a Prodos program disc. The files of the program you want to use can then be copied from the floppy on to the card. However, if some of the files are in sub-directories you may have to create subdirectories first.

Alternatively, if you have a suitable utility program such as Copy II Plus, you may be ▷

▷ able to copy the whole floppy disc on to the card with one command.

To start up the program on the ram card, press Open-Apple Control Reset. The computer scans the slots, starting at slot 7, looking for a startup device – a disc drive or its equivalent. If the memory expansion card is in slot 7, formatted with a startup file, the computer chooses this device rather than the disc drives in slot 6. If the card is in a lower slot than the disc drives, the computer will start up from the program disc in slot 6, drive 1.

Alternatively, you can type PR#n from the Basic prompt where n is the number of the slot containing the ram card. If you get the message "UNABLE TO START UP FROM MEMORY CARD" it means that you forgot to format the card before copying the program files on to it.

The manual for the memory expansion card is produced in the usual Apple style. At first sight it seems quite substantial but only 19 of the 90 pages are in English – the remaining pages give similar instructions in French, German, Italian and Spanish. Many users may find the manual adequte, but programmers and technical experts may be disappointed with it.

By contrast, the manual for RamFactor has 43 pages including 11 pages of information for programmers and software developers. The main shortcoming is that the spiral binder is too small for the number of pages so it is awkward to turn the pages over.

The RamFactor card itself is slightly longer than the Apple memory expansion card but it fits quite easily into any of the slots. In many respects, the RamFactor card functions like the Apple memory expansion card.

It is recognised by AppleWorks 1.3, it gives the same desktop sizes and can be used as a ram disc. It is automatically formatted by Prodos and Pascal 1.3 but not by Dos 3.3 and is available in sizes from 256k to 1024k.

Advantages

But RamFactor also has some important advantages over the Apple card. First, it comes with a program on disc for adapting AppleWorks to give up to 5,100 records in a database file, up to 5,100 lines in a word processor file, but with the clipboard still limited to 250 lines.

This program also offers multiple disc saving capability, so if you create a file that is too big to fit on a disc it is automatically segmented to fit on two or more discs.

I loaded in a word processor file of about 2,400 characters in 54 lines and copied it until I had 93 pages of 5022 lines. However, when I tried to calculate the page breaks with Open-Apple K, it told me that word processor files are limited to 5,100 lines.

This is because the page break adds another line to each page so 93 pages of 55 lines would have been 5,115 lines. I cut the file down to 92 pages and had no problem with calculating the page breaks.

According to AppleWorks, the size of this file was 266k. I could flip from the beginning to the end instantly with the Open-Apple 1 and Open-Apple 9 commands.

However the Open-Apple R command took 20 minutes to find and replace a word that occurred 1,564 times. This is over 1 second per word, whereas in a shorter file the same operation took only 30 seconds to find and replace a word that occurred 170 times.

Large word processor files can be unwieldy even with the best of programs. Even if you are writing a book it is better to split it into shorter files which are easier to handle. You can easily copy or move paragraphs between files and print a series of files with consecutive page numbers.

Next I tried out a database by cutting and pasting a file with 500 records until I had 5,000 records. I then sorted the file into alphabetical or numerical order on various columns and found that this took between 30 and 150 seconds.

File handling

The Find command took only a few seconds to find all the records containing a given word. The Select command took no more than 14 seconds to extract all the records matching three criteria.

If you want a fast database, this must be the answer. Surely no program that holds records on a hard disc, let alone on floppies, can match the expanded AppleWorks for speed.

As for the spreadsheet, I created a file with over 90,000 cells with still some memory to spare. I can't think why anyone would need a file as big as this but the facility is there if you want it. Recalculating a large file can take several minutes and copying or moving many cells can also be slow. However, these operations can be speeded up with an accelerator card.

But the advantage of a big desktop is not just that you can create large files. Rather it is that you can have up to 12 files in memory and switch instantly between them. It is a pity that Apple did not offer more ram in the Apple IIe when AppleWorks first came on the scene. Had they done so, they could have gained much of the market that went to the IBM PC and Lotus 1-2-3.

Another advantage of the RamFactor card is that if you have a suitable Prodos clock card in any slot, the patched version of AppleWorks displays the date and time near the bottom right hand corner of the screen. The current date or time can be automatically entered into a database category by typing the @ character as the only entry. The category name must include the word date or time but not both. This facility did not work with my Glanmire Prodos clock which plugs into the games port.

The AppleWorks adaptation program offers another option to load the AppleWorks program automatically into the card. The program then runs faster because it does not need to access the floppy disc except for printing. This version of the AppleWorks program takes about a minute longer to start up but that time will be more than saved later by eliminating disc accessing.

The Apple method of loading the AppleWorks files into the ram card gives smaller desktop sizes but the RamFactor adapted AppleWorks leaves the desktop size apparently unchanged. This is not magic. What happens is that the AppleWorks special functions are "hidden" in an unused portion of desktop memory.

As the files on the desktop grow larger, some of the special functions are dropped from memory to make room for them. If the dropped functions are then needed, the program will refer to the AppleWorks program disc or ask for it to be inserted in a drive.

With AppleWorks autoloaded into RamFactor you could manage with only one disc drive for a file disc. In practice, most people who are likely to buy RamFactor probably already have two disc drives.

Last but not least, the AppleWorks adaptation program supplied with RamFactor offers an option to adapt AppleWorks 1.3 for an Apple II Plus. It needs a 16k card or a TransWarp accelerator or similar card in slot 0, and a Videx compatible 80 column card in slot 3.

Since the Apple II Plus does not have the Open-and solid-Apple keys, these functions are emulated by pressing the Escape key followed by another key such as A, E, O, P, S and so on. The action of the up and down arrow is simulated with Control K and Control J, the tab key with Control I.

The extra characters of the Apple IIe are generated by pressing Escape followed by an appropriate key, for example Escape < and Escape > give { and }. Lower case is obtained by using Control A as a toggle switch. Alternatively, a wire between pin 24 of the keyboard encoder connector and pin 4 of the games port enables the shift key to be used to give upper or lower case.

If, in comparison with the Apple memory expansion card, RamFactor offered only the extra features of AppleWorks, it would be enough. But there's more, much more.

Utilities

On the disc that holds the AppleWorks adaptation program there is a Basic utility program called Autocopy2 which allows you to copy all the files on one or more floppy discs to the ram disc. This needs some elementary knowledge of Prodos commands and pathnames but it is quite easy to use.

You can customise the Autocopy2 program to load your favourite programs into the ram disc automatically. Some copy protected programs can be copied on to the ram disc but may require the master disc in drive 1.

The RamFactor disc also holds a copy of

the Apple File program for formatting the ram disc and for copying files.

Perhaps the most vital difference between the Apple memory expansion card and RamFactor is that the latter can be partitioned to give up to 8 separate work areas. The RamFactor Partition Manager (RPM) program is permanently stored in rom on the card.

To access it, you simply type PR#n from the Basic prompt. If the ram disc is already formatted, this will cause the computer to boot the ram disc instead of the RPM program. If so, you must either turn the computer off for five seconds or, from the Basic prompt, type CALL-151, press Return then type Cn10G and press Return.

The RPM program displays a menu listing up to 8 partitions with the current partition highlighted. The arrow keys can be used to select one of the 8 areas while pressing S allows you to change the size of the highlighted partition. A partition set under Prodos or Pascal 1.3 can be any size within the overall limits of the size of the ram card. Dos 3.3 partitions must be either one or two 140k volumes or one or two 400k volumes.

Pressing N allows you to name the highlighted partition with a name of up to 16 characters. The name has no significance except as a label for your convenience. Pressing C allows you to clear a partition.

To boot from the active partition, the area must contain a bootable operating system and any required startup files. You can press either Return to boot the highlighted partition, or the number of the partition you wish to boot. If the partition is not bootable, RPM will prompt for the slot number of your boot drive.

To enter a different partition, you must reboot the RPM (PR#n) and select another partition to boot. This is comparable with taking a disc out of a drive and replacing it with another bootable disc.

Files cannot be transferred directly from one partition to another. Any attempt to access or format a partition formatted under an operating system different from the one currently in memory will result in a WRITE PROTECTED error message.

Like the Apple memory expansion card, if the RamFactor card is in slot 7 and formatted, it will boot with Open-Apple Control Reset. But if you have two or more partitions in RamFactor with AppleWorks in the first partition (where it must be in order to create a desktop), it is difficult to access the other partitions once you have started AppleWorks. I understand that it can be done with the aid of the Pinpoint ram enhancement kit.

Both the Apple memory expansion card and the RamFactor card have a built-in program to test the ram and other circuitry on the card. This test erases any information on the card.

Which card?

But if you are thinking of expanding your Apple II, should you choose the Apple memory expansion card or the RamFactor card?

Although the two cards are similar in many respects, the RamFactor card is better because of the software on disc and the ability to partition the card. What is more, it costs less. At the time of writing, the price of a 256k Apple memory expansion card is £245 whereas a 256k RamFactor card is £239. A 1024k Apple card costs £410, a 1024k Ramfactor card £369. Alternatively, Cirtech's Flipper costs £350.

Another advantage of the RamFactor card is that it has an expansion port for interfacing with Applied Engineering's 65C816 card. This is a 16 bit card with the same processor as the new Apple IIGS. At the time of writing no details were available but presumably it will enable the Apple IIe to run Apple IIGS software.

Alternatively, especially if you do not already have an enhanced 80 column card, you could consider the types of card that fit in the ancilliary slot. The latest version of RamWorks offers improved facilities such as up to 15,000 records in an AppleWorks database file, up to 15,000 lines in a word processor file and up to 2,000 lines on the clipboard. It also offers a printer buffer for AppleWorks with the Super Serial card.

MultiRam offers up to 5,350 records in an AppleWorks database file, and up to 2,250 lines in an AppleWorks word processor file but the clipboard is not expanded beyond the normal 250 lines. It does not seem to offer a printer buffer. However, it costs less than RamWorks.

Both RamWorks and MultiRam can be used as ram discs. Special programs are supplied to make them easy to use.

Product: RamFactor and MultiRam cards
Supplier: Bidmuthin Technologies, PO Box 264, Harrow, Middlesex HA3 9AY.
Tel: 01-907 8516, or from your local dealer.
Price: See text for details. □

Appletip

This small routine takes advantage of Max Parrot's graphic dump routine for the Imagewriter II Super Serial Card combination (*Apple User*, September 1985) to print out copies of the high resolution screen.

As anyone who has used this routine to print out a large number of normal-sized graphics will know, it can be rather wasteful in paper. This routine is split into two parts, one printing on the left half of the paper, the other on the right, allowing two graphics to span the width of the paper.

The first part of the routine selects the printer in slot 1, selects the unidirectional printing – the graphics look marginally better – calls the graphic dump routine and returns to the screen and the user.

The second part of the routine selects the printer and unidirectional printing and then winds the paper back to the start, sets the left margin to the middle of the page, calls the graphic dump routine, resets the margin to original values and goes back to screen and user.

Obviously the Call parameters in lines 1070 and 1170 can be changed, but there is not much point in printing double width graphics with this routine.

To use it you should GOSUB 1050 and 1120 alternatively, replacing the graphic on the screen after each one is printed out, or perhaps have one on page 1, the other on page 2 and amend line 1170 accordingly.

D.J. Masters

```
 999  REM Two-Print for
   ImageWriter II
1000  REM Copyright D.J.
   Masters 1986
1010  REM Start at 1050 for
   left col.
1020  REM Start at 1120 for
   right col.
1030 :
1040 :
1050  PRINT  CHR$ (4);
   "PR#1": REM Printer in
   slot 1
1060  PRINT  CHR$ (27); CHR$
   (62): REM Unidirectional
1070  CALL 38010,I
1080  PRINT : PRINT
1090  PRINT  CHR$ (4);
   "PR#0": REM Back to
   screen
1100  RETURN
1110 :
1120  PRINT  CHR$ (4);
   "PR#1"
1130  PRINT  CHR$ (27); CHR$
   (62): REM Unidirectional
1140  FOR I = 0 TO 20: PRINT
   CHR$ (27); CHR$ (114):
   NEXT I: REM Back up..
1150  PRINT  CHR$ (27); CHR$
   (102): REM Forward from
   now on
1160  PRINT  CHR$ (27); CHR$
   (76);0;4;7: REM Set left
   margin
1170  CALL 38010,I
1180  PRINT  CHR$ (27); CHR$
   (76);0;0;0: REM Unset
   left margin
1190  PRINT
1200  PRINT  CHR$ (4);
   "PR#0": REM Back to
   screen
1210  RETURN
```

Resurrection of a dead mouse

Mike Cook performs a minor miracle when his Macintosh's resident rodent turned up its toes

THE Macintosh is a powerful computer but it has its Achilles heel, namely the mouse. While it is true that this little rodent has revolutionised the user interface to the computer it is also vulnerable, and if it breaks the whole computer is useless.

Mine met an untimely end at the hands of my number two son, Graham (13 months). He had seen his older brother Alec (4.5 years) play very competently with it. One day he managed to reach up and grab the mouse, breaking the wire inside the cable that connects to the mouse button.

You can't get a spare cable (or anything else except a ball) for your mouse. Undaunted I replaced the whole of the cable, but unfortunately the replacement was much stiffer and sometimes moved the mouse rather than vice versa.

Never mind, I thought, it still works and I'll keep Graham away from it. Only a few weeks later the mouse was the object of his attention again so I placed it on top of the Macintosh out of his reach.

Cooked to a turn

There it remained for a few hours over the hottest part of the ventilation slots. This proved too much for the poor rodent which was found to be dead on attempted re-use.

The problem was it would go up and down but not side to side. This pointed to one of the optical switches, and I knew I couldn't get a replacement for that.

Sadly I phoned around all the Apple dealers within about 50 miles and discovered that there was not a mouse to be had. It would have to be ordered from Apple and would take three weeks.

A mild panic seized me, rather like an alcoholic being sent for a year to Saudi Arabia with only one bottle of whisky. I was all right for the moment but I knew that severe withdrawal symptoms would set in if I was separated from my Macintosh for that long.

I believe the first signs are the wearing of a tie followed by the purchase of a blue suit and finally irreversible brain damage. I was not going to risk these symptoms becoming irreversible; I had to act.

Casting around my stock of computers and hardware I came across an Atari Track Ball that I had interfaced to a BBC Micro some time ago. I remembered saying at the time that a track ball was just a dead mouse, so I set about making it a temporary replacement for my rodent until the new one was delivered.

A track ball is simply a mouse on its back. The ball is moved directly instead of moving the whole box. This has the advantage of using less desk space than the mouse and also imparts a totally different feel to the graphical input device. Some people prefer the feel of a track ball to a mouse, others don't.

Most track balls and mice work by translating the motion of the ball into rotation of slotted discs which are used to interrupt a light beam.

As the disc rotates the beam is interrupted and produces a series of pulses at a light detector. This system is shown in Figure I. To identify the direction the disc is rotating we use two detectors, so arranged that the slots do not pass the detectors at the same time.

You can see what I mean if you look at Figure II. Detector A is uncovered just before B when the movement is clockwise, but B is uncovered before A when the movement is anti-clockwise. This means that the pulses from detector A are out of phase with those from B.

Out of phase

We say that the two signals are out of phase by 90°, this is because we view one cycle of a waveform as being equivalent to one cycle or rotation. As a whole cycle of rotation is 360° one quarter of a cycle is 90°. You can see the two signals produced in Figure III.

If we take one signal as our standard we can say the other signal lags by 90° for clockwise rotation and leads by 90° for anti-clockwise rotation. So in order to see which way our mouse is going we determine

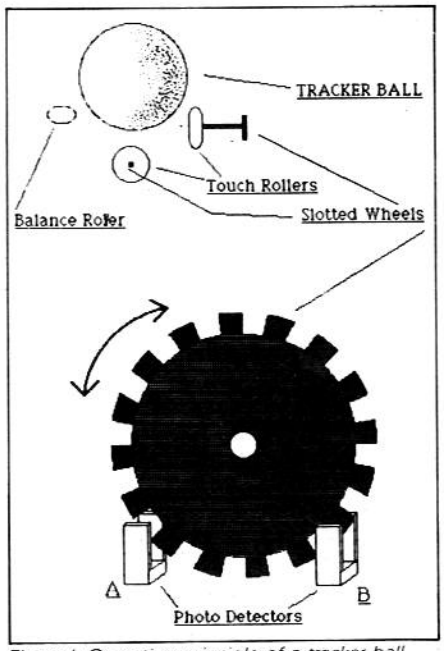

Figure I: Operating principle of a tracker ball

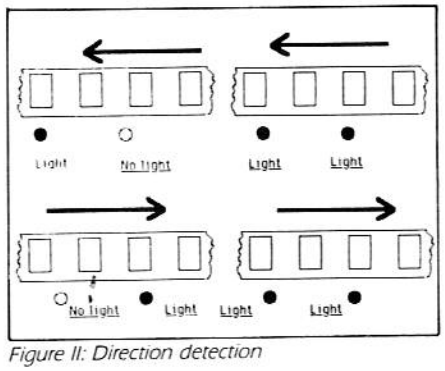

Figure II: Direction detection

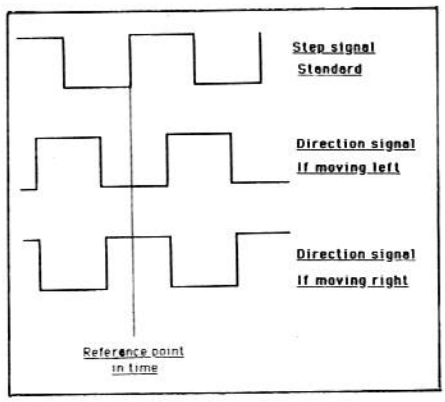

Figure III: The signals produced

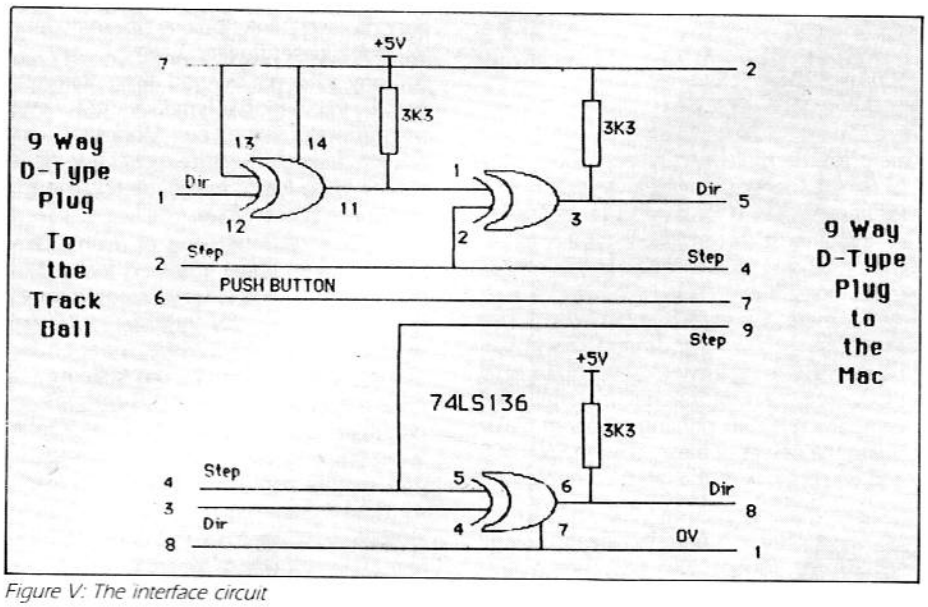

Figure V: The interface circuit

whether we have a lagging or leading signal.

We can do this in hardware, and this is the approach taken in the Atari track ball. If we use one signal to trigger a latch on its rising edge we can sample the other signal with the latch. Thus the output of the latch will always be high or low depending upon the direction of motion. This is shown in Figure III.

A latch, by the way, is a circuit that takes a snapshot of a logic line. When it is triggered by a transition from logic zero to logic one on its clock input, whatever logic level is on its data input at that instant is transferred to its output.

Output of latches are inevitably labelled Q, for no adequately explained reason. The outputs produced by such an arrangement give you a step (movement has taken place) and a direction signal.

I thought that to use an Atari track ball as a replacement for the Macintosh mouse would be simple. What the software has to do with the two signals is very similar to what the hardware latch does.

What happens is that on the rising edge of the reference signal an interrupt is generated. The interrupt service routine then looks at the other signal at that instant to find out in which direction the mouse is going.

Therefore it does not matter that the direction signal is not pulsing as it is only sampled at the instant the step signal makes a transition.

This means that the signals should be directly compatible if we can get them from the track ball into the user port on the same pins as those used by the Macintosh mouse. The pinout of the track ball is shown in Figure IV.

It turned out not to be quite that simple, because in the Macintosh an interrupt is generated on the rising and falling edge of the step signal. The software therefore expects that for any given direction the direction signal will be inverted on one of the edges.

What happens if you just connect the track ball is that the Macintosh thinks you have made one step forward and one step back. Spin the track ball as much as you like, it just shudders slightly.

To make the system work properly we need to invert the state of the direction signal every time the step signal is high and leave it unchanged every time it is low.

Once an interrupt has been generated it takes the computer several micro seconds to respond to it and sample the direction signal and we can use this delay to switch our direction signal.

An Exclusive OR gate can be thought of as a selective inverter. That is, the output will be the same as one input of the gate or the inverse, depending upon the state of the other input.

She was only a logic designer's daughter but she wasn't an Exclusive OR.

This is just the sort of processing we need to make the Atari track ball work with the Macintosh.

Figure V shows the final circuit. As you can see, the direction signal is inverted or not depending upon the state of the step pulse.

The up/down direction signal is upside down to begin with so it needs to be inverted before we start. The 74LS136 has four Exclusive OR gates which is fine because we only need three. However, these gates are of the open collector type so they need a pull up resistor to work properly.

I was going to lay it out on a printed circuit board but the PCB mounting 9 way D-type plugs will not fit in the back of the Macintosh because the board fouls the case, so you can't plug it in. So I made the circuit up on a small piece of vero board with one flying lead and plug going to the Macintosh and a lead and socket to the Atari track ball.

It was a little strange getting used to using the track ball, I found that dragging (movement with the mouse button down) required two hands. Some programs like MacWrite were virtually unaffected by using the track ball.

However I did find that the track ball gave me finer control for some delicate manoeuvres in MacPaint. Nevertheless the main thing was that my Mac was usable until my new mouse was delivered. □

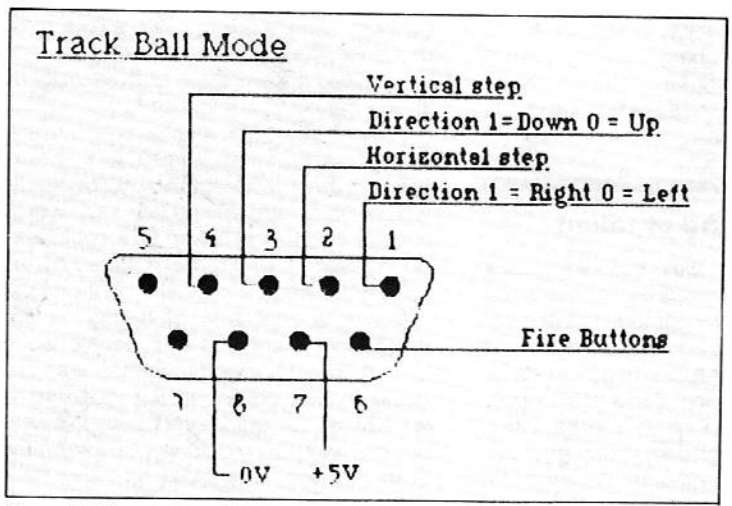

Figure IV: Pinout of track ball

Bill Hill visits the Scottish firm that is an integral part of the worldwide desktop publishing scene

From the traditional to the revolutionary

DESKTOP Publishing is the fastest-growing area of business computing today. In the UK, one firm has become associated, more than any other, with new developments in DTP – McQueen.

That association has been further strengthened by recent announcements that McQueen has now set up a new joint UK company within Aldus Corporation of Seattle, and has also won the contracts to produce Aldus PageMaker and Adobe typefonts for the whole of Europe.

McQueen is already European manufacturer of Aldus PageMaker and Adobe typefonts, distributors for Radius A4 screens for the Macintosh, and many other associated pieces of hardware and software. The company has by now built up unrivalled experience in providing DTP solutions for business.

To understand why a relatively small Scottish firm, based in the Borders town of Galashiels, should have gained such national, even international clout, you have to look at McQueen's recent and past history, which made it ideally placed to grasp the opportunities offered by the new publishing technology.

McQueen's background is in traditional printing. Its origins can be traced back to the Galashiels printers and stationers, Craighead Bros, which was established in 1845. A surprising if little known fact is that the company prints and manufactures all the shooting targets used by the British Army. This association with targets goes back to the last century, and McQueen targets are now in use all over the world, in countries such as Oman, Scandinavia, and so on.

This target business has also been developed in recent years into highly-specialised areas; for example, McQueen now manufactures a special range of targets designed for training police forces and other groups in anti-terrorist tactics. These targets are in use by, among others, certain British special forces units.

Alongside this target printing business, McQueen has also developed more conventional printwork, such as the production of promotional material. The company has two printing plants in Galashiels; the newer of these, costing £600,000 and equipped with the latest computerised presses, was opened just over a year ago.

While printing is the company's traditional background, it has in recent years diversified into a number of other areas, the most important from the DTP point of view being the sale and support of computer hardware and software.

In 1976 the company, which had hitherto been a family business, was taken over by the Gray family. Brothers Derek and Mike have been the major factor in the success of recent years. Mike, McQueen group chairman, has been more involved with the print side of the company's business, while Derek, the managing director, was more involved in the McQueen Systems division.

A gathering of talent

McQueen Systems was built up into a highly-successful dealership, associated with Apple and other computer systems.

Around two years ago many elements of the DTP industry of today began to come together and coalesce. For a start, Apple was far-sighted enough to see the possibilities of high-standard laser printing, allied to the superb graphics capabilities it was developing in the Macintosh.

At Adobe Systems in California, the PostScript page description language – often described as the "glue that binds DTP together" – was being developed. PostScript would offer users the ability to access not only laser printer quality typesetting, but also full typeset quality.

Many other players had also entered the game – International Typeface Corporation, Mergenthaler, Linotype, Monotype, and others – some of the most significant names to be found in the printing industry anywhere in the world.

It was a real gathering of talent, ideas, and power. Yet few observers realised the true significance of what was going on. On the far side of the Atlantic Jonathan Seybold, producer of the independent Seybold Report on Publishing Systems, was one. Seybold wrote at length on the potential of the Macintosh as a graphics workstation which could bring typesetting and quality printing within the reach of most business users.

Apple was listening and quietly funding research, working to help ideas and concepts to gel. At this stage though, most other manufacturers were still largely unaware of the undercurrent of DTP.

On this side of the Atlantic, apart from the people in Apple UK who obviously knew what was happening, and some other companies like Linotype and Monotype, DeskTop Publishing – as envisaged by people like Paul Brainerd of Aldus Corporation – was not even a twinkle in anyone's eye.

Derek and Mike Gray though, through their long associations with Apple and the printing industry, were already alive to the enormous potential of what was coming, and decided to make major efforts to become involved in DTP.

McQueen, they felt, was ideally placed for the market. With a long history of traditional printing methods, modernised and upgraded over the years to stay abreast of innovation, the Galashiels print division was aware of every aspect of the complex process of producing final printed material, from copy and graphics creation, through page layout, the production of artwork, and esoteric areas like colour separation.

Alongside it, the Edinburgh-based systems division was not only expert in business computing, but was also a main dealer for Apple, which it was clear by then would lead – in fact, establish virtually by itself – the new DTP industry.

In addition to the many technical and interfacing problems which DTP would present, there was another major hurdle which Derek and Mike Gray saw would have to be cleared before DTP could take off in Britain. It had to be accepted by the country's extremely powerful print unions.

It was a clear case of having to win hearts and minds and take people along with them. Union intransigence was not going to help anyone in the longer term, least of all the unions themselves. It was obvious that DTP could not be prevented from growing at a rapid rate. The only question was whether the unions could be convinced that it was more in the interests

of their members to cooperate with the changes which were going to take place anyway.

For the unions, it was a choice between the bold step of jumping on a by now rolling bandwagon, flying in the face of the instinctive desire to protect members' work in the short term, or being run over by it as businesses turned more and more to DTP to generate artwork and then took it to any of the growing number of fast print franchises to have it printed.

A hold-up here could have had grave consequences for DTP in the UK and for the printing industry as a whole.

An important factor in solving the problem was the far-sightedness of some of the Scottish officials of SOGAT, one of the major print industry unions. SOGAT's Scottish officials, talking with the employers organisation, the Society of Master Printers of Scotland, and McQueen's, signed a watershed agreement on DTP and the handling, by SOGAT members in the print industry, of DTP-generated artwork.

It could have been understood if SOGAT had adopted an entrenched position during these crucial talks. After all, technological innovation and change in the printing industry had already meant the loss of thousands of traditional jobs.

But McQueen, through Mike Gray, offered the strong probability that accepting DTP would mean that at least one new technology could create additional jobs. The argument ran thus. Many companies would like to put out professionally-printed material, if only they could afford it. DTP would dramatically cut the costs of producing their artwork, and the result would be more work at the production end of the print cycle.

The unions accepted the hypothesis, and agreed to let McQueen serve as a testbed for DTP developments.

The theory has since been proved to be true. McQueen has grown considerably as a result of its work in and with DTP, and its workforce has gone from 55 to 85 people, employed both in Galashiels and Edinburgh.

Mike Gray told *Apple User* that McQueen spotted the potential of DTP about two years ago, when the first true DTP electronic page makeup software began to appear for the Macintosh.

On one hand, the print division began working on its "interface" with DTP-produced material, for example, setting up the machinery whereby users would send in Macintosh discs to have their work output on Linotype typesetters.

At the same time McQueen's systems division evaluated software systems and did some hard lobbying in the USA to tie up UK distribution rights for the leading software package, PageMaker, produced by the Seattle-based Aldus Corporation.

It also became the European distributors for the range of DTP typefaces produced by Adobe Systems.

The result of these deals was that McQueen's set up its own distribution division in March of this year – and turnover is likely to hit over £1.5 million in its first year.

First step in creating a typeset page using Pagemaker

Derek Gray

The first fully-functional DTP systems were based on Apple Computers. But within the next few months PageMaker will also become available running on the IBM personal computer, the unquestioned market leader in the business world. McQueen's also has UK distribution rights for the IBM version.

An Apple-based DTP system, supplied by McQueen's and Apple UK, was loaned to a team of journalism students and lecturers from Napier College in Edinburgh, who used it to produce a daily newspaper for athletes and others taking part in the Commonwealth Games.

"We found that by becoming involved in DTP, we were able to bring our computer knowledge, marketing knowledge and printing knowledge together", Mike Gray told *Apple User*.

"Now we are ahead of the field, and in addition to being distributors of these products, we have now acquired manufacturing rights for PageMaker and Abode typefaces, which will mean more work and greater benefits here in Scotland. The cash value of this work in a year could be between £500,000 and £1 million".

McQueen is also UK distributor for the A4 Radius screen for the Macintosh, seen at the recent AppleWorld exhibition in London, as well as the Microtek scanner, which allows users to turn artwork and photographs into digital images which can them be placed into DeskTop publications.

McQUEEN, the Galashiels-based UK distributors for Aldus PageMaker DeskTop Publishing software, has set up a new British company, Aldus UK Ltd, in conjunction with Aldus Corporation of Seattle.

The new company, based at Craigcrook Castle in Edinburgh, will be responsible for UK and Eire sales and support for the PageMaker product. McQueen also announced this month that it has won the contract to manufacture PageMaker, and all Adobe typefaces, for the whole of Europe. This work is estimated to be worth between £500,000 and £1 million in a full year.

The products will be manufactured at the company's extensive Galashiels print works.

The setting-up of the new Aldus UK is a logical step for both McQueen and Aldus, since support and training will become even more important with the arrival of PageMaker on the IBM PC and compatibles, as well as version 2.0 of PageMaker for the Macintosh, which will have many advanced features.

Aldus UK will be responsible for hot line and other technical support for PageMaker dealers and end users who subscribe to a new extended support scheme to be announced early next

Future plans

Looking towards the future, Mike told *Apple User* that he saw scanners like the Microtek developing into the optical character reader marketplace, as well developing into systems which would allow them to be used as fax machines in conjunction with the Macintosh.

"On the software side, we are looking at packages like Pro-3D, a three-dimensional drawing package which creates a PostScript drawing file, so users can go up to the print quality of a Linotronic if they want. We are also looking at MacTex, a program designed for high quality production of large publications, although much more complicated to use than, say, PageMaker.

McQueen, through its contracts, is now in close contact with DTP developments in the USA by groups like Adobe Systems, and Mike is also aware of developments taking place in areas such as turning scanned images into PostScript files which can then be manipulated; and moves towards systems which will allow full four colour artwork to be produced on a Macintosh, including full colour separation work!

"Our general view is that DeskTop publishing systems, both hardware and software, are going to become more and more professionally orientated over the next year or two, and will offer increasing power and sophistication for the high-quality user", Mike added. □

The art of the States

Top American computer writer Steve Usdin with an update on desktop publishing's progress in its birthplace.

A TECHNOLOGICAL revolution is changing the way American businesses and individuals communicate.

Just as spreadsheets like VisiCalc brought new capabilities to owners of microcomputers and dramatically widened their penetration of the business community, the power of desktop publishing is pushing microcomputers, especially Macintosh's, into places previously populated by expensive mainframes or bored humans performing repetitive tasks. The American experience with desktop publishing is a prelude to UK developments.

The term desktop publishing covers a multitude of sins. The ability to merge text and graphics to produce a ducument that can be modified and stored electronically on a small system (one that fits on a desktop) is its essence.

Desktop publishing systems can be used to produce final product hard copy, to automate typesetting and paste-up'lay out procedures for offset duplication, or as front-ends for typesetting machines.

The Macintosh is extremely well-suited for desktop publishing. It is essentially an illustrated document maker, with graphics processing capabilities that far surpass those of IBM PCs.

Its central processor can handle images more readily than the PC's and its screen has higher resolution and a shape that allows text to be displayed just as it is printed – which is virtually impossible on a PC. Third party hardware and software has been developed that takes advantge of the machine's potential as the heart of a desktop publishing system.

In addition to the Macintosh itself there are several other elements of a desktop publishing setup: Printers, scanners, page composition software, graphics software and communications software and hardware.

Printers

The majority of desktop publishers print their products on laser printers. While it is possible to do almost everything described in this article with a dot matrix printer like the ImageWriter, the results will not be satisfactory for most applications.

There are three price and performance levels of laser printers. At the centre of the spectrum is Apple's LaserWriter, costing about $7,000 in the US.

Below this there are a host of laser printers costing about half as much, such as Hewlett-Packard's Laserjet and Canon's Cordata's and Ricoh's laser printers. At the top end there are sophisticated typesetting machines from Allied Linotype.

A powerful graphics language, PostScript, from Adobe Systems makes the LaserWriter and other Mac-compatible printers really sing.

PostScript is a whole story itself. It makes it possible to store in the printer a large number of high resolution fonts that stay sharp no matter what point size.

PostScript's design is also responsible for the speed at which LaserWriters can produce pages with mixed graphics and text. It supports kerning (altering the space between letters) and condensed, justified, italic, rotated and reversed text.

The LaserWriter is a PostScript-based laser printer that produces documents at a resolution of 300 dots per inch (dpi). John Scully describes the LaserWriter as "the most powerful computing machine Apple manufactures". It has as much computing power and memory as a Macintosh married to a Canon laser printing "engine" which is the guts of most low cost laser printers.

The LaserWriter is capable of producing full-page graphics at full resolution at speeds up to eight pages per minute – complex graphics slow it down.

LaserWriter clones are a recent development. The first of these machines is QMS's P8000. Its operation is virtually identical to the LaserWriter but it costs less. Watch out for more, cheaper, LaserWriter clones – and a drop in the LaserWriter's price to match.

Desktop publishers who already own a laser printer such as Hewlett-Packard's Laserjet or Laserjet Plus, can use them with their Mac's. These machines cost half what the LaserWriter does (or less) and give you about half the performance.

For starters, they can only print a third to a half a page of graphics and some of the best pagination software won't run on them. They require special software drivers, such as Laserstart for the H-P Laserjet.

Allied Linotype has a pair of Mac-driven typesetters, the Linotronic 100s and Linotronic 300. They produce documents with resolutions of 1270 dpi and 2540 dpi and cost about $30,000 and $50,000 respectively.

This sounds like a lot of money, but the combination of a Mac, Linotronic typesetter and associated software can out perform minicomputer-based systems costing three times as much.

Scanners and frame grabbers

Scanners digitise images. That is, they convert the contents of a sheet of paper containing text or graphics to a digital form that a computer can manipulate.

They are particularly useful in desktop publishing because they make it possible to enter a drawing or photograph into a Mac, modify it, and integrate it with text or other graphics. Frame grabbers do essentially the same thing with video inputs, usually from a regular home video camera.

Page compositions software

Three software packages that integrate text and graphics have been developed for the Macintosh in the last year. They all support PostScript and accept input from Mac word processors and graphics packages.

Aldus Software's PageMaker was the first program to take full advantage of the Mac's user interface and PostScript. It is the standard to which other page composition software is measured to the extent that PageMaker is frequently used as a generic term for page composition software.

With PageMaker pages can be drawn on the screen with a mouse and filled with text

from a standard Macintosh word processing file. Images from graphics programs can be introduced and lines and boxes can be drawn on the screen.

As elements are moved around copy reflows automatically to reflect changes. PageMaker does not automatically kern characters or hyphenate words. It sells for $500.

Boston Software Publishers' MacPublisher II ($195) provides a mouse-driven interface for drawing out pages and calling up text to fill them, much like PageMaker. It supports automatic kerning and letterspacing but does not provide automatic hyphenation.

Manhatten Graphics' Ready-Set-Go ($195) is similar to the other Mac page composition programs. Its drawbacks are limited file management and slow performance. Its advantage is that it lets users input copy directly on to the page in the proper size and style. It doesn't support automatic hyphenation.

Communications

Communication is important in desktop publishing because it allows exchange of data among Mac users in different locations and between Mac and non-Mac users. AppleTalk, Apple's Local Area Network (LAN) can integrate IBM PC's and one or more Mac's so that they can exchange data and share peripherals such as a laser printer.

Communications software and a modem allow Mac publishers to receive data, both formatted Mac files as well as unformatted Ascii files from virtually any computer, and manipulate them with page composition software. Modems also allow Macs to send data to typesetters.

Newspapers

American newspapers have adopted Macs for desktop publishing to a greater extent than any other industry. Half of US newspapers have Macs in their graphics departments. Four out of five newspapers responding to a recent survey indicated they plan to purchase a computer graphics system and most of these will probably end up with Macs.

Macs are found in the smallest papers, as well as at huge enterprises like United Press International.

Smaller newspapers usually use the Mac for a wide range of applications, from page composition and typesetting to accounting and database management. Larger papers tend to use Macs for specialised graphics tasks because they have other computers for more mundane chores and require higher resolution than the Mac can currently provide for typesetting.

The Elkton, Tennesse Standard with 1,750 subscribers is typical of small papers using Macs. Co-editors Mark Howell and Mike Finch write articles on two 512k Macs with Ready-Set-Go page composition software. Copy is printed on a LaserWriter, waxed and stuck on paste-up boards for offset printing.

"The nicest thing for us is that it gets us around the limitations of our Compugraphic typesetter, which doesn't have any kind of storage system", Finch says.

"With the Compugraphic, when you think, 'Gee, I'd like to have this in two columns', you've got to type it all over again. With the Macintosh, it's no problem to change.

"And it costs only about four cents a sheet to make changes, whereas it's 50 cents a linear foot with the typesetter paper".

Mailing

Finch originally bought the Mac to take care of his mailing labels. It sorts labels by carrier route and prints them on an ImageWriter. The subscriber database is maintained on OverVue database management software. The sorting capability saves his shoestring operation $8 a week and allows the paper to sell advertising inserts targeted at specific carrier routes.

"If advertisers want to know how much circulation we have in a particular area, we can just call it up", Finch explains. "Before, we never knew, because we would have had to go into the back and count labels by hand".

Finch has also found that the Mac cuts advertisement production times by 60 per cent over manual production. With Ready-Set-Go he can generate graphics that he used to have to purchase.

USA Today has pushed the American newspaper industry into Macintosh use, in self defence. When the nationwide newspaper started up four years ago, most newspapers hadn't changed their graphics production techniques much in a hundred years. Charts were hand drawn, thus being difficult and time consuming to alter, and maps were traced from atlases.

USA Today changed all that. With its massive graphics staff and sophisticated equipment it produced a stunning product, using colourful graphics, charts and maps that made other newspapers seem boring and old fashioned in comparison. The major papers have begun to fight back with Macs.

Newspapers use programs like Microsoft's Chart to view the same data in a variety of forms (for example, bar, pie and line graphs) in seconds and select the most effective presentation.

The Washington Times digitises images, edits them and gives the print outs to an artist who enhances them by adding colour and detail. It maintains a library of maps and images that can be called up on short notice to illustrate breaking news stories.

Knight-Ridder, owner of a large chain of newspapers, has set-up a graphics network. Images that one newspaper creates can be transmitted in seconds to papers around the country.

Graphics software

There is a lot of third party graphics software available for the Mac now, most of it based on MacPaint/MacDraw icons. While some representative packages are described below, there are scores of others of equal merit.

The range of graphics images available for the Mac makes it possible for individuals with little or no artistic ability to produce competently and even aesthetically illustrated documents.

The premier packages are Hayden Software's daVinci series of architectural design programs. Separate modules, such as buildings, Commercial interiors, and so, contain over 400 elements from which building plans can be drawn. Images can be scaled, copied and altered.

The most popular stock art program is T'Maker Graphics' ClickArt which includes four modules: Personal Graphics, Publications, Letters and Effects. Effects allows users to modify images and text on the screen – rotating or slanting it.

Fingertip Software sells 500 menu patterns for MacPaint that can be combined and altered. Kensington Microware produces Professional Type Fonts, a matching Headline set, and Graphic Accents (a collection of over 250 illustrations).

Newsletters

Newsletter production has been altered dramatically by the advent of desktop publishing. Overhead costs have been lowered and control over design has increased.

Stuart Learner, editor of the Neographic Society's newsletter in Washington says that "Macintoshes have qualitatively and quantitatively improved my whole operation. I can do more now with a smaller budget".

Learner produces a regular newsletter as well on-demand graphics for members. The production process begins with the coordination of contributions.

"I get manuscripts in various forms from contributors around the country and overseas", he explains. "Every morning I scan my electronic mailboxes on MCI Mail and the Source and download messages. People who send me stuff use all kinds of computers. It doesn't matter so long as their word processor can create an Ascii file.

"I also get articles on floppy discs, both Macintosh and IBM formats. The IBM files are transferred with a conversion utility".

Because the Neographic Newsletter is sent to graphics professionals, it is particularly important that its design is innovative. Lerner takes images from stock art books and other sources, digitises them on an Abaton scanner and merges them with text and click art to create what he calls "a seamless montage of pictures and words. The newsletter is a showcase for new ideas on the graphical presentation of information".

The Society has PageMaker running on a □

Colour Modulator + sound for //e	£30
PAL for use with colour TV for II	£42
RESOLUTION (80 col //e)	£19
RESOLUTION 64 (80 col+64K RAM) //e	£29
RESOLUTION 64+ (with DOS or CP/M RAM DISK) //e	£59
RESOLUTION 128 (80 col+128K RAM+DOS or CP/M RAM DISK) //e	£79
SCREEN 80 (80 col + softswitch) II	£39
AUTO-SCREEN 80 for II (Integrated softswitch)	£44
DMS C12 RGB for II or //e	£45

Rosco printer cards are CP/M, Pascal, DOS and ProDos compatible with full graphic dump facilities.

PARA-GRAPH printer card + cable	£30
GRAPPLER compatible + cable	£39
Grappler Buffer board (16K)	£30
Digitek Printmaster III	£49
CACHECARD 16 with cable	£50
CACHECARD 64 with cable	£60
Serial/Communication	£48
Serial Printer	£36
Digitek High Speed serial	£25
Keyzone serial printer	£24
Simon High Speed serial	£29

16K RAM CARD for II	£29
128K RAM CARD for II	£89
RESOLUTION 64+	£59
RESOLUTION 128	£79
MULTIRAM //e 256K	£169
MULTIRAM //e 512K	£209
MULTIRAM //e 768K	£239
MULTIRAM //e 256K	£229
MULTIRAM //e 512K	£259
MULTIRAM RGB 768K	£269
MULTIRAM RGB 1MB	£299
65C816 for //e	£154
65C816 for //c	£149

IEEE-488	£79
Clock Card (battery back-up)	£59
Z80 Circuit Emulator	£199
A to D (16 channel 8 bit)	£69
A to D/D to A (8 bit)	£85
I/O Card (4 ports/2 timers)	£59
IC Tester	£99
PAL Programmer Card	£299
Logic Analyser Card	£290
EPROM Writer upto 27256	£89
EPROM Writer upto 27512	£139

Z80 CP/M (II or //e)	£29
Disk Controller	£28
Speech Card (SAM)	£59

EPSON LX-86	£209
Tractor feed for above	£20
FX-800	£339
FX-1000	£454
EX-800	£399
LQ-800	£499
LQ-1000	£599
STAR NL-10 with parallel or Apple //c interface	£249
NL-10 Cut Sheet Feeder Powertype Daisywheel (18cps)	£229

Apple II compatible drive	£92
Apple //c compatible drive	£99

XEBEC Hard disks – Run DOS 3.3, ProDOS, CP/M & Pascal programs

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Some Apple /// and MAC software packages still available – Phone for details

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◁ 512k Mac and a LaserWriter. The LaserWriter's output is duplicated with a Kodak photocopier on to coloured stock.

The newsletter is produced by three full time artists. A much larger staff would be necessary to produce the newsletter manually – people to cut things out and paste them up, secretaries to key manuscripts into a word processor and a large team of artists to make the drawings and graphs.

Lerner figures that he saves $100 per page on typesetting and paste-up costs alone. And he "can turn the whole thing around in a day, working through the night if we have to". Because he controls the whole process from page composition to printing.

Macintosh publishing systems have penetrated all branches of government in Washington. Several Congressional offices use them to produce newsletters that are sent to consituents. And the Army uses Macs, as do a variety of "beltway bandits" (independent contractors with offices on the ring road around the capital).

In a move that is sure to catch on in the UK, the largest chain of photocopy shops in Washington offers Macintosh services to its customers. Computer workstations are situated next to the front windows, attracting the attention of passers-by.

Customers can rent time on Macintoshs to design stationary, brochures, flyers, menus, and so on. They keep their disc and can bring it back for edits as required. This kind of setup is great for businesses that have to send out price lists. The lists have to look good, but they change to rapidly for the delays involved in offset printing.

The first hour on the Macs is free. Enough time to learn the basics of the machine and a graphics program, the proprietors claim. Customers can also bring in their own discs. This is particularly convenient for Mac owners who haven't invested in a LaserWriter.

Documentation of technical products and services is another area well-suited to desktop publishing. Booz, Allen & Hamilton – a beltway bandit that has grown into an international management and technology consulting firm – uses Apple products to document its projects.

Booz has a graphics department with Macs, LaserWriters, scanners and a variety of page composition and graphics software. Technical writers and editors produce copy on IBM PC compatible computers and turn it over to the graphics department which converts it to Mac format, jazzes it up with graphics and prints it on the LaserWriter.

Conclusions

All the desktop applications described above will be automated in the UK in the coming years as they are in US. Lowering prices and increasingly sophisticated (easy to use) systems will drive desktop publishing into many other areas as well.

Things to look for in the near future include lower-priced high resolution (1000 to 2000 dpi) printers and a convergence of desktop publishing and electronic mail.

Softstrip: Paper-based software

Going back to paper?

A REVOLUTIONARY paper product that will enable the Apple desktop publishing system to benefit from low-cost font and icon software is soon to be launched.

The two companies involved – Softstrip International (UK) and Mecanorma – claim this will accelerate the growth of the DTP market.

Softstrip has only recently introduced into the UK a technology that allows programs and data to be encoded on paper in the form of a data strip. This can be read by a Macintosh using an electro-optical scanner.

Now Softstrip has teamed up with transfer lettering specialist Mecanorma to develop and market a paper-based font and icon software product for desktop publishing.

"Desktop publishing has taken over many areas that were once the preserve of the graphic designer", says Bob Travis, Mecanorma's managing director.

"We are a specialist supplier to the graphic design sector, which puts us in an excellent position to understand the requirements of the marketplace.

"A designer needs to be able to choose from a range of typefaces. Font software – on traditional magnetic media – is expensive, from around £45 for a single typeface.

"Using the Softstrip technology we should be able to bring an entire library of fonts and images well within the price range of most users.

"Furthermore, people will be able to create their own library, stored on paper rather than valuable disc".

The key to it all is the Softstrip technology. For this breakthrough enables software, data, graphics and even sound to be encoded on paper which can be fed into a Macintosh.

The Softstrip Reader, which plugs directly into the RS232C port, can read data recorded on paper in the form of a printed graphic pattern or data strip.

When the Reader is placed over the data strip, the internal reading "truck" moves down the length of the strip scanning the encoded information.

Scanning is performed using near infrared light so that problems associated with traditional magnetic media – such as fingerprints, creases or electronic interference – do not inhibit the reading process.

The Reader can scan a full length strip in about 30 seconds, then transmit data to the computer at a rate of 4800 baud.

Users can create data strips on their own dot-matrix or laser printers with the help of StripMaker, a proprietary Softstrip software package.

From one to ten files at a time can be selected and printed. If the program or data is lengthy, multiple strips are produced side by side up to eight per A4 page.

A 12-page, double-spaced document can be printed, using a LaserWriter, on four high-density data strips.

"Before we even launched the Softstrip technology in this country, we identified desktop publishing as one of the first application areas that it could benefit", says managing director Anton Boyes.

The Softstrip Reader is priced at £200, while an additional £20 is needed for the StripMaker program.

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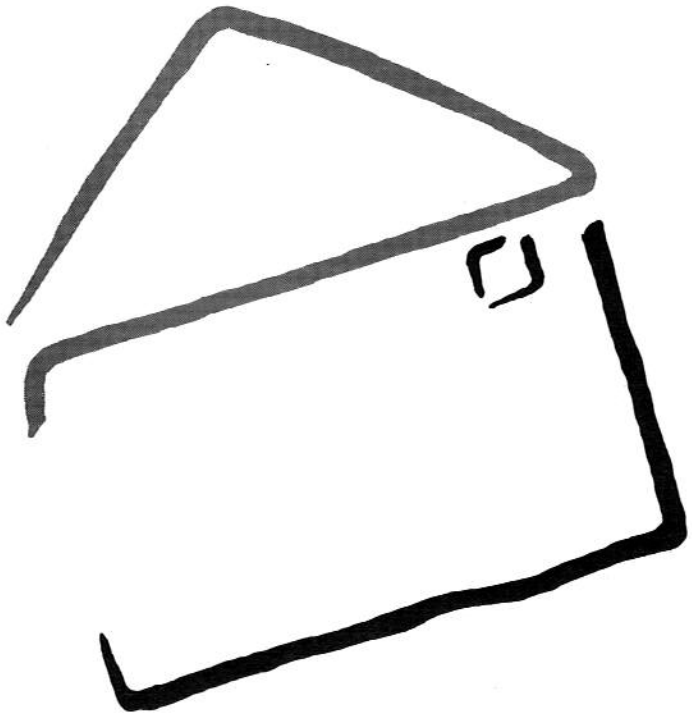

Sound sampling

I READ Mr Cowap's letter in the June issue of Apple User *concerning sound sampling on the Apple II, with some interest.*

In the winter 1984 issue of the late (but not lamented) Orchard Computing magazine there was a listing for an Applesoft program called Apple Talker which sampled via the cassette input port at the rate of 7,300 1-bit samples per second (which, on a 48k Apple, allows about 5 secs as I recall) and replays it through the Apple's internal speaker.

If anyone would like a copy of the program they can send me a blank disc and I shall save them a great deal of typing. But please include return P&P. – **Michael J Evans, 20 Kingsmead Walk, Speedwell, Bristol, Avon BS5 7RL.**

Slot machines

*FURTHER to your review of Fulltext 55/80 (*Apple User, *August 1986) readers with this software may be interested in the following information.*

Fulltext 55/80 normally only allows printers in slots 1 or 2. However, it can be redirected to any slot with a printer installed, which in my case was slot 4.

The printer slot number is stored at $0398. To change this printer location the slot number must be placed here. This can be done by the embedded command \.K0398,NN, where NN is the required slot number, in HEX.

Alternatively location $03B4 holds the maximum permissible slot number, and is usually set at $02. A poke here will allow the slot number to increase beyond the present limit of 2.

I've been in touch with the software company (Spacific Software, New Zealand) and these modifications are officially approved by them.

Finally, is there a peek on the IIe to find whether the shift-lock key is up or down? – **Fred Wright, Tyne and Wear.**

● Not as far as we know.

Best interest

THE review of Tom Weishaar's book Your Best Interest was sufficiently interesting to prompt me to obtain a copy.

However, two of the largest bookshops in Birmingham were unable to find this book listed for release in the UK. Your reviewer also failed to state the US publisher, which would have been useful. – **E.R.Langton, Brentwood.**

● It was my fault the product information was left off – not the reviewer's.

Your Best Interest is published by Infobooks of Santamonica, California, but it is probably easier to get it from Open Apple, PO Box 7651, Overland Park, Kansas 66207, USA.

The price is $9.95, but I don't know the cost of packing and post – **M.J. Parrott.**

Redefinition

CAN you help me with the following problem using CP/M?

I have an Apple IIc with a 512k Zram card fitted which I find remarkably good, especially using the ram disc as drive C with CP/M.

While the CP/M system supplied with Zram (CP/AM) is excellent I prefer to use the Microsoft CP/M 2.23, which is fine except for one thing.

WordStar version 3.31 will not operate with CP/M 2.23, in that when the program is run it is not possible to save a file or to exit in the normal way. The program runs perfectly under CP/AM.

Do you know of a patch to overcome this problem? – **Bruce Parry, Kuwait.**

● This sounds like the keyboard redefinition of CP/M 2.23 interfering with Control–K. Use CONFIGIO to remove all the redefinitions. The manual or our series on CP/M shows how to do this. – **M.J. Parrott.**

Off colour

I WOULD like to comment on the article on the IIGS or, more specifically, the photographs.

When Apple first started to make computers they coloured the case in the beige we are so familiar with.

Then they altered the colour to an off-white for the Lisa, Mac and IIc, which is the colour of the IIGS in the photos. However, the machine I saw had a grey case and I was told this was the new corporate colour of platinum.

The machine I saw was all in grey, including the RGB monitor and mouse. The keyboard was also grey with white keys, but the disc drives were the off-white of the IIc.

I was told by Apple that this grey colour, reminiscent of the ITT 2020, would be the colour of the IIGS and we had a short chat on this very point.

I thought and still think the grey is boring and is not the colour I would choose for a computer. They said that Apple had researched this and business prefers grey computers. They also said that Apple had no intention of making it in any other colour.

I prefer the off-white of the photos or even a silver-grey to platinum – it looks more like lead to me – and I would be interested to hear other opinions on this. – **Malcolm Whapshott, Farnham.**

Printer bugs

I READ your review of the Cirtech CP/M system. The current release 1.07 corrects a fault which I found in the printer driver routines and my version certainly works with Turbo Pascal.

The printer driver routines in releases 1.03 and 1.05 ignored Pascal 1.0 driver routines on printer cards and would only recognise Pascal 1.1 drier routines. My Simon printer card falls into the Pascal 1.0 category and consequently was ignored by the CP/M software.

After exhaustive inquiries I sent Cirtech a nasty letter and was surprised to receive one back informing me of their corrections ▷

◁ *and an offer to update my software.*

One final bug is that the original module I was supplied with failed to work in my Apple IIe. It seemed to overheat – it would work for 10 minutes then hang the keyboard. Rebooting had no effect.

However, turning off then resuming after allowing cooling time did work, but for a shorter period.

The module was returned to P&P Micros who performed a soaking test for me and could not duplicate the same problem. Consequently there must have been a timing fault between that particular module and my IIe. I am having no problems with its replacement.

I think your review gives the impression that the module runs at 8MHz. This is incorrect: Without fitting a IIe with faster memory the best speed one could expect is 4MHz, although Cirtech claims that an actual speed is nearer 5MHz because some instructions use Z80 registers – for example, DJNZ – and do not access memory for all of their cycle time.

A 5 MHz clock speed is adequate for the Turbo Pascal install program in any case. I do not have the programmers kit here but, according to Cirtech, this contains details such as precise timing.

The system clock itself is generated from the Apple IIe 7 MHz system clock, so the inserted wait states are bound to be confusing.— **Peter Ibbotson, London.**

Setup strings

IN answer to Mr P. Winward's question in Apple User June 1986 I have never used Visifile in the past, but years ago I used the first version of Visicalc where it is necessary to use the following substitutes in the print set-up string:

For Control use ~C (tilde+C).
For Escape use ~E (tilde+E),
or ~[(tilde+C+[),
or ~H27 (tilde+H+Escape
/Ascii value in decimal).

Therefore for my Epson FX-85 (which uses Control+O) I used the following setup string for condensed mode:

~ÊCO (<ESC><CTRL>O

It is also possible to use:

~C~CO (<CTRL>[<CTRL>O

or:

~H27~H15 (\$27 \$15)

I hope that Mr Winward will now be able to produce small print on his Apple DMP. – **Jaromir Smejic, Prague.**

In desperation

PRODOS and AppleWorks will not my work on Apple. They just shut down. I can't find anything wrong with it, but the programs work fine on other Apples.

My machine is an Apple '78 with normal Applesoft roms from 1981 (Dos 3.3), dual 35 single/40 double disc drives, Z-80, speech, language (16k), 80 column and RGB cards, this last linked to a Philips colour monitor.

The Prodos disc always ends at the following address:

0914–A=0C X=60 Y=02 P=34 S=F7

Does this mean anything? – **Tom Verheijen, The Netherlands.**

● It sounds to me that there is either a problem with your language card or there is a conflict with one of your other cards. You could try removing all the cards bar the language, and if it works add each one back in turn to find the faulty combination. Remember to switch off before inserting the remaining cards. – **M.J. Parrott.**

Internal Entry

I WOULD be grateful for some information on the Apple IIe Applesoft's internal entry points. My priority is accessing the internal maths routines resident in memory.

If you have covered this subject in the past could you quote me the relevant edition numbers, or could you recommend some books on the subject? – **Pauline Nyhan, Cork, Ireland.**

● I have not seen much information about the new, enhanced roms and the old information is scattered through our literature.

The most comprehensive was given by John Crossley in The Apple Orchard, March/April 1980. Also The Master Assembler from Southwestern Data comes with a source listing of Applesoft on disc.

What's Where in the Apple IIe by W.F.Lambert (Micro Ink, Massachusetts) lists some entry points but not how to use them.

Remember that extensive floating point calculation will not be particularly faster in machine code than in Basic because time spent interpreting becomes relatively less important if a lot of calculation is going on.

The book Apple Numerics Manual from Addison-Wesley may be helpful – I have not seen it myself. – **M.J.Parrott.**

Date handling

OVER the past few years I have read with some interest the various solutions you have published to the apparently perennial problem of handling dates.

I have used the following algorithm for several years, mainly in order to simplify the task of sorting a file into date order.

The program accepts a date in the form ddmmyy and then converts it into a number of days since January 1, 1901. (January 1, 1901 is day 1, January 2, 1901 is day 2, January 1, 1902 is day 366 and so on.)

The program is valid for all dates from January 1, 1901 to December 31, 2099, which should be adequate for the majority of users.

The following program segments are involved:

Initial set-up:

```
10 DIM M(12)
20 FOR I=1 TO 12
30 READ M(I)
40 NEXT I
50 DATA 0,31,  59,90,120,151,181,212,242,273,304,334
```

This section need be executed only once in order to initialise array M to the value of the number of days elapsed up to the beginning of a particular month. For example, element two contains the number 31, the number of days elapsed up to the beginning of February.

Data entry:

```
60 INPUT "DAY ";D1
70 INPUT "MONTH ";M1
80 INPUT "YEAR ";Y1
```

This section needs no explanation, other than to say the year is entered as yy. Of course it can be altered to suit a particular application.

Date conversion:

```
90  LET D=INT(Y1—1)*365.25)+M(M1)+D1   100 IF
INT(Y1/4)=Y1/4 AND M1>2 THEN LET D=D+1
```

When a date is required to be converted only these two lines need be executed. The former does the bulk of the conversion work, the number of years being multiplied by 365.25, the extra 0.25 accounting for leap years gone by. For example, in the year 1911 the calculation would be:

```
INT((11—1)*365.25)
=INT(10*365.25)
=INT(3652.5) =3652 (=10 * 365 +2)
```

the extra two leap years passed (1904 and 1908) thus being accounted for.

The remainder of the first line then adds the number of days elapsed up to the beginning of the current month and finally adds the days elapsed in the current month.

The second line of the two simply adds 1 to the final total if the current year is a leap year and the date has passed February. – **John Brass (Lecturer in Computer Science, Hartlepool College of F.E.**

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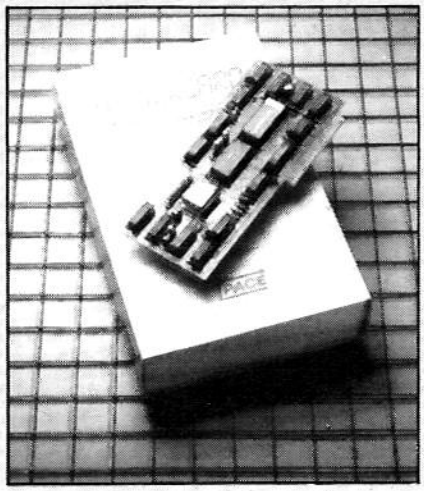

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January 1985

John Sculley's View of 1985 – Games (Gelfling Adventure, Story Maker, Stellar 7) – Application: Apples down on the Farm – Cloze Technique (Plus review of Clozemaster) – World of the 6809 Part II: Flex Operating System – Apple II v ITT 2020 – Reviews (Ormbeta Compact Accounting System, CGL Half-Height Drive) – Apple IIe and IIc compatibility – Handling Interrupts and large arrays in Pascal – Reporter's view of Macintosh – PLUS News, New Products, Appletips and Letters.

February 1985

Steve Wozniak talks about Apple II developments – Quicksort algorithm in Forth and Basic – Games (Deadline, Witness, Planetfall, Enchanter, Scorcerer, Expedition Amazon) – Graphics DIY part XI – Targeting with a spreadsheet – Apple to Apple file transfer – Miners' strike resolved by computer? – Chemical formulae on Lisa – two Macintosh books reviewed – World of the 6809 Part III – Software reviews (Sales Edge and Management Edge) – Application: book publishing – Split screen techniques – PLUS News, new products and letters.

March 1985

Circle drawing algorithms – Super Pilot System Log – Summarising data with VisiCalc – Competitive estimating with Multiplan – Graphics DIY part XII – Ampersand editing – Macintosh (MacTerminal, Mouse Stampede, optical mouse, plus Mac book) – Reviews (Merl modem, Intec hard drive, Vision 128/256 card, the Editor, plus three educational packages) – Fun and Games (Xyphus, Fighter Command, Picture Writer) – PLUS News, New products, letters and Appletips.

April 1985

Apples in the dental surgery – Adding graphics commands to Applesoft – Using the VBLANK signal – Getting to grips with software – Reviews (Spee-Demon card, PFS File/Report for Macintosh, W-P-LAB) – Weather forecasting with Mac – Pascal Filer's D command – Fun and Games (La Triviata, Design Your Own Home: Architecture, Interiors, Landscape) – Books (Appleworks, VisiCalc, Machine level programming) – Index to Windfall Vols. 1 and 2. PLUS News, New products, Letters and Appletips.

May 1985

Sports Day runs smoothly w Apples – Graphics DIY Part X (pie charts) – Reviews (T Workbench, Macputer I Copytext, Omnis 2 on Mac tosh, seven Logo books) – T RWTS explained and demo strated with a disc verify rout – protecting programs fr Copya – Pascal (directory acc from within programs) – B search in Forth and Basic Reaction Timer – Apples Hungary – Fun & Games (Sm Shopper, Plantin' Pal, Mi Cookbook) – PLUS News, N products, Letters and Appleti

June 1985

Apples keep track of music companies and Macintosh designs record sleeves – Fun and Games (Music Construction Set, Song Writer, Music Readiness) – Pascal Tutorial: start of a new series looks at records – Reviews (Tick-Tack translation package for Apple II+/IIe, Musicworks for Macintosh) – Graphics (three books reviewed) – Mugraph: light dependent resistors making sounds – Ampersound: routines for making music and sounds from Basic – PLUS all the latest News, New Products and Readers' Letters.

July 1985

Apples at the heart of Papworth Hospital – Fun & Games (Secret of Arendarvon Castle, Antagonists, Fahrenheit 451, Rendezvous with Rama, Amazon, Shadowkeep, Adventure Writer) – Pascal Tutorial: using files of records – Binary file load utility – Using extended 80 column card memory – Macintosh (Flowcharting, Preview of Guide) – Book reviews (Business Basic, Epson printers) – Reviews (FingerPrint and Printerrupt) – Graphics DIY Part XIV – DOS patches – PLUS News, New Products, Letters and Appletips.

August 1985

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 se – spreadsheet for home budg – Apples in a Hertfordsh college – using Page 3 routi with a language card – Graph DIY Part XVI – Reviews (Ra works extended 80-colu card, Computereyes and Ma digitisers) – add a facto function to Basic – Pas tutorial: assembly language p gramming – lower case Pasc Fun & Games (Mix and Ma Spotlight, Instant Zoo, Err Quiz) – free sectors on dis PLUS News, New Produ Letters and Appletips.

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 – &DOSFILE: 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.

January 1986

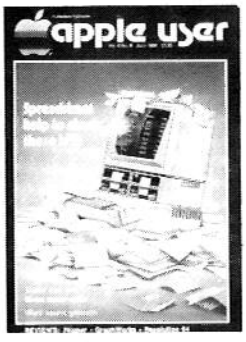
Spreadsheet model for sales forecasting – Pascal tutorial : speed-up techniques – Fun & Games (Colossus Chess 4.0, One Man Band) – Application: how a shopkeeper uses an Apple IIc – Reviews (Lawtant disk controller card, Lemi Midi interface) – Heapsort in Forth and Basic – Macintosh reviews (Crunch, Mac +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.

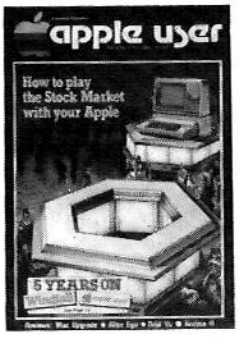
March 1986

Pascal tutorial: dynamic mer usage Part 2 – Fun & Ga (Transylvania, Ring Quest, C son Crown) – CP/M: PIP pat enable repeated comman &DOSFile: RAMdisk functi ProDOS: four books review Spreadsheet: useful miles-gallon calculator – Com budget equipment interface Apple Part 1 – Reviews (Sp Loader, P-tral) – Macin (review of Ultraplan) – Mac code step-by-step tracer uti Applesoft lower case i routine PLUS News, Products and Letters.



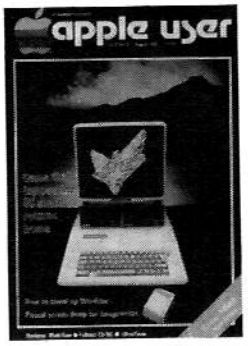
June 1986

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.



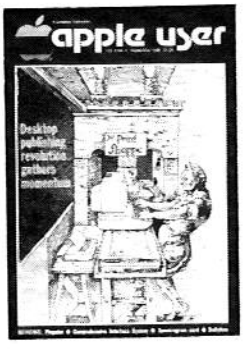
July 1986

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.



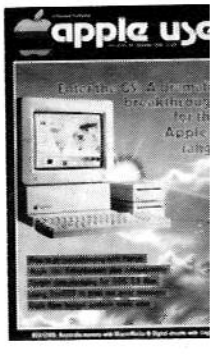
August 1986

Reviews (Expand the IIe's capacity with MultiRam, Fulltext, 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 the Macroworks utility Appleworks, circuit design Logimac, Your Best Inte (book) – Utilities: Mousekee with Pascal, ProDOS e messages, Date-stamping 3.3 files, Handling dates – Fu Games: Trinity, The Hol Stickers, MacGolf – Micro Update — Game: Space C (listing) – Business: How prepare Cash Flow Budge Hardware: Installing enha and standard roms in the PLUS all the latest Apple n new products and your lett

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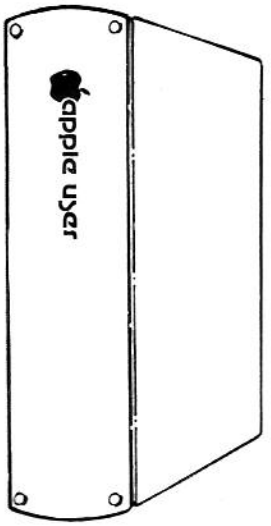

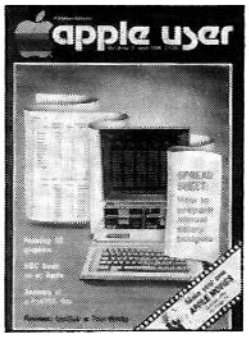

April 1986

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 Goodnight) – Scrolling hi-res pages – Making the most of Wordstar – Spreadsheet: presenting balance sheets in visual form – ProDOS Part 2 – Reviews (Supercharged Apple II with Snapshot Shuttle and Cirtech Flipper, Jeeves for desktop facilities) – DOS amendment to display free sectors – Application! Apples in use in a technical college – PLUS all the latest Apple news 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, Hi-res 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.

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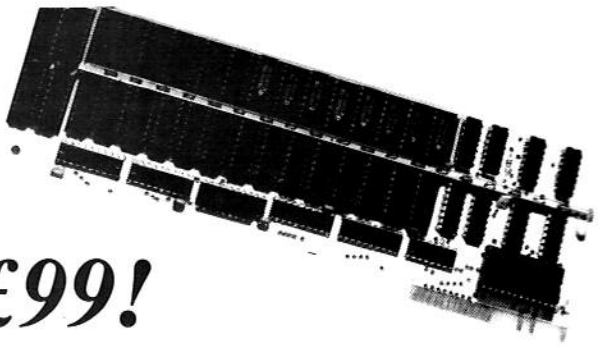

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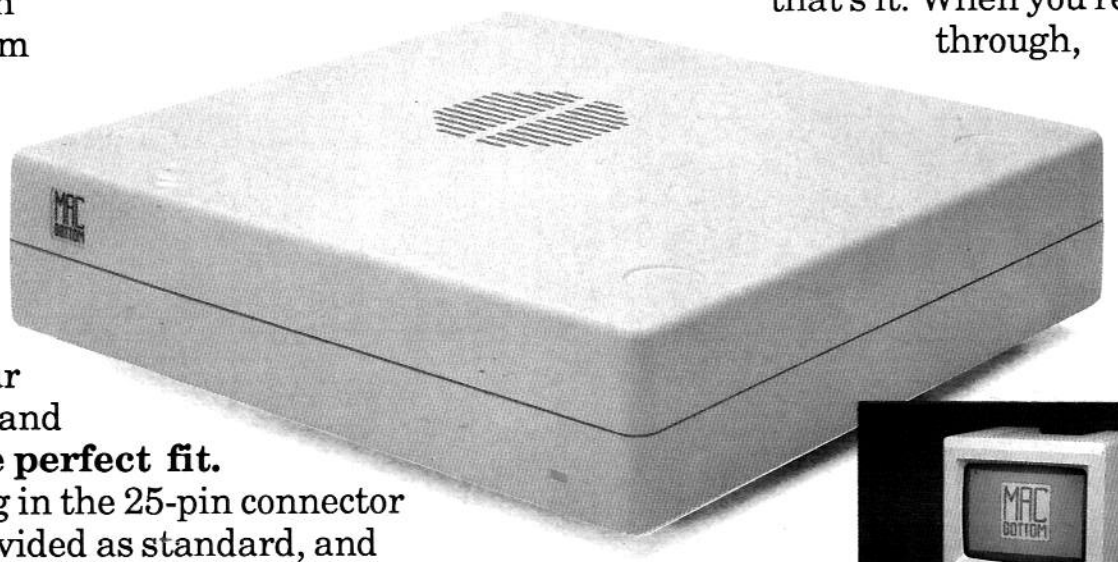

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