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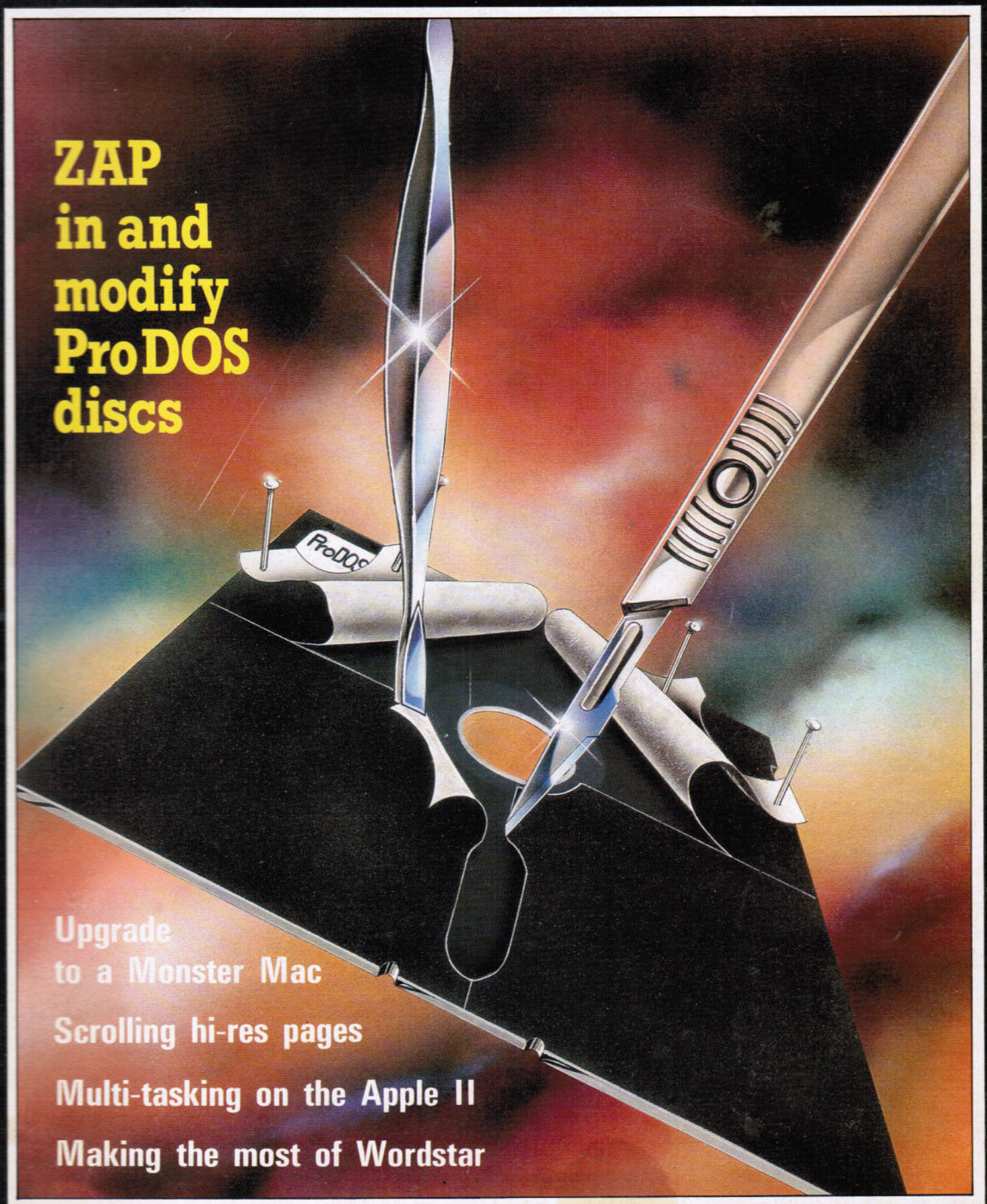

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apple user
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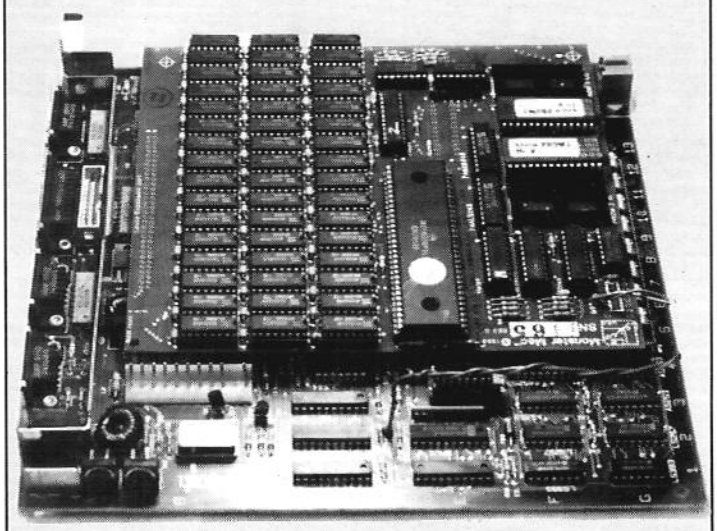

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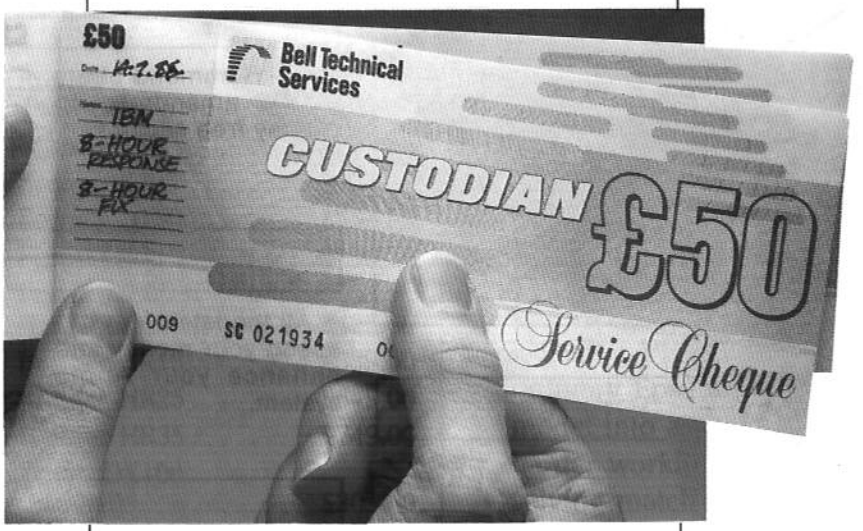

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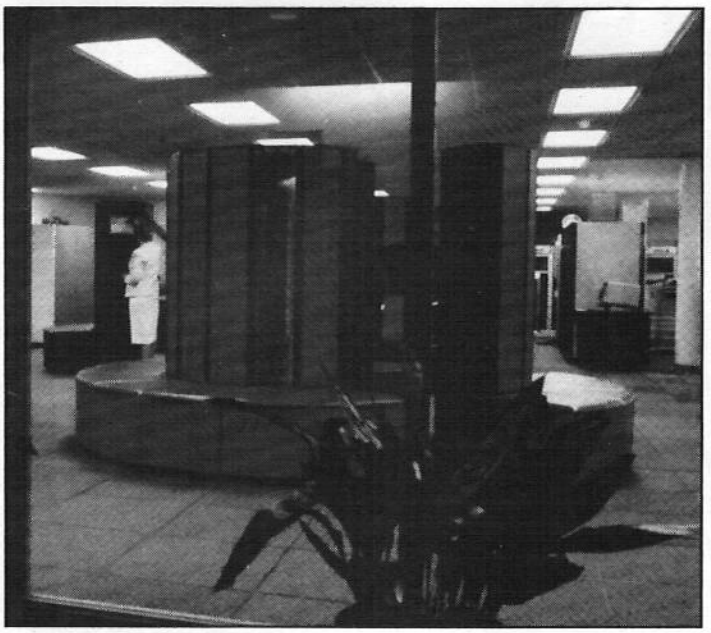


THE Cray XMP-48 is top of the line of the world's super-computers. It took nine months to build, stands 6ft 6in high and eight foot across and its four processors can handle 1,000 million calculations a second.

A Cray research team of 12 took seven years to develop the XMP-48.

APPLE has spent $15 million on a super computer to develop a range of desktop micros many times more powerful than today's largest mainframes.

Chairman John Sculley revealed details of the multi-million dollar buy at the first Apple University Consortium conference at Cambridge.

A Cray XMP-48 will help the company create the new generation of Apple machines by the 1990s.

It will achieve this by simulating the hardware needed, the designs and circuits and also the software – even before the computer is built.

Though the new machines will be infinitely more powerful it is said that they will cost no more than the most advanced personal computers currently available.

Sculley said: "There is the opportunity for a giant leap in technology in an order of magnitude comparable to the microprocessor itself over the next several years.

"We felt we had to invent many of our own technologies. One of the ways that we believe we can be successful is by beginning to simulate the computers of the future even before we have the ability to build them.

"It will be possible to do this in the 1990s and within the cost domains that we have for the high end personal desktop computers of the 1980s. This is an exciting prospect".

While he spoke at the opening of the three-day conference, attended by 400 delegates from 29 different countries, a dozen experts at his company's headquarters in Cupertino were finalising the installation of the Cray XMP-48.

Christopher Henfrey, sales manager for the North of England and Holland for Cray Research, told the *Apple User:* "The simulating planned on the XMP-48 is something similar to wind tunnel testing. Instead of the cost of the wind tunnel, the plane and experts needed, the project can be done mathematically on the computer 100 times faster and at a far lower cost".

US GAMES FOR MAC

SIX American games for the Macintosh have been released by Mirrorsoft.

Balance of Power involves enhancing the world position of America and Russia without nuclear conflict.

Deja Vu is a text and graphics mystery adventure, while GATO involves submarine combat.

Outer space rescues are featured in Orbiter and Ultima II also explores the galaxy.

The last, Championship Boxing, allows selection of a possible champion and tactics needed to win.

They cost £26.95 except Ultima II, a double disc product, which costs £29.95.

New plant goes up in Singapore

APPLE chairman John Sculley has released details of the new 12 million dollar plant being built in Singapore.

When completed in July next year and equipped with automatic test equipment and low-cost automation Apple expect to exceed the present factory's output of one Apple IIe every 10 seconds.

The new plant, which will handle all IIe production, will have a floor space of over 200,000 square feet, 55 per cent more than the existing plant.

Sculley said: "Asia offers immense potential growth in the next decade and we are establishing a strategic resource centre which can serve the specific needs of this region".

John Sanders, managing director of Apple's Singapore factory, which won the National Productivity Award in 1985, said: "Since we began operations four and a half years ago our plant has become a technological leader in its employment of advanced assembly techniques and robotics.

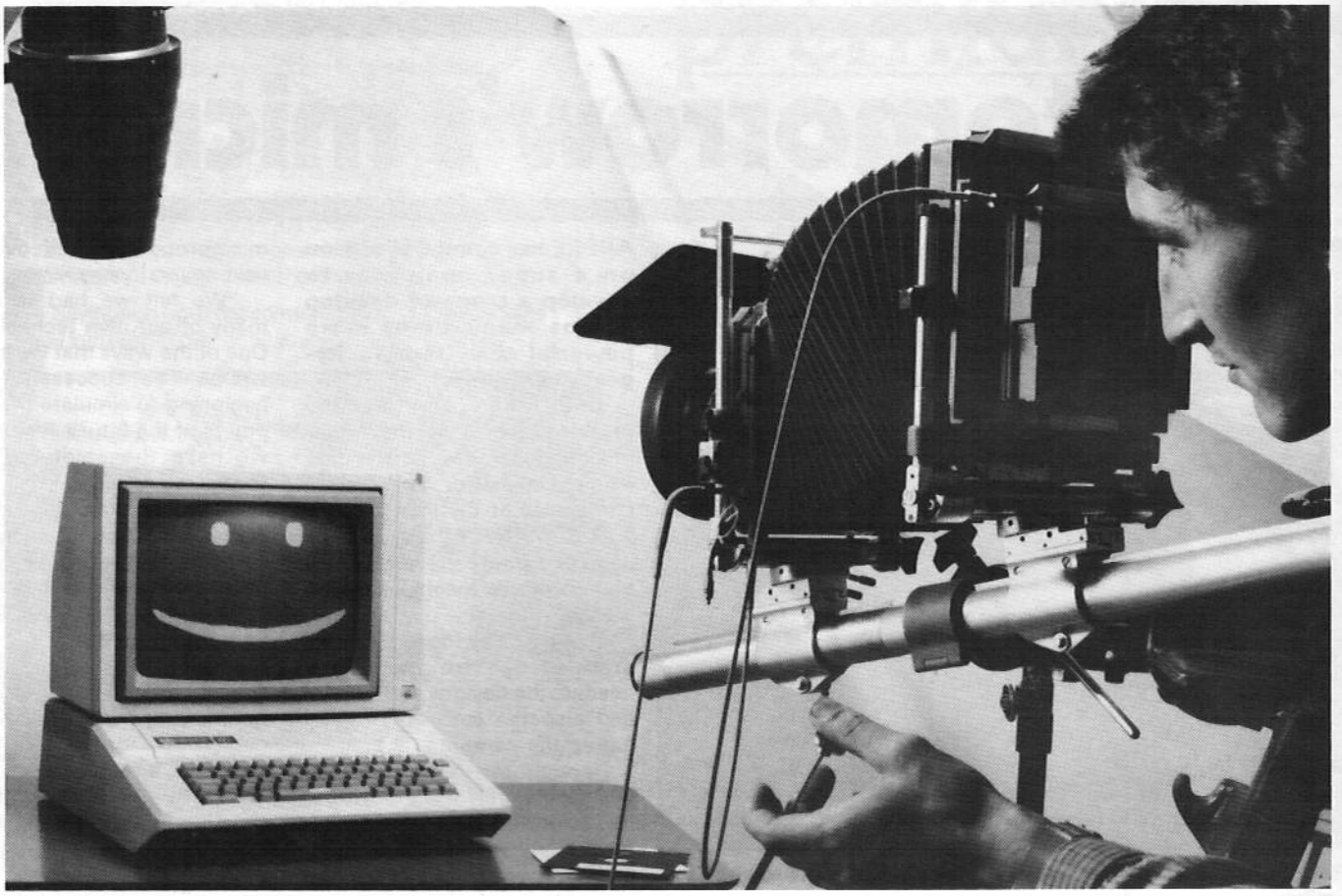
"The production insights we've gained in Singapore are being employed by Apple manufacturing sites throughout the world".

Network publishing

PRINTER manufacturer Dataproducts has launched a networked desktop publishing system for the Macintosh in conjunction with Apple distributor McQueen Systems.

The system includes a Dataproducts LZR-2665, the 26 page-a-minute laser printer supporting PostScript page description command language produced by Adobe Systems, and costs £19,000.

Some people go to extraordinary lengths to get a good picture!



Frustrating, isn't it? That dot-matrix printer and expensive interface card were supposed to let you print your Apple's display whenever the fancy took you.

But to get a print-out, you have to crash your program or make a file. Either way, it's a slow and tedious business. Then there's that long list of control commands you need to learn. And how are you supposed to capture the screen from a copy-protected program?

But hold on, don't reach for the camera yet!

The Snapshot Printerrupt gives you a better alternative; a different kind of printing utility. No matter what program your Apple II+ or //e is running, the Printerrupt can interrupt it, print its display, and resume running it as though nothing had happened. No files needed, no photography, and no frustration.

What's more, the Printerrupt's easy-to-use menu features a galaxy of *really* powerful options which put other printing utilities to shame.

And because it uses the interrupt-and-resume power of the Snapshot card, the Printerrupt gives you access to a whole new world of great, easy-to-use utilities that will enhance your Apple at home and in the office.

Ask your local Apple dealer to demonstrate the power of the Printerrupt for you, or write or call us for more information.

PRICES (ex VAT)

Printerrupt software for Snapshot //e card	£20.00
Shuttle software for Snapshot //e card	£20.00
Copykit software for Snapshot //e card	£20.00
Shell software for Shapshot //e card	£20.00
Shuttle, Printerrupt, Copykit and Shell combination pack	£55.00
Snapshot //e card for Apple II+ and //e (requires software)	£95.00

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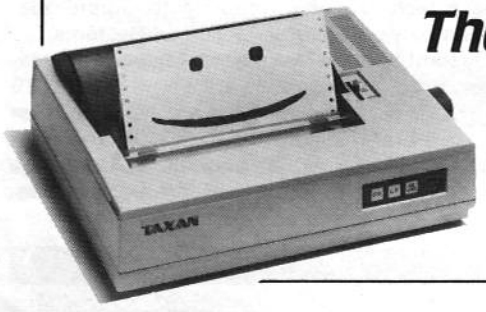

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Optical discs for IIe

PHILIPS SPG has signed a major CD ROM drive agreement with MicroTrends of Illinois making optical disc technology available for the Apple IIe for the first time.

MicroTrends intends to market the Philips SPG CM-100 drive with a controller card for the Apple IIe. The card, Jonathan, incorporates a 10mHz 68000 microprocessor and 512k of RAM.

The system will be aimed at the educational and library markets, initially in the US and Canada, and later in the UK and Europe.

"Apple's strong presence in the educational area, combined with the obvious educational applications of optical technology, makes this controller an attractive product", said Rudy Falkenburg, Philips SPG's European marketing manager.

MicroTrends will market the system with The Electronic Encyclopaedia and other databases on compact disc with a search-retrieval software program.

Speeding

A NEW accelerator for the Apple IIe comes from Bidmuthin Technologies, the Trans-Warp. It has 256k of RAM, avoiding problems associated with caching techniques.

No pre-boot is required. At full speed it accelerates the IIe 3.5 times, or 1.7 times at half-speed. Slots can be switched out and the accelerator turned off with a keypress on boot-up.

Price: £279.

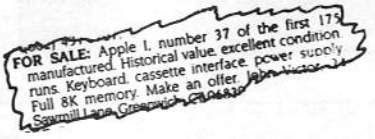
Reducing

PEANUT Computer has reduced from £119 to £105 the price of its Apple IIc external, half height, disc drive.

The Technico FD-547 is also available for the II+ and IIe at £92.

Day an Apple I went up for sale

BROWSING through back copies of Byte, the US computer magazine, UK Apple enthusiast Hugh Green came across this



advert in the unclassified section of the July 1985 issue:

Hardly able to contain his excitement over the possibility of owning an original Apple, Green put in a call to the States.

Here, in his own words, is what happened:

"I had read all about the original fabled Apple I, prototype for what the Apple II became, but had only ever seen photographs of one and that was in the hands of the man who had hand soldered it together, Steve Jobs, in the early garage days at Apple.

It now hangs in epoxy in the reception at Apple HQ with the words "Our Founder" emblazoned below it.

This batch of hand soldered units numbers only hundreds, not the millions that Apple have since shipped. They are very rare and very valuable, especially to the right people.

They came without a case, but had keyboard, power supply, 4k of RAM and no ROM, barely a cassette interface and only a monitor and assembler. That was until Woz wrote the first versions of integer Basic in pure machine code.

So it was with these thoughts in mind that I eagerly rang the number shown (deleted above to allow the poor people their privacy). The ringing began.

I had always liked the idea of owning an original Apple to go next to my IIe, but had heard tales of them being sold for in the region of $15,000. Would this be the same? The connection was made and it was answered by the owner's wife.

Hello, I'm ringing from England I am interested in the Apple I which you advertised in Byte, is it still available?, I asked eagerly.

"No . . .", my heart sank, "I'm afraid that my husband has decided to keep the computer after all".

It turns out that the owner and his wife, both educationalists, decided in 1977 that these new home computers would aid their work. So they bought the Apple I.

However this hand soldered machine was unusable due to the lack of software and the owners' little knowledge of computers. So it was retired to the attic, where it stayed until now.

Callers ranged from a 14 year old who offered him $75, to a man who offered them a complete IBM PC system with 640k, hard disc and printer. The calls ranged from the West Coast to the UK.

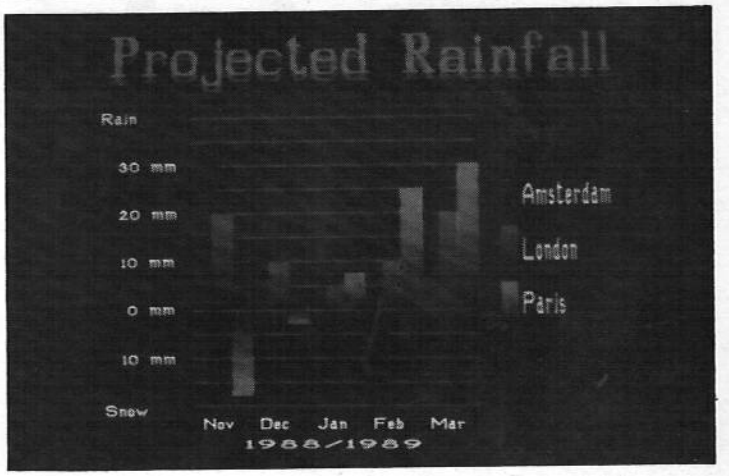
Surprised by the interest in this apparent heap of wires and electronics, they consulted a friend – who told them of the machine's true worth. He decided to keep it."

Jazzed up

AN enhanced version of Jazz designed to take advantage of the increased RAM and disc space of the Macintosh Plus, will be released by Lotus this month.

The integrated word processing, spreadsheet, database, graphics and communications package – Jazz 1A – will sell for £295, £155 less than its predecessor originally cost.

Price of the earlier version of Jazz is also reduced to £295 and there will be a free upgrade for those who bought the package between January 16 and May 19. Users who bought Jazz earlier can upgrade to Jazz 1A for £20.



SLIDES ON APPLE IIe

PISA Graphics has released a slide presentation system for the Apple IIe.

The Presenters Interactive Slide Album (PISA) is a turnkey system that allows immediate design on slide with the aid of a graphics tablet, a painting screen and a Help screen for prompts.

Features include 64 colours on screen at a time, numerous paint brushes and a variety of special effects.

Bali beckons

APPLE dealers from Australia and New Zealand flocked to the exotic South Pacific island of Bali for their conference and exhibition.

Software from all parts of Australasia was on view and many contracts were signed.

Sybiz Software's Shopkeeper program for the small retailer, which enables on-the-spot invoicing, proved a big seller. Sybiz boss, John Hardy from Adelaide, signed an agreement with a representative over from the new Zealand Computer World, who will market the Shopkeeper package worldwide.

More games

ACTIVISION, aiming for worldwide market increases with its software products, is producing versions of two of its most popular titles, Hacker and Mindshadow for the Apple.

Hugh Rees-Parnall, Activision's managing director, says: "The new versions have been tailored to take advantage of the sophisticated technology available in the latest computer systems.

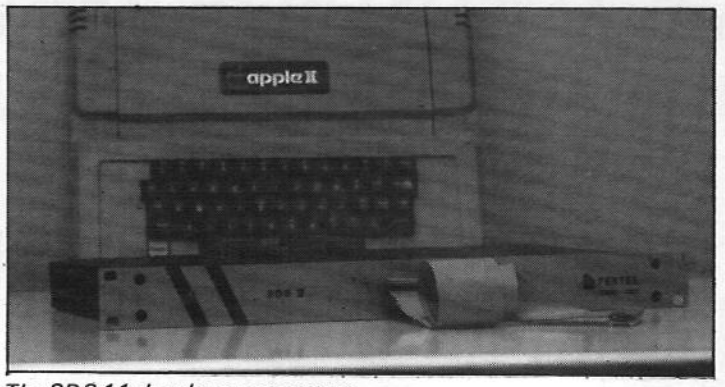
"We are very excited about our entry into the Apple market because the expanding capabilities of the system broaden the potential for creative development even further".

★ ★ ★

AN adventure for Apple II and Macintosh users has a small-time private detective as the hunter – and the hunted.

Activision's Borrowed Time, set in the 1930s, entails tracing 20 suspects who want the hero dead. Avoiding being shot, beaten-up or imprisoned demands fast reflexes.

Hugh Rees-Parnall, Activision managing director said: "Only the movements of the private eye are controlled, the bad guys' actions are sudden and unexpected, making the pace frantic". Price £14.99.



The SDS 11 development system

Development system

SDS II, from Pertel, is a development system for writing and checking software in assembler as well as circuit testing devices.

It uses the Apple II or IIe and a common assembler of the Big Mac or toolkit type, with subsequent transfer to equipment under test.

Apple out £500,000 in US schools deal

REPORTS from the United States suggest that Apple may have been ripped off to the tune of £500,000.

The San Francisco district attorney is investigating a case which involves both the Roman Catholic Church and a leading West Coast Apple dealer.

It seems that the Catholic Archdiocese of San Francisco ordered 1,500 Apple IIs from the Californian dealer under a special deal for schools.

However only 400 of the machines found their way into classrooms, the remainder being sold at a considerable profit on the East Coast.

"Nobody did anything improper", insists the lawyer for the firm which allegedly found other markets for the discounted computers.

Meanwhile there are some red faces among Church officials in San Francisco. "We are painfully aware of the situation", a spokesman told *Apple User.*

"Our intention now is to resolve the situation the best way we can and make amends".

According to informed sources in the States no one is in fact blaming the Church in this case. But Apple has already suspended the dealership pending the outcome of the DA's enquiries.

Integrated comms for AppleWorks

AN answer to criticism that AppleWorks isn't up to IBM integrated software because it lacks comms has come from Bidmuthin Technologies.

Pinpoint is a new software package which provides terminal type telecommunications integrated with AppleWorks.

The program supplies 300/300 or 1200/1200 Baud comms directly from AppleWorks and supports the super serial card IIe and IIc ports.

It enables Apple II owners to use electronic mail/telex services such as MicroLink, Telecom Gold, One-to-One and Easylink and to access most bulletin boards, but will not handle Prestel or viewdata.

Pinpoint is co-resident with AppleWorks, allowing messages to be transmitted and received without quitting AppleWorks, and it is compatible with the Ramworks extended memory card, allowing it to fully reside in RAM.

Messages can be created and edited using AppleWorks and the word processor file transmitted with a single key press or downloaded directly into an AppleWorks word processor file for editing.

As well as providing comms, Pinpoint functions as a desktop accessory for AppleWorks, providing calculator, appointment diary/calendar and notepad functions.

The program will merge graphics from Mousepaint or Dazzledraw with text from the AppleWorks word processor.

It requires a IIc or 128k enhanced IIe and AppleWorks, and costs £69.

Disc card software bundle

FOUR free pieces of software – for the DOS 3.3, Pascal I.I, ProDOS and CPM 2.20b and 2.26 operating systems – are now being bundled with Lawtant's Floppy Disc Controller card for the Apple II, II+ and IIe.

Lawtant's controller is a single printed circuit card which plugs into slot 7. It may be connected to one or two 8 in, 5.25in, 3.5in or 3in drives.

It provides over one megabyte of storage on 8in and 5.25in hard disc drives and 640k on other types. Programs will be available shortly to support even higher capacities.

The controller card and software costs £150, with one high density 77 track drive £390 and one double density 80 track drive £310.

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It may have been due to David Palmer's feature in last month's *Apple User,* but we have experienced an unprecedented demand for the new Unidisk 3.5. Obviously a new product from Apple always causes much interest and excitement, but this relatively inexpensive mass storage device has been greeted with great acclaim by Apple II+, IIe and IIc users. Quick and quiet in operation, a capacity of 800K, neat in appearance, great for AppleWorks, it is the ideal product to up-grade your existing system.

Now that AppleWorks has firmly established itself as the easiest to use integrated software package for the Apple II series, it has opened the door wide open for add-ons that make it even more powerful. **Pinpoint** is a desk-top accessories program instantly giving AppleWorks the added power of communications, desk-top calculator, appointments calendar, notepad, graphics merging function and much more!

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In search of the perfect persona..

ULTIMA IV, as the name suggests, is the fourth and largest of the Ultima series written by Lord British. It occupies both sides of two discs.

After the wizard Mondain, his apprentice Minax and the evil Exodus did their worst, Lord British founded a new land, Brittania, seeking to improve the quality of life of his subjects.

Subtitled Quest of the Avatar, the aim is not to seek out and destroy some evil being but to conquer evil within oneself. You must become an Avatar – a perfect person.

You choose your initial attributes during a conversation with an old gypsy woman. The questions she poses are somewhat devious and the result, not surprisingly, is an imperfect character. You are given some gold, food and a trade, but little else.

You start out on your quest alone. In the towns, villages and castles you meet up with hundreds of others, some of whom will perhaps be willing to join up with you if they agree with your principles.

Virtually everyone you meet has knowledge of things which can help you, but they will not volunteer this information unless asked.

In other adventures of this type people tell you things but you cannot talk with them properly. Ultima IV carries the conversations a step further because you can ask characters about their health, job, and so on.

Most of the minor quests depend upon you doing just this. Although a great idea, it is rather limited as you can only say one word at a time and the vocabulary is rather small.

The cloth map supplied is somewhat vague, and is also incomplete. The towns and castles are marked but not named. No indication is given as to the whereabouts of the villages, shrines and dungeons.

About a quarter of the map is uncharted and this part contains important islands so additional mapping is necessary.

Travelling is mostly on foot but there are horses to be bought and ships to be commandeered. There is also a balloon if you can find it.

Several moongates dot the land – these are marked on the map – and appear at certain phases of the two moons, Trammel and Felucca.

Walking is a somewhat hazardous occupation because of the various prowling creatures with an insatiable appetite for travellers' flesh. Although these encounters are sometimes a nuisance they are necessary in order to gain experience and gold, both of which are essential to further your cause.

You can retreat from these battles if you wish – oddly, this results in the complete disappearance of your foe.

There are spells and enchantments to be used but these cannot be cast automatically. The necessary ingredients have to be procured and mixed. There are herb shops in some of the towns but some important herbs are rare and cannot be purchased.

The screen display is split into two major sections, the left hand side being used for a colourful image of the lands, showing various terrain features ranging from grass and marshes, to hills and rocky mountains.

The party of characters is displayed at the centre of the window as one anonymous, unanimated warrior while the surrounding countryside scrolls quickly and effectively around as you travel.

Anything above head height, such as a mountain is not visible – it is blacked out on the screen – giving a genuine impression of being there, not just a bird's eye view of the area.

This principle also applies in the towns and cities. On the main map these are shown almost as icons, being drastically out of scale. But upon entering them they enlarge, so you have a few more scrolling screenfuls of buildings and shops to explore and people to talk to.

Although you are portrayed on the screen without moving your legs, all other characters are excitedly animated. Warriors wave their swords around, bards strum their lutes, and orcs seem to have a mild dose of St. Vitus' dance.

If you are set upon, or happen to attack someone who doesn't give you the right information, the display switches to a blow-up of the area you are fighting on.

This tiny battlefield can be clear if you are fighting on grass, strewn with stone if you are in a hilly area, or depict a ship surrounded by water if you are picking on a supposedly harmless sea horse. In fact, there are over a dozen different backdrops.

In battle, your zombie-like pseudo character is discarded and you are shown as the race you are, together with the rest of your colleagues and followers – if you have any.

You can control each of these in turn, so it is possible to surround a poor lava lizard and beat it from all directions.

Upon venturing down a dungeon you are shown – assuming you have light – a 3D view along the corridors.

This is similar to Wizardry, but is faster and filled in with

colour, again contributing to the overall sense of realism. Combat is displayed in the usual manner though.

There are also rooms in dungeons, rather like battle screens, but with various exits. They are usually filled with hordes of ravaging beasts, and, of course, have to be explored and got through to discover more mappable dungeons.

The packaging boasts hundreds of these, and most that I have seen are fiendishly designed.

The right hand side of the screen is divided into upper and lower windows. The top box shows the character status, including each person's condition – good, asleep and so on – their health – in the form of hit points – and the amount of food and gold the party is carrying.

Below this is the text section, with 12 lines of scrolling entry – all spoken words and messages are shown here. The character set is upper and lower case and is double thickness, so that you don't get those vile purple and green characters on a colour television.

The Apple speaker emits a variety of explosions, pings and crashes that are equal to many arcade games.

There is also a Mockingboard facility for up to two boards. Apparently, there is a constant musical score and speech for those with this card – I think my next investment will be a Mockingboard, if I can find someone who sells them over here.

Included in the package, along with the cloth map and two discs, are two books – The History Of Brittania and The Mystic Book Of Wisdom, two reference cards and an OSI product registration card.

Ultima IV is innovative and interesting to play, with some minor limitations. My copy remains unfinished after two months, which is a tribute to the game's depth and complexity. It's just what Ultima fans have been waiting for.

Julian Scott

Title: Ultima IV
Author: Lord British
Publisher: Origin Systems
Requirements: 64k

Spellbreaker's a spellbinder

ONCE upon a time when I was but a mere apprentice necromancer to whom the word grue meant nothing, I had the good fortune to thrash the evil warlock Krill.

He was an ambitious wizard, aspiring somewhat immodestly to rule the world. I managed to frustrate his little game, my inexperience succeeding where others more learned had failed.

For my efforts I was admitted to the famed Circle of Enchanters and regarded as second only to the great Belboz.

Then Belboz himself landed in the newt soup and I had my work cut out trying to rescue him from the clutches of the odious Jeearr. That's how I came to be where I am today, top dog of the Circle of Enchanters.

Having thus completed those two superb Infocom adventures **Enchanter** and **Sorcerer.** (Rated as standard and advanced level), it was with anticipated pleasure and a touch of smugness that I took delivery of the third in the Enchanter trilogy, **Spellbreaker.**

Removing the usual glossy and handsome box from the sturdy packaging my eyes fell on two words which gave the old ego pause for thought – Expert level.

Spellbreaker begins in the council chamber of Borphee where the Guildmasters are up in arms. You stand at the edge of the gathering, listening to the complaints.

Sneffle the baker moans that he now has to make his butter pasties by hand. His usual method of casting a Gloth spell to fold the pastry 83 times is no longer reliable.

Hoobly the brewer grumbles that his spells are not working either and as a result he's getting cherry flavoured liquid from his vats and the beer tastes like grues have been bathing in it.

The Guild think the Circle of Enchanters have a lot to answer for and many eyes turn contemptuously on you.

Ardis the poet starts to speak about magic rhyming and spelling aids when, in the midst of his splendid peroration, just as he's sketching out a mythological skit in iambic hexameter, he turns green – well, greener than usual. His chin elongates, his skin slimes up and he promptly turns into a newt.

He's not alone – all the Guild have turned into frogs, salamanders or other amphibians. All except you – and one other, a shadowy figure in a dark cloak who slips out of the door.

You pursue him to the town square where he disappears engulfed in a cloud of orange smoke, leaving behind – once the amber fog has dispersed – nothing but a featureless white cube.

And so the battle of good against evil begins. Magic is going awry. It is your task to get to the root of this paralysing blight that threatens to destroy the kingdom.

Your journey will take you to strange places where you'll meet even stranger beings.

Among the earlier curiosities you'll encounter is a tail-swallowing serpent whose mammoth body forms a huge loop through three tunnels of a cave.

Another is a beautifully described mountain ogre. He has brilliant purple carbuncles and hair matted down with something slick and pungent.

Watch out for a croc the size of an elephant whose hatching egg is itself as big as a small wagon.

As well as a knife and magic burin (engraving tool), you also start out with your indispensable book of reusable spells.

Other spells can be added to the book by finding spell scrolls, of which there are many scattered around the kingdom, and then writing them into the book by using the special Gnusto spell.

Some spell scrolls are too powerful to be written in the book. These spells can be used directly from he scroll but will only work once.

This is Infocom's 18th adventure and the standard remains as high as ever – just how many companies can you recall that have produced almost a score of first-rate pieces of software in a row?

They've even added a new command to their already sophisticated parser.

If you type in a sentence with one word wrong, for example: "Put the silver cubw in the green box" you can correct yourself simply by making your next command OOPS word (Oops cube). This saves you typing in a long sentence all over again.

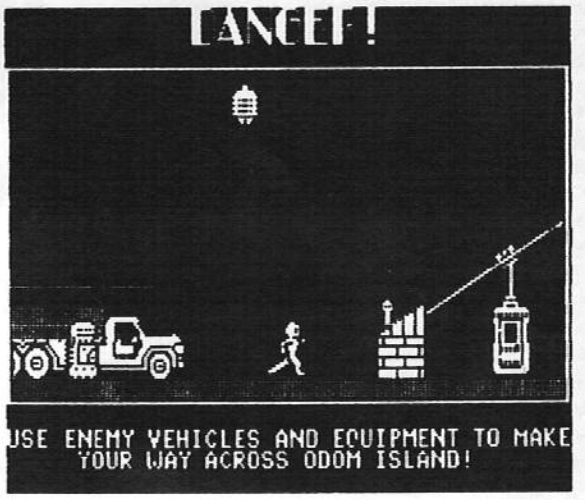
A gripping story, huge vocabulary – over 900 words – vivid descriptive prose, tantalising puzzles and delightful humour. In a word, Spellbreaker.

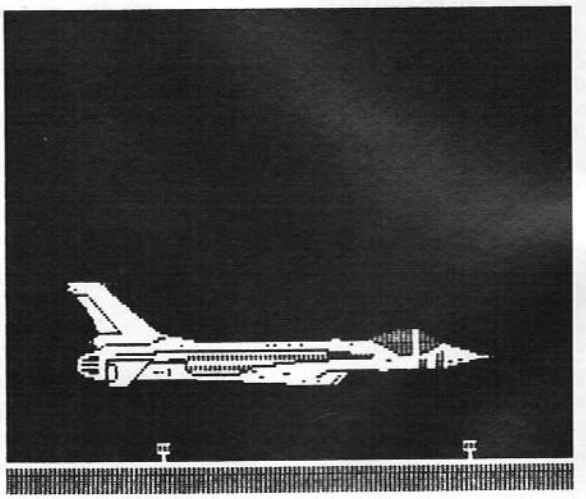
Don't hang about – Rezrov your cashbox, Malyon those legs down to the nearest phone and order Spellbreaker from your local dealer now.

Bob Chappell

Title: Spellbinder
Publisher: Infocom
Requirements: Apple II or Macintosh

Captain Goodnight raises the standard





BEFORE going into the details let me fill you in on a bit of background. In this scenario a mad scientist by the name of Dr Maybe, armed with his Acme Doomsday Machine MKII is threatening mankind with total destruction.

You play the part of the hero, Captain Rosco "Buzz" Goodnight, and it's up to you to stop this maniac before it's too late. A typical scenario perhaps, but when you look further, you find an exciting new game.

The programmer has incorporated some of the latest techniques in large scale animation, and as a result large objects move very smoothly indeed.

This is seen as soon as you get into the game when a large and detailed helicopter gracefully hovers in, lands, drops off our hero who waves to the pilot, and then takes off again. The first time you see it you just can't help being impressed.

After a quick briefing you run on to the runway, where your huge graphics jet fighter is waiting for you, all fuelled and ready. The animation of our hero is particularly impressive – ultra smooth and very realistic.

The background scrolls as you run, but there's not usually a lot there. It's really the objects on the ground which move past you as you run.

Once you get in to the jet you taxi on to the runway and the plane swiftly lifts off the tarmac, the undercarriage folds up easily and you're away.

The view then changes to a scrolling landscape – similar to Star Blazer but better – and you are now flying a much smaller plane.

As you fly over various terrains you are constantly being bombarded by low flying aircraft, cruise missiles, ground missiles and anti-aircraft cannons.

It certainly keeps you busy and alert and it can take a little while before even the best player can reach the end of that sequence, which is a shame because if you crash you have to go back to near the start.

This seems a little unfair and it may put a few people off, since it can get a bit long and tedious at times.

After a while you reach the desert and before too long a signal flare shoots into the night air which triggers off the auto-eject mechanism in your jet.

Our hero then elegantly descends on to the desert sands with the help of his helicopter-like backpack.

Then, left on your own you set off on foot in search of Dr Maybe.

The villain's underground complex is situated on Doom Island. To get there you go from island to island until you reach it and disarm the Doomsday Machine.

To travel the islands you can use anything you can get your hands on including jeeps, trucks, boats, submarines and many more graphic masterpieces which lay waiting to be discovered by the player.

Each island has its own special blend of sinister air and ground-based cybernetic defence units, so there is plenty of variety in the game.

This makes it very challenging because when you encounter a new sort of automatic defence unit you have a struggle dealing with it, since you have no idea of how it works or what it does.

Thus multiple strategies have to be developed in order to complete all the various stages in the game.

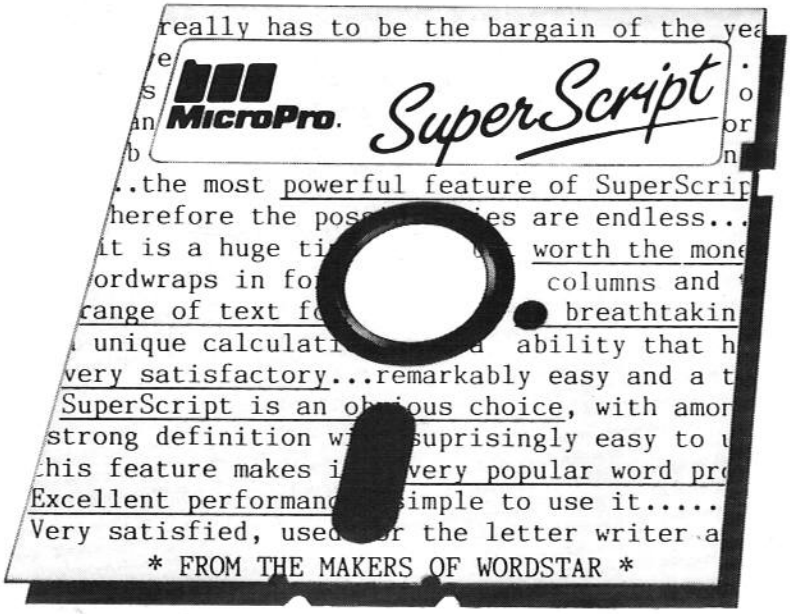
The game makes compulsive playing – there is always the urge to get just that bit further and see what lies ahead. It is also a new kind of challenge for Apple game players and good value for money.

It took me many hours to complete the game and I'm sure it will give any player many thrilling, action-packed hours of fun. Captain Goodnight is one of those landmarks of gaming excellence that raises the standard of Apple games a few notches. If this is the shape of things to come we are in for a memorable year indeed.

Leon Seltsikas

Title: Captain Goodnight and the Islands of Fear
Author: Mike Wise
Publisher: Broderbund Software
Requirements: Any Apple II with a joystick

WORDAHOLIC



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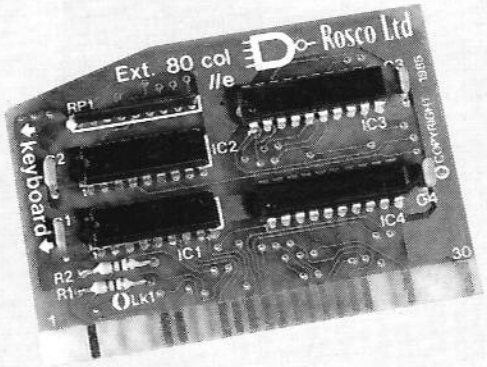

RESOLUTION 64

The RESOLUTION 64 is the latest release from ROSCO, giving an 80 column screen and full 64K memory expansion. It doubles the resolution of the hi-res page and is compatible with DOS, ProDOS, CP/M and PASCAL. The RESOLUTION 64 is a direct replacement for the Apple Extended 80 Column Card at a quarter of the price. A standard RESOLUTION card is also available with 1K of static RAM. For use on the Apple IIe only.

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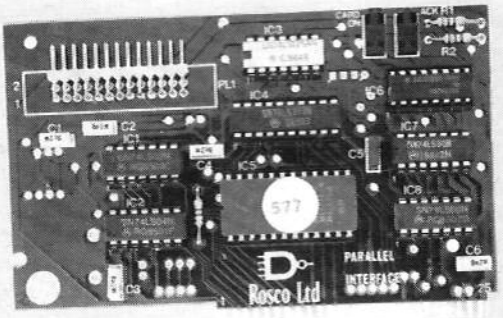

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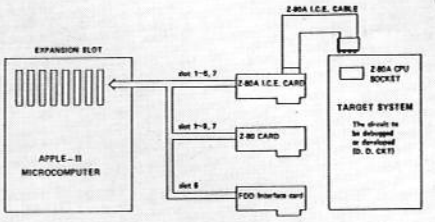

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MacUpgrade

The upgrade path to Monster Mac

BILL ALLEN looks back on a big building job

LIKE many other pioneers who spent their hard-earned cash on an overpriced 128k Macintosh seeking the excitement of a new icon-based experience, I soon came up against the problems associated with limited memory and rather pedestrian disc drives.

At least I didn't join the ranks of those thinking, or hoping, that a single drive would be enough. The 512k Fat Mac soon appeared, followed by the official upgrade at the unbelievable cost of £850.

Of course one large organisation in the UK came up with an upgrade of their own at a better price but, since it was based on using 64k dynamic RAMs this wasn't an attractive proposition – the notion of crowding out the insides of the Mac with so many chips just to get to 512k seemed rather clumsy.

So I did what all wise adventurers do – waited. Fairly soon several publications from the USA appeared with details of how to do the upgrade to 512k using the newer 256k chips, and inevitably, an article appeared in an UK periodical, with a detailed description of the upgrade.

At the time, July 1985, that author reckoned that these chips were about £15 each, so that the cost of replacing the 16 existing RAM chips and buying the 74F253 multiplexer and some decent IC sockets should come to about £250.

A few phone calls later I'd managed to locate a supplier who was willing to let me have all 16 RAMs and sockets for a straight £50 – it certainly pays to look around.

At this stage I was prepared to do a simple printed circuit board layout, loosely based on the published circuit. But then I read of a USA company Levco Enterprises, from San Diego, which offered a whole range of upgrades from a full installation service at $264.95 down to the most basic 512 kit at $49.95.

This consisted of only a miniature PCB adapter board and the remaining components for the upgrade, and didn't include the RAM chips. Although they could supply these pre-tested, they seemed to cost about twice as much as I could get them for over here.

Now came the stage of much soul-searching. I would obviously buy the RAM chips over here, but what was the advantage of buying a simple adapter board kit from the USA when I could make up my own version for a tenth of the cost?

The answer was that I had set my sights on the even bigger upgrades that Levco had available – I felt that it was worth spending the $50 on the 512 kit just to be able to judge the quality of the documentation and the support that I would get from Levco, in the event that I would eventually upgrade even higher.

So the decision was made – £50 in used notes for my RAM chips and a quick flash of my plastic card to Levco, and the deal was done.

I figured that it wasn't worth paying the extra cash for having the kit delivered express, so I opted for delivery by US Mail. This brought the cost of the 512 kit up to £37, which meant that the total upgrade was only going to cost me a total of £87 – now that's more like it.

Then I hit the first problem – I had to wait six nail biting weeks for the delivery, even though the goods had been despatched the same day as I phoned the order.

Eventually a large envelope appeared, and in it was a comprehensive 31 page manual with a tiny plastic bag containing the multiplexer, a few other components, and the tiniest PCB I've ever seen – 1.0 by 0.4in. A quick read through the comprehensive manual confirmed that I'd done the right thing.

The big day had finally come. I got a friend who is competent with a soldering iron to help me. We started off by opening up the Mac and removing the motherboard, which took 10 minutes, and then we cut out all the old RAM chips. This may seem to be a bit destructive, but it's the safest way of doing it.

I know of one upgrade cowboy who desolders the old chips – it can be done if you've got the right kit – and then sells them to make a few extra pounds profit. But I also happen to know that he has several customers whose Macs have never been quite right since.

Cutting the chips out took only 10 minutes, but it took us a further three hours to remove the old pins and desolder the holes ready for fitting the sockets. The problem is that the Mac motherboard has two internal layers, one for each power rail and because of the huge thermal mass of these it's really quite difficult to desolder the old power pins.

The best approach is to attack the tricky holes from both sides simultaneously with two soldering irons. It seemed a bit drastic at the time, but it got the job done with a minimum of risk to the motherboard. It only took 25 minuts to solder in the sockets and fit the new 256k dynamic RAMs. The last stage was to assemble and fit the tiny adapter PCB, after cutting a single track on the motherboard – this took another 10 minutes.

Now the moment of truth had arrived. Everything was carefully checked, and the Mac was reassembled. On powering up, everything appeared to be as before – I had rather hoped for a congratulatory message to appear on the screen, confirming that I indeed did have a Fat Mac.

But it was left to me to check the system out. The way that Levco recommends is to try the disc copy program – if it comes back and tells you that it will only work on a 128k Mac, then you've won. If it doesn't, very detailed procedures are given to help locate the fault.

Another way is to select About the Finder from the Apple menu on the desktop – this only applies to version 4.1, and later.

Yet another way is to load Microsoft Basic, and run a simple program that prints out the values of the functions FRE(–1), FRE(–2), FRE(0), which show the number of bytes of unused memory in the heap and stack, and in Basic's memory space, respectively. These should total about 392k.

Finally, I ran the early MacWrite program – remember the RAM-based one that would only allow you about 10 pages of text? Well, I now managed to squeeze 85 pages.

At the end of the day we'd done a neat, unobtrusive, upgrade and fully tested the system for an investment of £87 and a little over four hours' labour. Surely I would now sit back and enjoy my newly-fattened Mac for the next year or two?

But no – I had developed a terrible disease called memory mania. I was now greedy for Levco's biggest upgrade – their famous 2mbyte Monster Mac.

In theory, due to the way in which the address decoding has been done on the Mac, it is possible to go up to 4mbytes, and some companies actually do offer this option. But I decided to stick with Levco's 2mbyte for three reasons – I didn't want to crowd out the motherboard with anything bigger in case some other goodies came along that I wanted to fit inside the Mac, it

MacUpgrade

would have cost me a lot more cash which I'd sooner spend on new software and I was by now fully convinced that Levco had thought out the whole question of Mac upgrades in general – not just memory.

The Monster Mac upgrade comprises a 6.4 by 7in daughter board that holds a few ROMs, Eproms, TTL chips, and a further 1.5mbytes of 256k dynamic RAMs, to take the total up to 2mbytes. It also holds a 68000 microprocessor to replace the one that has to be removed from the Mac.

Something that should be pointed out is that you can only upgrade a 512k mac to 2mbyte. So, if you have a 128k, it must be first upgraded to 512k – preferably this should be done using the 512k kit described above, since this is so compact as to leave sufficient room for the daughter board.

Again, Levco offer a whole range of kits, starting at $499.95 for a fully socketted and tested board without RAMs. For each 0.5mbyte of RAM added to the board they charge $100, so the full upgrade 1.5mbyte taking the Mac up to a total of 2mbyte costs £799.95.

The thought crossed my mind that I could again save quite a lot by buying my own RAM chips. This time, however, it isn't as straightforward.

Whereas most 256k dynamic RAMs can be used with the 128k to 512k upgrade, the additional complexity of the Monster Mac circuitry requires that only HM50256P-15 chips will do the job – or an exact equivalent, of which there are very few.

Also, the Monster Mac is a far more complex beast than the 512 kit, so I decided to opt for the fully assembled and tested board, complete with RAMs, at $799.95. Having somewhat lost faith in the US Mail I had it sent to me Federal Priority 1 and it arrived only two days later.

Armed with my trusty friend Steve and two soldering irons, we once again dived into the Mac's insides (getting to be regular taxidermists!) This time, instead of having to cut out 16 dynamic RAM chips each with 16 pins we just had to cut out the 64 pin 68000 microprocessor.

This is because the Monster Mac daughterboard derives all the address, data and control bus signals from the 68000. So by replacing the mac's soldered-in 68000 by a socket, the daughterboard with its own 68000 is mounted piggy-back fashion onto the motherboard.

This removal and the subsequent removal of the old IC pins took only 30 minutes, and a further 25 minutes saw the installation of the socket where the 68000 had been, a couple of other single pin connectors, and the daughterboard fitted on the motherboard.

Figure I shows a photograph of the completed assembly. Note the extremely compact 512 kit upgrade on the Mac motherboard just in front and slightly to the right of the large chip – the 68000. Finally, a single jumper wire linked the two boards, and they were refitted into the Mac's chassis.

It's worth pointing out at this stage that, as with the 512 kit, the exact details of the Monster Mac upgrade are dependent on what revision version the motherboard is, and that Levco's instructions are once again very explicit.

The last part of the upgrade consists of fitting the MacBreeze fan that is supplied with the kit, shown to the left in Figure I.

This is a remarkable device, as it basically uses a piezoelectric crystal to cause a couple of plastic blades to vibrate backwards and forwards rapidly, thereby stirring the air around inside the Mac's case.

Levco claims that the Monster Mac, with its Macbreeze fan, actually runs cooler than a normal 512k Mac without one.

The fan mounts on a loop of Velcro to the side of the internal disc drive, and another piece holds it securely in place. This at first seemed to be a little crude, but in practice it is a very reliable way of mounting it and virtually no vibration is transmitted to the disc drive. The fan is very quiet, and only a faint hum can be heard in an otherwise silent room. In a typical office or study it just can't be heard.

Now came the first problem. The fan is provided with two spring clips, and a diagram shows precisely where to attach these on the Mac's analog board to derive its power. The clips were intended to be attached to the cathode end of the diodes CR25 and CR26 on the analog board. But, when I inspected mine it looked completely different to the diagram supplied.

A little bit of debate, and we decided to attach the fan to the cathodes of diodes CR24 and CR25 of the UK board.

Sweating buckets, and with fingers in ears, we switched on the mains, and watched the fan try to beat itself to death on a cable dangling nearby. This was no real problem – we simply used a nylon tie-wrap to hold the cable out of harm's way, and we were back in business.

Then we did something really silly. We decided that we didn't like the spring clips on the fan, and that we'd prefer to solder the wires to the diodes instead. This shouldn't have been a problem, but we didn't allow long enough for the capacitors on the power supply to discharge, and so we got a hefty spark when we touched the first diode with the soldering iron.

Luckily for us we only blew a fuse, and we soon had the Mac up and running, safe and sound inside its case again, after carrying out a few well-documented adjustments to the power supply to cope with the additional 2.6 watts load of the extra circuitry – you need to use a digital voltmeter for this.

With the job finished the Mac had to be checked to see whether or not it recognised the extra 1.5mbytes of RAM that it now had. Levco has thoughtfully provided a simple verification of

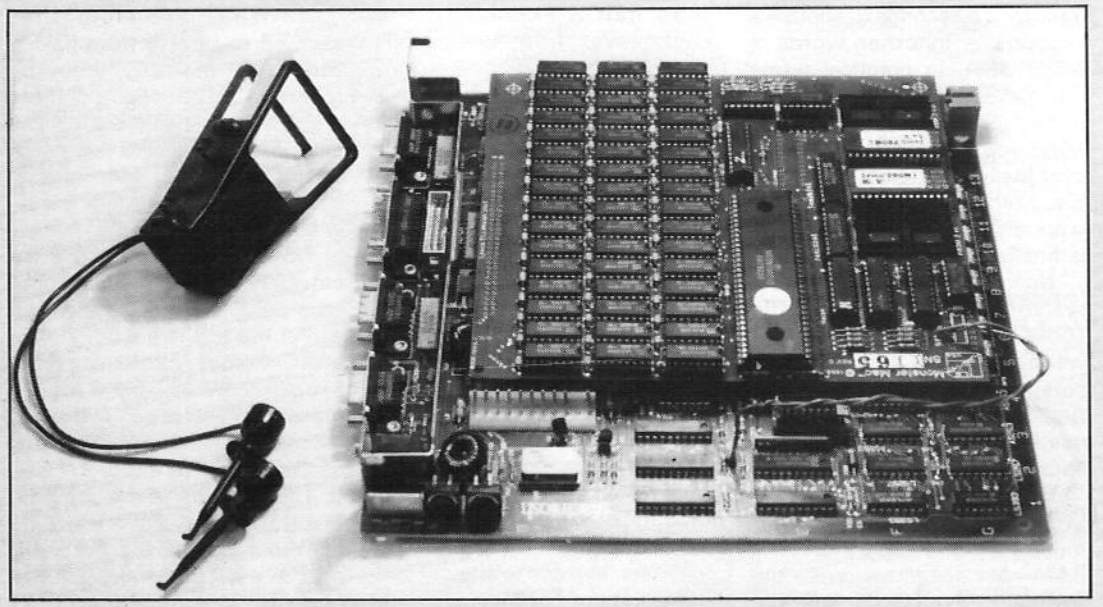

Figure I: The Monster Mac upgrade and MacBreeze fan

MacUpgrade

this – underneath the usual blinking disc icon, they have added three small open boxes.

Each one represents an additional 0.5mbyte of memory, and if this is present the box is filled in. Since we had all three boxes filled in, it meant we had finally met the Monster Mac.

Of course being sceptical we used the Finder as described earlier to verify that we had full 2mbyte of memory, and got further confirmation by again using the FRE(–1), FRE(–2), FRE(0) instructions in Microsoft Basic.

Figure II shows a summary of the differences observed between a Fat Mac and a Monster Mac. Note that Levco even made a subtle change to the mac icon to confirm that it's a Monster that we're now dealing with.

Since MacWrite is probably one of the most popular programs on the Mac, I thought I'd have a look at how much faster it would be if a RAM disc was used instead of a pair of floppies. So I created a 20 page single spaced MacWrite document, and tried five typical operations.

The whole document was changed from left to fully-justified, and then changed from single to one-and-a-half spacing.

A further page was then cut from the end of the document and pasted into the centre, all 140 occurrences of the word Macintosh were changed to Mac, using Change All, and finally, the whole document was saved.

The whole exercise was repeated again, but this time all the files were first transferred from the MacWrite disc to a RAM disc, created using the excellent Mac.Memory,Disc from Assimilation, Inc.

The result was that the processing times for the first four operations were 1.5 to 1.9 times faster when using the RAM disc. For the final one which, of course, is almost solely determined by disc access, the RAM disc was about five times faster. As a general rule I found that disc accesses using the RAM disc were always between five and 10 times faster than when using floppies.

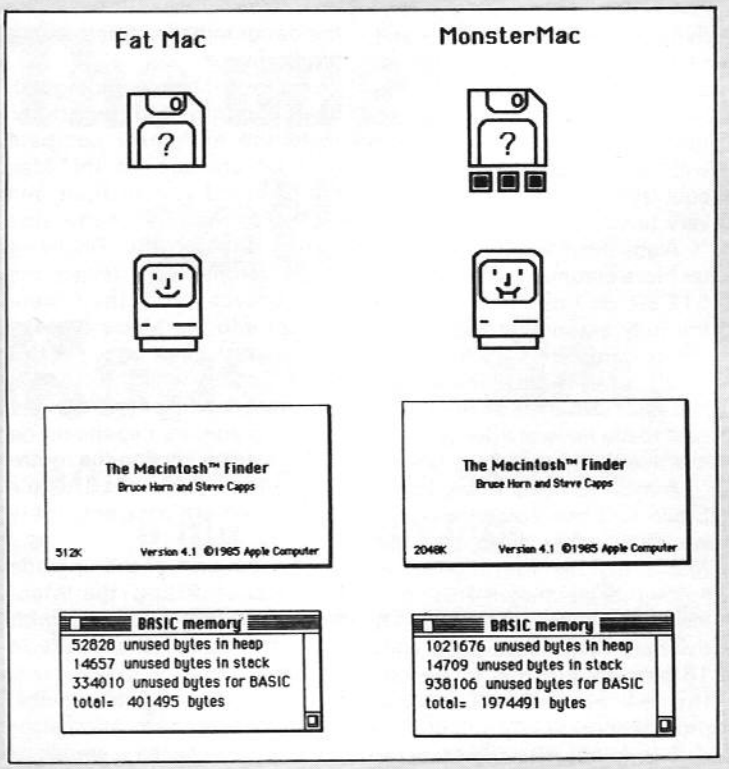

Figure II: Is it a Monster Mac?

The next trial was to see how much improvement could be made, again using the RAM disc when cutting and pasting between MacWrite and MacPaint.

I measured the time it took to save a MacWrite document, close and quit, then open a MacPaint document, select and copy part of this, paste it back into the MacWrite document, and finally save it.

The time reduced from 3 minutes 15 seconds to about 45 seconds – in other words a factor of 4. In practical terms this makes a great difference – it hardly gives you time to think. Mind you, any document must eventually be saved on a real disc, otherwise a lot of hard work disappears when the Mac is finally switched off.

Now it was time to put the system really to the test. The above cutting and pasting between MacWrite and MacPaint was repeated, but this time Andy Hertzfeld's Switcher was used to switch between the applications.

Both MacPaint and MacWrite and their respective documents were copied onto the RAM disc, together with the Switcher. Even with half the Monster Mac's RAM being used for the RAM disc, we still had room for seven 128k partitions in the Switcher.

So the Finder was installed in the first, and MacWrite and MacPaint in the second and third respectively – both with their document attached.

With the Switcher it is possible to choose between the abrupt and the animated change – I generally use the latter as it seems to add less than half a second to the changeover from one application to the other.

When I repeated the above benchmark, the time was reduced from the impressive 45 seconds using the RAM disc, to a staggering 19 seconds when using the combination of the RAM disc and Switcher – more than 10 times faster than using floppies! Now it's getting to the stage where the time taken is very much determined by how adept you are at using the Mac's mouse.

The last little exercise hardly seemed to strain the Monster Mac at all, so now came the time to pay a visit to my friends at Knowledge Ltd in Chester-le-Street, and see what they had in the way of Fat Mac software packages.

We configured the system with Jazz, Omnis 3 and Pagemaker, and still had room for the Switcher and a RAM disc.

It really was an impressive set-up, and it's worth mentioning that many of the larger programs really do run faster with the extra memory – not just because of tricks like using the RAM disc, but because the 68000 executes fewer wait-states in the Monster Mac compared to a 512k.

As well as cramming several biggies into the 2mbyte RAM space another profitable line to follow is that of adding a lot more accessories to the desktop.

Applied Technology kindly loaned me several packages such as MacTracks and Work.n.Print, from Assimilation. By the time I'd added these to the ones I already had, including some of the better public domain stuff, I had a desktop absolutely bristling with tools – and still plenty of room for my favourite program combinations and a RAM disc.

Many commercial programs are written to recognise extra memory that is contiguous with that in the 512k Mac. In other words, the programs conform to the guidelines that Apple has laid down in anticipation of larger memory. For example, we've already seen that Microsoft Basic uses all the available memory of the Monster Mac.

Another program that seemed to benefit from having the extra memory was the recently-introduced LogiMac digital logic design aid. The extra memory allows the simulation of circuits of much greater complexity than would otherwise be possible.

Not all programs are so carefully written, and some programs – especially games and some of the public domain stuff – just can't function properly with the 2mbyte memory. To cope with this eventuality the Monster Mac has a 512k mode.

This is invoked by pressing the Interrupt switch – the rearmost half of the Programmer's switch – while the Monster Mac is sounding its bong, in other words on

power-up, or after pressing the Reset half of the Programmer's switch.

In the 512k mode the extra 1.5mbyte of memory is ignored, as confirmed by the subsequent absence of the little filled-in boxes underneath the disc icon, and the lack of fangs on the happy face while the disc is loading. The Mac is then, to all intents, a standard Fat mac, and so the programs run properly.

This little touch demonstrates that Levco has a real understanding of the Mac – it also means that it's easy to do side-by-side comparisons between a 512k Mac and a Monster Mac, on the same machine.

At the end of the day, the Monster Mac adventure has been very exciting. Levco's upgrade has transformed the Mac into the kind of machine that it should have been all along.

With so much memory there is much room for experimentation – some programs, by themselves, make full use of the extra capacity, while others still dive into the disc at every opportunity.

In the latter case the sensible course of action is to use a RAM disc with its much faster access time. To fully exploit the cut-and-paste facilities the Switcher is a must and, with 2mbyte of memory there's still plenty of reserve for goodies like print spoolers, keyboard enhancers and other desktop accessories.

You have at last the potential to transform the Mac into a really effective workstation, tailored precisely to your needs, and limited only by your imagination.

Monster and the Mac Plus

WHILE this article was in an advanced stage of preparation Apple announced the Macintosh Plus, and it would therefore be appropriate to make a few comparisons between this and the Monster Mac.

As far as memory is concerned the Monster Mac's 2mbyte of memory, which is available now, is intermediate between the 1mbyte that is currently offered on the standard Mac Plus and the 4mbyte that will be offered when the 1 mega bit DRAM chips become readily available.

The new 128k ROM – and all the additional features that this provides, such as the new hierarchical filing system – is available as an upgrade from Apple to 512k Mac owners, together with the 800k internal disc drive.

The latest version of the Monster Mac works just fine with Apple's new ROM, and owners of the original Monster Mac can update to his version for only $25.

One of the most important features of the Mac Plus is the SCSI interface. The Monster Mac board doesn't have this feature, but instead it makes available the entire address, data and control bus from the 68000 on an expansion connector. This means that it has the potential to interface to almost anything, and Levco has designed a small add-on board to provide the SCSI interface.

It is worth noting that, as an alternative to the soldered-in Monster Mac upgrade, a clip-on version has recently been introduced, which can be fitted quickly and easily. It costs around $100 extra, but many owners will prefer to pay this to avoid all the cutting and soldering.

Also it isn't necessary to first upgrade from 128k to 512k before fitting it.

The conclusion one can draw is that Levco's upgrades provide a different path towards an end product that is compatible with Apple's, and offers one or two additional advantages, such as faster RAM access and greater potential for even further expansion.

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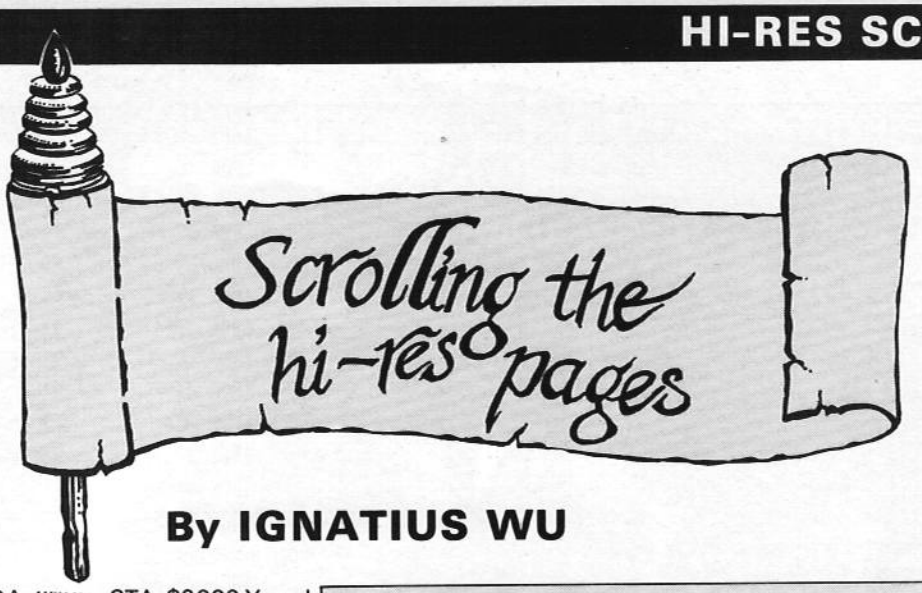

By IGNATIUS WU

AN Appletip in the February 1984 issue of *Apple User* featured sideways scrolling of the text screen. The program listings here, however, allow you to scroll the hi-res pages.

Calling 27461 ($6B45) will tear your hi-res page into left and right halves and scroll them off the screen.

Calling 27544 ($6B98) will reassemble a picture from page two to make a perfect seamless joint. Either scroll takes less than 0.7 second.

The job involves peeking the contents of each of the 192 bytes in each of the columns of the page, and poking it into an adjacent location, just for one single flicker of the screen.

Speed is so critical that attempts incorporating complete table lookup algorithms have turned out to be too slow to handle thousands of byte transfers with the 1MHz 6502. You would definitely be impatient and notice traceable byte movements.

In order to achieve an acceptable speed I avoided using indirect indexed addressing and frequent loopings in my program. The Basic program in Listing I will generate three speedy absolute, indexed machine language routines.

The first is for shifting a column of 192 bytes to one side – LDA $2000,Y, STA $2000,X, and so on. The second erases the remains after each scroll – LDA £$00, STA $2000,Y and so on, and the third inserts a selected column from page two into one side of the screen – LDA $4000,Y STA $2000,X and so on.

After you have run the program these routines should have been generated from $6000 to $6B44.

Access the monitor and type in the machine language section starting at $6B45 which controls the visits to the subroutines within suitable boundary conditions as seen in Listing II.

You should now combine the two parts together to form the final program – BSAVE PAGE SCROLL, A$6000, L$BF9.

One possible drawback of the program is its size, but whenever you have too many locations lying idle inside your Apple it does help keep them alive.

Listing III shows a simple program to demonstrate the effect. Insert your own picture names in lines 10 and 20 and make sure the files containing them are on the disc in the drive, together with the page scroll file.

Listing I

```
1  REM
2  REM  GENERATE MACHINE
   CODES
3  REM
5  DIM L(24),H(24)
10  FOR I = 1 TO 24: READ
   L(I): NEXT
15  REM   LOW BYTES
20  DATA
   0,128,0,128,0,128,0,128,40
   ,168,40,168,40,168,40,168,
   80,208,80,208,80,208,80,20
   8
30  FOR I = 1 TO 24: READ
   H(I): NEXT
35  REM    HIGH BYTES
40  DATA
   32,32,33,33,34,34,35,35,32
   ,32,33,33,34,34,35,35,32,3
   2,33,33,34,34,35,35
44  REM
45  REM   GENERATE SHIFT
   ROUTINE
60 A = 24576: FOR I = 1 TO
   24: FOR J = 0 TO 7: POKE
   A,185: POKE A + 1,L(I):
   POKE A + 2,H(I) + J * 4:
   POKE A + 3,157: POKE A +
   4,L(I): POKE A + 5,H(I) +
   J * 4:A = A + 6: NEXT
   J,I: POKE A,96
75  REM
80  REM   GENERATE ERASE
   ROUTINE
100 A = 25729: POKE A,169:
   POKE A + 1,0:A = A + 2:
   FOR I = 1 TO 24: FOR J =
   0 TO 7: POKE A,153: POKE
   A + 1,L(I): POKE A +
   2,H(I) + J * 4:A = A + 3:
   NEXT J,I: POKE A,96
185  REM
190  REM  GENERATE INSERT
   ROUTINE
210 A = 26308: FOR I = 1 TO
   24: FOR J = 0 TO 7: POKE
   A,185: POKE A + 1,L(I):
   POKE A + 2,H(I) + 32 + J
   * 4: POKE A + 3,157: POKE
   A + 4,L(I): POKE A +
   5,H(I) + J * 4:A = A + 6:
   NEXT J,I: POKE A,96
230  END
```

Listing II

```
0800                1 ;**************************
0800                2 ;*                        *
0800                3 ;*  HI-RES  PAGE SCROLL   *
0800                4 ;*  ------------------    *
0800                5 ;*                        *
0800                6 ;*        BY I.WU         *
0800                7 ;*                        *
0800                8 ;**************************
0800                9 ;
0800               10 ;
6B45               11          ORG $6B45
6B45               12 ;
00FF               13 Y1       EPZ $FF
00FE               14 Y2       EPZ $FE
00FD               15 N1       EPZ $FD
00FC               16 N2       EPZ $FC
00FB               17 L1       EPZ $FB
00FA               18 L2       EPZ $FA
6000               19 SHIFT    EQU $6000
6481               20 ERASE    EQU $6481
66C4               21 INSERT   EQU $66C4
6B45               22 ;
6B45               23 ;        SCROLL PAGE 1
6B45               24 ;
6B45 A9 01         25          LDA £1
6B47 85 FF         26          STA Y1
```

```
6B49 A9 26      27          LDA £38
6B4B 85 FE      28          STA Y2
6B4D A9 13      29          LDA £19
6B4F 85 FD      30          STA N1
6B51 A9 14      31          LDA £20
6B53 85 FC      32          STA N2
6B55            33  ;
6B55 A4 FF      34  SHF     LDY Y1
6B57 A6 FF      35          LDX Y1
6B59 CA         36          DEX
6B5A 20 00 60   37          JSR SHIFT
6B5D A4 FE      38          LDY Y2
6B5F A6 FE      39          LDX Y2
6B61 E8         40          INX
6B62 20 00 60   41          JSR SHIFT
6B65            42  ;
6B65 C4 FC      43          CPY N2
6B67 F0 07      44          BEQ ERA
6B69 E6 FF      45          INC Y1
6B6B C6 FE      46          DEC Y2
6B6D 4C 55 6B   47          JMP SHF
6B70            48  ;
6B70 A4 FD      49  ERA     LDY N1
6B72 20 81 64   50          JSR ERASE
6B75 A4 FC      51          LDY N2
6B77 20 81 64   52          JSR ERASE
6B7A            53  ;
6B7A C0 26      54          CPY £38
6B7C F0 0F      55          BEQ EDGERA
6B7E C6 FD      56          DEC N1
6B80 E6 FC      57          INC N2
6B82 A9 01      58          LDA £1
6B84 85 FF      59          STA Y1
6B86 A9 26      60          LDA £38
6B88 85 FE      61          STA Y2
6B8A 4C 55 6B   62          JMP SHF
6B8D            63  ;
6B8D A0 00      64  EDGERA  LDY £0
6B8F 20 81 64   65          JSR ERASE
6B92 A0 27      66          LDY £39
6B94 20 81 64   67          JSR ERASE
6B97 60         68          RTS.
6B98            69  ;
6B98            70  ;       SCROLL PAGE 2
6B98            71  ;
6B98 A9 13      72          LDA £19
6B9A 85 FD      73          STA N1
6B9C A9 14      74          LDA £20
6B9E 85 FC      75          STA N2
6BA0 A9 00      76          LDA £0
6BA2 85 FB      77          STA L1
6BA4 A9 27      78          LDA £39
6BA6 85 FA      79          STA L2
6BA8            80  ;
6BA8 A4 FD      81  EDGINS  LDY N1
6BAA A2 00      82          LDX £0
6BAC 20 C4 66   83          JSR INSERT
6BAF A4 FC      84          LDY N2
6BB1 A2 27      85          LDX £39
6BB3 20 C4 66   86          JSR INSERT
6BB6            87  ;
6BB6 A5 FB      88          LDA L1
6BB8 85 FF      89          STA Y1
6BBA A5 FA      90          LDA L2
6BBC 85 FE      91          STA Y2
6BBE            92  ;
6BBE A4 FF      93  SHF2    LDY Y1
6BC0 A6 FF      94          LDX Y1
6BC2 E8         95          INX
6BC3 20 00 60   96          JSR SHIFT
6BC6 A4 FE      97          LDY Y2
6BC8 A6 FE      98          LDX Y2
6BCA CA         99          DEX
6BCB 20 00 60   100         JSR SHIFT
6BCE            101 ;
6BCE C0 27      102         CPY £39
6BD0 F0 07      103         BEQ INS
6BD2 C6 FF      104         DEC Y1
6BD4 E6 FE      105         INC Y2
6BD6 4C BE 6B   106         JMP SHF2
6BD9            107 ;
6BD9 A5 FC      108 INS     LDA N2
6BDB C9 26      109         CMP £38
6BDD F0 0B      110         BEQ LAST
6BDF C6 FD      111         DEC N1
6BE1 E6 FC      112         INC N2
6BE3 E6 FB      113         INC L1
6BE5 C6 FA      114         DEC L2
6BE7 4C A8 6B   115         JMP EDGINS
6BEA            116 ;
6BEA A0 00      117 LAST    LDY £0
6BEC A2 00      118         LDX £0
6BEE 20 C4 66   119         JSR INSERT
6BF1 A0 27      120         LDY £39
6BF3 A2 27      121         LDX £39
6BF5 20 C4 66   122         JSR INSERT
6BF8 60         123         RTS
6BF9            124         END
```

Listing III

```
5 D$ =  CHR$ (4)
10  PRINT D$"BLOAD PICTURE
   1,A$2000"
20  PRINT D$"BLOAD PICTURE
   2,A$4000"
30  PRINT D$"BLOAD PAGE
   SCROLL"
40  POKE  - 16304,0: POKE  -
   16297,0: POKE  - 16302,0
50  FOR I = 1 TO 2000: NEXT
60  CALL 27461
65  FOR I = 1 TO 1000: NEXT
66  CALL 27544
68  FOR I = 1 TO 1000: NEXT
70  FOR I = 1 TO 5: CALL
   27544: NEXT : GOTO 60
```

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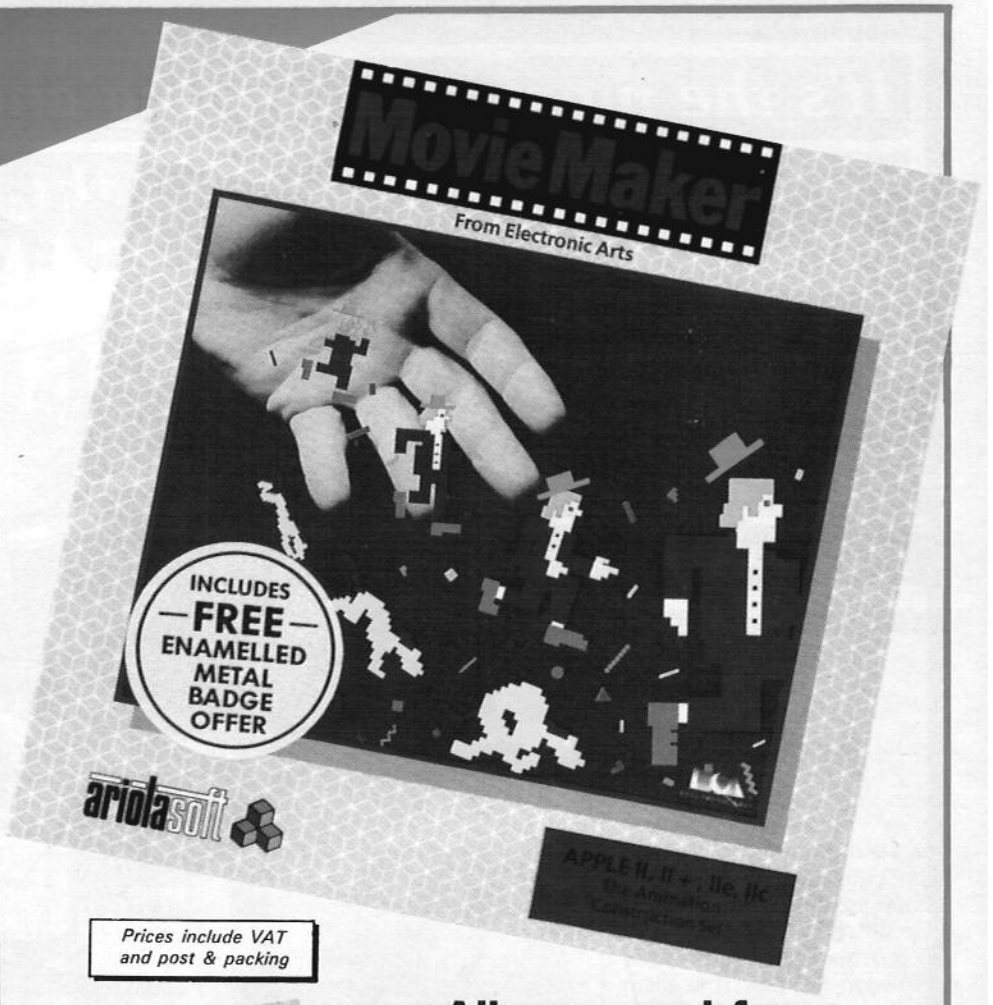

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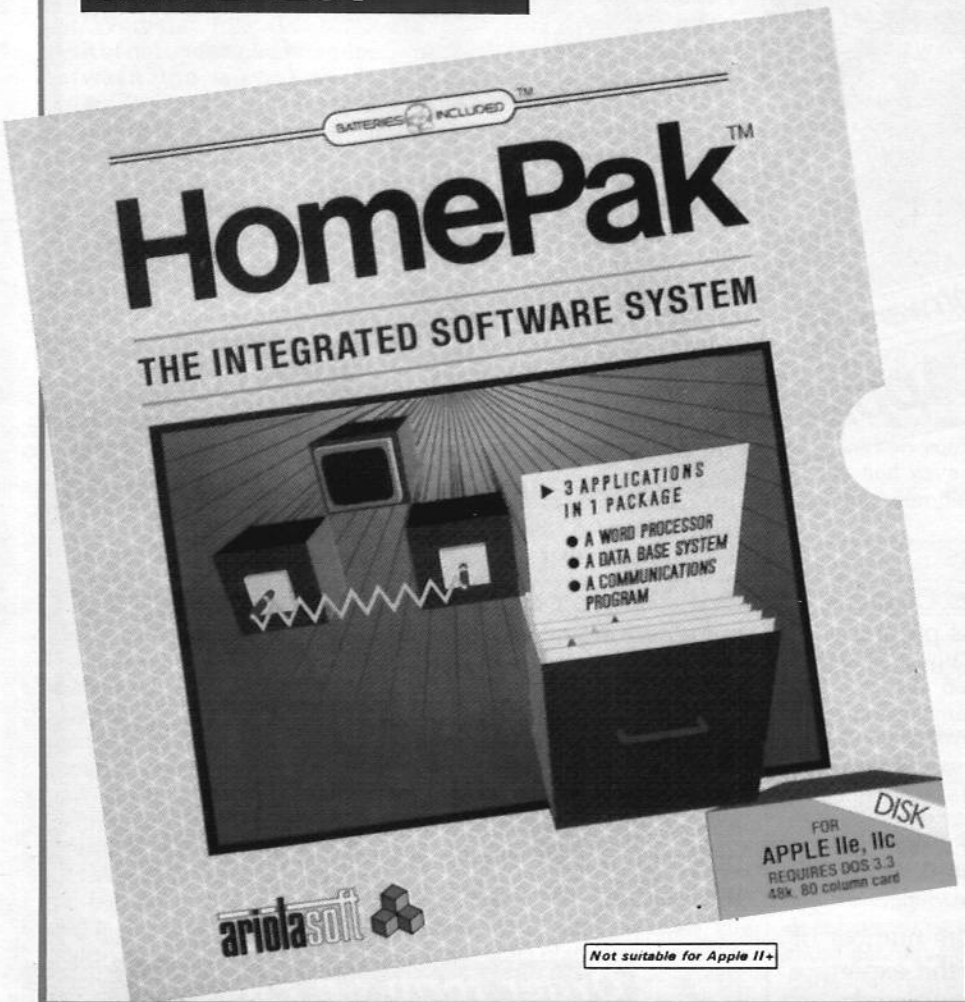

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Order form on Page 61

We have ways of making Wordstar really chatter

Hints and tips to make the most of this popular word processor from PETER WILSON

THERE are so many commands, including dot commands, in Wordstar that the tendency is to learn only enough to get by in order to write that letter or the odd document, and ignore the real power of this famous – some would say infamous – word processor.

I would like to take you through some hints and tips to make your life easier, and the production of that document or letter made with less fuss and bother.

Throughout this article I have used the ^ (up arrow) to indicate the Ctrl key, that is ^PQ means press the Ctrl key and P together, followed by Q. I have also used [CR] to indicate you are to press the Return or Enter key.

Take underlining for example. Did you realise that there are three ways to create an underline? The first and normal method is to use the^PS command before and after the portion you want to underline.

This is fine for only one word, but Wordstar has the nasty habit of not underlining the gaps between the words, which results in a very unprofessional looking document.

An improvement on this is to fill in the gaps with the underline key as you type the words in your document, for example this_must_be_paid_immediately.

But this also has the drawback that Wordstar looks at the underlined portion as one word, and microjustifies it accordingly, which results in the underlined words all grouped together unnaturally, with big gaps between the remaining words on the same line.

A far better method for multiple words is to type your document and then return to the portions you wish to underline. Move the cursor to the end of the line you want all, or part of, underlined and press ^P [CR]. This results in a bar on the far right of your screen, and an apparent gap in your document.

A [CR] is actually two commands, a line feed and a return. What has happened is that Wordstar has been instructed by you not to execute the line feed, but to carry out the return on your printer when it reaches the end of the line with the bar in it, which results in the machine printing the next line on your screen over the one just printed.

If we now underline any part of the document with the underline key it will underline the line above, and you still keep microjustification throughout your document.

No extra lines are added or used in your document by this method, as you can see if you move the cursor up the screen over the portion just underlined, while watching the line count at the top of the screen.

Another trick using the ^P [CR] is to insert comments or a special ruler into your document (the line at the top of the screen which starts L---!----!).

If you require a special ruler for a document which is often updated or changed, you can store your special ruler anywhere in your document and change from the default ruler with just one command.

To do this we use the Comment dot command which is two dots in the first column of your document followed by the ubiquitous ^P [CR].

On the next line down create your special ruler starting it with a capital L, using the exclamation mark ! for tabs, the hash sign for decimal tabs and filling in with the minus sign –. Finish the right hand side with a capital R, and end with a [CR].

You should now have a different version of the normal ruler ready for use. Now, and when you first reopen the document, place the cursor on the new ruler and press ^OF. Your new ruler has now replaced the default ruler.

As the double dot command is followed by our ^P [CR] Wordstar looks at the line with our special ruler on it as an extension of the comment command and will not print it, or count it as lines used in your document.

You can insert any comments after the double dot command, as Wordstar will ignore anything you write afterwards. It is a good idea to have a copy of the default ruler on disc as a file, so that you can return to the default ruler at any time.

You can accomplish this by opening a file called, say, DEFAULT.RLR and begin a new line with our double dot command, followed by the ^P [CR].

Enter ^Z repeatedly until you are under the ruler on the screen. Copy the ruler exactly as seen. When you get to the end of the line save the file with a ^KD for example:

```
..                Anything here will not be printed                -
L----!----!----!----!----!----!----!----!----!----!----!--------R
```

Now any time you want to return to the default ruler you only have to enter ^KR to read a file, enter DEFAULT.RLR, position your cursor over the ruler and enter ^OF, and you are back to the default ruler.

Most people do not use the ^QF – Quick Find – command often enough. Use it to find any occurrence in a document – the more definitive the better – and if the first Find is not the one you want use the ^L to repeat the parameters you set up for your Find.

Save key entry if you do not require to enter any of the options, by hitting Escape after answering the question Find? – instead of two carriage returns.

If you were a bit too quick hitting the ^L command, and realised it was the occurrence you were looking for, use the ^QP command to return to the last cursor position, which saves starting over again.

There is one way Find can help to overcome a limitation in Wordstar, and that is the apparent inability to go straight to the top of each page break in your document.

Let's say you have a 10 page document, and you have to insert, say six or seven lines in the middle of the first page. No problem so far – you just make sure you are in the insert mode (^V) and type away.

What about all that careful page control you did when you first set the document out though, with the headings in just the right place? You will want to check/change this now as well, and this can prove to be a bore, with about three and a half ^C commands to be input for every page you have to look at.

You can use Find to make this task much easier. Enter ^QF and to the question Find?, enter a ^N. Enter a [CR] and under the options enter 55 – this figure

could be different if you are using 12in paper.

Wordstar will now look for the 55th occurrence of a return in your document. If you look at the far right of any Wordstar document, file or letter you will find file indicators.

A < means a hard return, a single dot a line after a document, a colon indicates a line above the document, and a + indicates there are words or letters to the right of the current display.

A blank means a soft or reformattable return, that is, if you add or delete a letter or word from the middle of a paragraph and reformat with ^B, the words will be shuffled into the new order up to the next hard return.

The command you entered was to Find ^N – a return, hard or soft – and to Find the 55th occurrence of a return. A normal page is 55 lines of text plus a header and footer for other uses, and we can use this to find the top of all of your pages to check if they need changing.

Another use for Find is the checking of the print switches. When you want to print double strike (^PD) or bold strike (^PB), you must start and end each section you want highlighting with the appropriate ^P command.

If you inadvertently miss one of the switches, instead of highlighting the parts other beers cannot reach, all the text between the intended parts you wanted to highlight are highlighted instead.

To check a long document use Quick Find (^QF) and Find (if you are checking bold strike) ^P^B (this will make sure the Find is in upper case) and enter, say, 10 – or any even number – and Find should locate the off switch of a bold strike pair of switches.

If you have not come to the end of your document enter ^L and Find will locate another off switch. If you are positioned at the on switch at any time then either an off or on switch is missing.

You can return to the previous correct position, where Find found the the off switch, by entering ^QP – return to previous cursor position – and asking Find to locate every other switch by entering a 2 to the options section until you find the missing switch.

Correct your mistake and start Find off again asking it to locate every eighth or any even number of ^P^B.

A variation on this theme is to use Find to check out a mailmerge data file for you.

If you use Datastar or any Ascii output from a database to create a data file for use with mail merge, then the correct number of field separators – normally the comma – is automatically input for you.

On the other hand, if you use the non-document mode to create the data file you will need to check that every single line has the exact number of commas in each line, or either the wrong information will be printed or the line will be ignored altogether.

The number of commas per line is equal to the number of fields minus one – so 12 fields means 11 commas.

To check out a data file with 12 fields try the following. Enter ^QR to go to the home position. Enter ^QF, [CR] 11 [CR]. This will move the cursor to the last comma on the first line.

Entering repeated ^Ls will check the number of commas on each of the lines in your data file. If the cursor ever stops on a comma that is not the last in that line, then either a field is missing from that line, or you have embedded commas within a field (which must be enclosed in double quotation marks).

Once you have checked out a line which is incorrect move the cursor to the end of that line with ^QD before pressing ^L again.

If you have a large data file you can, of course, enter multiples of the number of commas in a line, so 110 will check every 10 lines in our example.

Once a mistake is found, entering ^QP and then refinding a lower number – 11 – will check out each line until you find the line with the mistake in it.

If, when using Find, you are not quite sure how you spelt the word you are looking for use the wild card of ^PA – I know you thought it was to change the print to an alternative pitch.

If you are looking for fi?? – the ? being unknown – enter ^QF fi^PA^PA [CR] and Wordstar will locate all instances of words starting with fi.

You can also use this to find figures within a range by using ^QF 2^PA^PA [CR] W [CR] to find all numbers within the range of 200 to 299.

Yet another tip for Find is to create a standard heading complete with bold and double strike switches, which can be read in from disc (^KR), and used as a template.

If you are the Bloggs Computer Emporium you could create a file on disc called B – use a simple file name such as B – to speed up your processing as in Figure I.

You can now ^QF the ~ and enter the details – make sure you have insert off – overwriting the tilde as you proceed, and jumping directly to the correct place with the (^L) repeat last Find command.

Find & Replace (^QA) can also be used to good effect. Incidentally the Number option works in a different way with Find & Replace than with Find only.

With Find it will find the nth occurrence, whereas with Find & Replace it means replace the nth occurrences – an important difference.

When using Find & Replace in a file where you know there are no undesirable matches, use the N and G options. If your file is large or wider than the screen display Wordstar needs to display the occurrence on the screen before carrying out the Replace part, and then finds the next occurrence.

A way to vastly speed up this type of operation is to wait for the first replace to take place – just to check that everything is all right – and then hit Escape. Wordstar will apparently hang, but don't worry – it is finding and replacing it all in memory, speeding the operation up by a factor of 300 or 400 per cent.

Another way of using Find & Replace is if you are entering a long document and have to enter, say, "the third party" several times.

Instead of entering the same sentence again and again, just enter @. When you have finished your document – you can use several different symbols to represent other paraphrases – use Find & Replace to exchange the @ for "the third party", using the G (Global) and N (No ask) options.

Then reformat using the ^QQ^B 1 command ^QQ, repeat until spacebar pressed, ^B, reformat, and 1 to 9 for the speed of operation. 1 is fast, 9 is leisurely.

Enter all the commands together to suppress the screen display during the Find & Replace mode as: ^QA @ [CR] the third party [CR] GN [CR] ^KS ^QQ ^B 1 [CR] and this will Find & Replace Save & Return to the top of the file, and reformat the document ready for saving and printing.

Prevention is always better than cure, and I would like to talk about both how to prevent disasters and hopefully how to get out of them once you have got yourself into them.

There are two areas of storage used by Wordstar, the floppy disc for permanent storage and the RAM for a buffer storage.

When you fill the buffer area, which can be quite large, Wordstar automatically transfers the overflow to a temporary

```
^BB L O G G S  C O M P U T E R  E M P O R I U M^B

^DM E M O R A N D U M^D

-------------------------------------------------------------

^BFROM:^B ~                              ^BTO:^B ~
          ~                                      ~

^BREF:^B ~          ^BDATE:^B ~          ^BCOPIES TO:^B ~
=============================================================
```

Figure I

file on disc, with the same name as the file being edited but with a $$$ extension which is the optional three characters after the decimal point.

Normally, you never see the temporary file because as you save the completed file Wordstar renames your original file with a BAK extension – if there was a BAK file already in existence it deletes it first – and renames the $$$ temporary file to your original file name.

If your file is small, say four or five pages, it will all sit in the buffer and be vulnerable to any power failure or general mishap which could befall you. To safeguard your precious work do frequent saves using the ^KS ^QP command.

If you have version 3.3 or better of Wordstar you will be able to use the Open and Closed Apples together with a number from 1 to 0 as function keys, all of which are user programmable, so that when you are required to stop for a few seconds you can save your work with the press of just two keys.

If you do have a power failure or worse during the editing of a large file you may find that the $$$ temporary file is the most up to date, so check it out before deleting it.

When Wordstar first opens your file it will load a part of your file into its work area for you to work on, and create the $$$ file. As you continue to edit your file and fill the buffer any overflow will be written out to the $$$ file.

You will need to rename the $$$ file to something else before you can edit it, to check to see if it is the most up to date – I would suggest Temp. If it is the most up to date delete your original, rename Temp to your original name, and just continue.

With Apple's small disc capacity, and Wordstar creating BAK and $$$ files of your editing, sooner or later – probably sooner – you will experience the DISC FULL error.

The first thing Wordstar will do is to delete the BAK file to make room for your file, and display a warning to that effect on the screen.

To attempt to recover from this situation first look at the disc directory with the ^KF command. This is also a switch, and is turned off with another ^KF command.

Delete any old BAK file with the ^KJ command, or indeed any old or unwanted files on your disc. If you need all the files try transferring any you are not currently working on to another disc.

But beware of changing discs, as CP/M – the operating system you are using – requires you to log in a new disc with a ^C, which you cannot do from within Wordstar.

Try copying a file to drive B if you are logged on to drive A with the ^KO command, and if you are successful delete it with the ^KJ command.

Another possible way out is to block mark the updated part of the document using ^KB and ^KK, assuming that the updated portion is all in one place, and write it to the non-logged in disc using the ^KW command.

You can then abandon this editing session with ^KQ, make some room on your disc and start again, reading in the saved portion with ^KR.

As a last ditch effort put a new disc in the non-logged in drive, and try to copy any file to it. Sometimes it will work, more often than not you will get a BDOS ERROR and lose your file – the updated version in memory only.

To prevent this, always have 50 to 60k of space on your discs before editing a file, and do frequent backups with the ^KS ^QP commands.

The obvious end product of a word processor is the printed document, and the daisywheel still rules the waves as far as business and professional letters and documents are concerned. Unless you alter the default settings in Wordstar it assumes there are 66 lines on each page with a three-line margin at the top and a bottom margin of eight lines, leaving 55 lines for your document.

```
.CW8  =  120 divided by 8  =  15   cpi
.CW10 =  120 divided by 10 =  12   cpi
.CW12 =  120 divided by 12 =  10   cpi
.CW14 =  120 divided by 14 =  8.6  cpi

.LH5  =   48 divided by 5  =  9.6  lpi
.LH6  =   48 divided by 6  =  8    lpi
.LH7  =   48 divided by 7  =  6.9  lpi
.LH8  =   48 divided by 8  =  6    lpi
.LH12 =   48 divided by 12 =  4    lpi
.LH16 =   48 divided by 16 =  3    lpi
```

Figure II

These can be altered by the dot commands for page length (.PL), margin top (.MT) and margin bottom (.MB). Wordstar always obeys the formula of:

Number of printed lines = PL – (MT+MB)

If we want more or less than the default we can alter the page length of the margins, but you must stick to the formula if you are using 11in paper.

The next thing to consider is that the majority of daisywheel printers move across the paper in increments of 1/120th of an inch, and vertically down the paper in increments of 1/48th of an inch.

You can control the character width and line height by the two dot commands .CW and .LH. The defaults are a character width of 12 and a line height of 8, and these produce 10 characters to the inch – 120 divided by 12 = 10 – and six lines to the inch – 48 divided by 8 = 6. We can therefore produce a table of characters per inch (cpi) and lines per inch (lpi) as shown in Figure II.

The three most used character widths are CW12 for 10 pitch, CW10 for 12 pitch and CW8 for 15 pitch. Similarly, LH8 is used for 10 and 12 pitch and LH6 for 15 pitch fonts. You can mix and match these fonts for a greater degree of control to help you get that little extra out of your printer.

If, for instance, you must have the letter on one page and try as you may it still overflows on to page two, try CW9 with a 12 pitch wheel. This will give you at least one more word per line without crunching them up too much, and LH7 is just acceptable for the line height.

A little known and undocumented command is the ^PP command which can be used for any printer that has proportional spacing, such as the Brother HR series.

If you have a proportional wheel for your daisywheel printer try ^PP and Wordstar will proportionally space the spaces between the characters as well as the spaces between the words. This looks even better than microjustification, which can leave large spaces between words on a line.

The reason for getting to know a word processor is to speed up your work, and I would now like to turn our attention to this.

Word processing is far superior to the humble typewriter in several ways. Firstly it has the ability to add, delete or rearrange the contents. Secondly, there is the greater throughput

```
                          Bloggs Computer Emporium
                          23 Stowmarket Street
                          Anne Industrial Estate
                          Thetford
                          Norfolk NR22 1DY

Ref:                      Tel: (STD 094) 234-2981


Dear
```

Figure III

which the user can achieve by less repetition of common words, phrases or even pages of words. This is known as boilerplating and can be used to great effect in speeding up your work.

For my first example you could have a file with today's date in it, which is saved after editing every morning with the name of, say, D. Any time you want to enter the date in a document or letter you would only enter four key strokes (^KR D [CR]), instead of 18 (10th December 1985).

To take this one stage further you can have your business or home address stored on disc as B for business and H for home address, which can be read into your workspace – again with four key strokes instead of dozens – without making a mistake – see Figure III.

We could also have another to finish the letter off as in

```
<CR>
<CR>
Yours sincerely,
<CR>
<CR>
<CR>
<CR>
Peter F. Wilson
Senior Consultant<CR>
```

Figure IV

Figure IV, again saving umpteen repetitive and boring words which can be read into your file by just four key strokes.

Moving quickly from place to place in your document can save time again and again. For instance pressing ^B will move you to the end of your current paragraph faster than repeated ^Xs.

Don't use ^QR to get to the beginning if you are at the end of a large document which is unchanged. Abandon and re-edit the same document with the ^KQ D ^R series of commands, which is ^KQ Abandon, D open a document file and ^R repeat last file name edited.

The ^R can also be used to good effect when printing out your work by entering P ^R – the ^R command will sometimes display the file before the last edited, which can be annoying, but is easily cancelled by ^X.

If you have version 3.3 or greater and own an Apple IIe you have the opportunity to make your own programmable keys using the Winstall program.

If for some reason you still have an Apple II+ with version 3.3 of Wordstar you can use the paddle buttons instead of the open and closed Apple signs.

Always program the most easy to operate keys with ^KS ^QP to save and resume to your last cursor position. Use it often and always when disturbed.

It takes only two keystrokes – open Apple plus a number – to save your work whereas it could take you hours to reconstruct your work, especially if you are using Wordstar to create a letter or document as you go along.

If you use Spellstar try ^B^QP^L. During the spell fix mode this will reformat the paragraph you have altered, return you to the place where you were before reformatting and Find the next word which is unknown to Spellstar.

Don't wait for one command to finish before entering another – Wordstar does have a buffer of sorts, and will store several commands for you, executing them in turn.

I hope you have found these hints interesting and will put just some of them to use. Wordstar is an extremely powerful, but vastly under-used word processor, so make it work for you.

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Sweeten the pill when swallowing balance sheets

CHRIS BURRIDGE looks at Chart, a splendid source of business graphs

MOST businessmen find balance sheets a bore. After all if there's enough profit for them to make fat drawings from their profit and loss accounts, why worry about assets and liabilities?

Unfortunately it's a necessary chore to analyse and look at the various parts of a firm's balance sheet – to spot good and bad trends. A way of sweetening the pill is to present the information in visual form. Here's a method of doing just that utilising the combined talents of Multiplan and sister Microsoft program Chart.

Chart is a flexible under-rated program with endless possibilities for creating business graphs. Apart from the 42 pre-defined gallery styles you can also create your own.

While playing with the French integrated package Ensemble I discovered an interesting built-in vertical stacked bar chart format designed to display balance sheets. As a challenge I decided to try and set up a similar customised graph using Chart – which is where my problems started.

Steve Lambert's excellent book "Presentation Graphics on the Mac" didn't really help, although it taught me a lot about Chart. The main practical difficulty lies in the way Chart pulls in data from Multiplan – Normally data is copied, pasted or linked from a selected spreadsheet portion row by row. If there are more rows than columns the data is transferred across column by column.

This works for most standard graphs. Each row or column forms a separate Chart series – a series is just a posh name for a window containing a set of data points – in whatever type you allocate from date, number, sequence or text. The various points are then simply plotted in the chosen format.

Our balance sheet needs to compare each opposing category side by side – so columns and rows are sadly not appropriate. Logically we can only input data points ark style in pairs with each pair forming a separate text series.

If default column chart format – No. 1 in column chart gallery – is then selected and plotted this should display columns, which is the bones of the shape we want.

But first let's start at the beginning the balance sheet itself. As you'll see from Figure I I've set up a typical balance sheet with all the usual labels. Normally you'd use this to study and compare trends of the same company or sole trader from year to year.

For illustration purposes the figures shown for years 1 and 2 deliberately reflect two fictional businesses of very different strengths. The model is designed so that all the key figures such as cash, debtors, borrowings and so on are copied to a work summary at the bottom.

This summary is then duplicated on to a separate spreadsheet model, Chart-B/S Link, utilising Multiplan's unique link facility as shown in Figure II.

Switched on readers will notice that this is actually done via yet another linked model, Company Ratios, which I use to analyse my balance sheet figures. This extra stage can be ignored for this article, but you do still need some data to work on.

All that's necessary is to set up the tiny spreadsheet model exactly as shown in Figure III

File Edit Formula Format Data Options Macro Window

R1C1 | HISTORICAL COST BALANCE SHEET

of

Limited/plc

20 Owing to Bank(s)			
21 Trade creditors		41762	84024
22 Corporation Tax (Current and Future)			20448
23 Hire Purchase		806	4550
24 Proposed Dividend			
25 Other Short Term Liabilities *		150	1250
26 Due To Parent/Subsidiaries/Associates			
27			
28			
29 CURRENT LIABILITIES Sub-total 20-28 (Red)		47755	134023
TOTAL LIABILITIES Total of 6,7,14,19 & 29		67246	307744
Liquid Surplus/Deficiency (Red) (difference of lines 29 & 3		2400	4438
ASSETS			
30 Cash & Bank(s)		2025	17420
31 Debtors		25890	51321

Figure I: The raw accounting data – entered in balance sheet format

File Edit Formula Format Data Options Macro Window

R24C5 | {='COMPANY RATIO"s'!R101C1:R120C7}

CHART-B/S Link

	1	2		4	5
20	1	CURRENT ASSETS	[L36]	50155	138461
21	2	CURRENT LIABILITIES	[L29]	47755	134023
22	3	GROSS PROFIT	[P&L L	32014	40963
23	4	SALES	[P&L L1	119578	149304
24	5	DEBTORS	[L31]	25890	51321
25	6	CREDITORS	[L21]	41762	84024
26	7	PURCHASES(or SALES - GP)	[P&L L18	87564	108341
27	8	STOCK	[L32]	22090	66320
28	9	INTEREST PAID	[P&L L	1256	1369
29	10	NET PROFIT	[P&L L(	-1285	32128
30	11	BORROWINGS	[L14+(	17048	105009
31	12	SURPLUS RESOURCES	[L6]	6536	89478
32	13	CASH	[L30]	2025	17420

Figure II: A work summary table of key accounting information linked to original balance sheet model

and then enter the relative figures. Notice the checklines at the base which are essential to ensure liabilities equal assets.

By deliberately using Excel's multi-window facility I've allowed you a peek at the underlying balance sheet so you can see the figures agree.

Now here's the clever bit. Just select the first pair of figures – creditors/cash in year 1 (cells D45/46) – then copy to the clipboard. Next open Chart and paste and link into a sequence series called year 1 creds/cash.

Save, then repeat with appropriate names for the other three pairs as illustrated in Figure IV.

Follow the same procedure for further years, taking care to name all series with the correct year. It's all a bit tedious but well worthwhile.

By now it's probably becoming clear why the layout in Figure III was so crucial – spaces and all, so that liabilities always appear on the left and everything was charted in correct place and order.

In this way the order of plotting follows naturally so that surplus resources, for all intents and purposes capital, and fixed assets come out on top of the pile.

And now to design the chart itself. Anyone following so far won't be too happy at having plotted 10 separate columns for each year. What is wanted is a way of layering each pair to form just two columns.

This is easy. First, simply pull down the column chart gallery and select number 5 – which is 100 per cent stacked style. Now select main chart from the format menu and copy the arrangement of Figure V – with 100 per cent overlap.

All that's left is to fix the main title (partly automatic), text category titles and add a border.

A bit of tidying up probably won't go amiss, although you may find Chart's manual features difficult to master without practice.

Your finished and printed charts should bear a passing resemblance to mine, as shown in Figures VI and VII. Anyone hopelessly lost can ring me for help on 0793 765440.

Stand back and look at the results – it's now easy to cast an informed eye and quickly see where your assets are, or rather their relative percentages.

Remember that a balance sheet is no more or less than a single day snapshot of a business. Always take most notice of year-on trends – it's therefore best to keep running records of the data and charts.

Quick visual analysis of various portions making up each side, for example comparing debtors with creditors, can save hours poring over the raw audited figures.

Once you've established and saved the graph format it's a breeze to edit or input fresh data and inspect the results.

But balance sheets must balance. So if your masterpieces show the capital chunk of your business getting smaller every year don't blame your accountant, just stop drawing and start worrying.

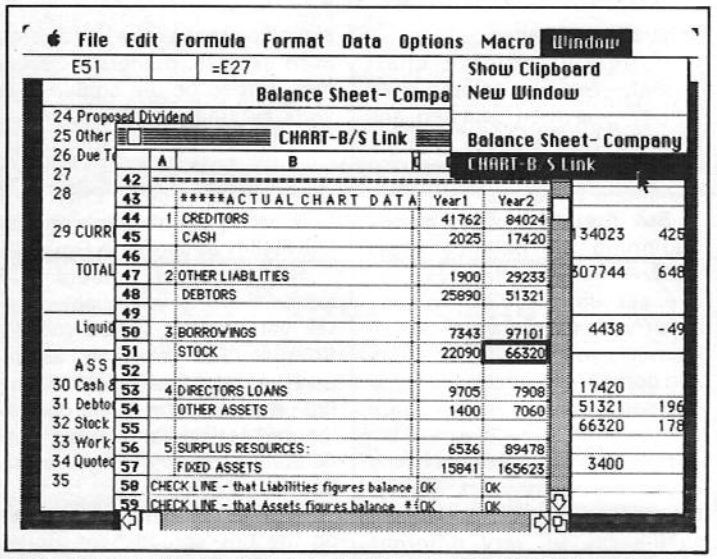

Figure III: Data linked to original balance sheet deliberately arranged uniquely in opposing pairs for direct pasting to Chart. This template may be used for raw data, skipping Figures I and II

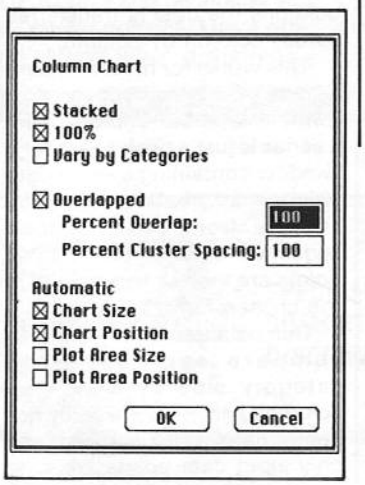

Figure V: Main column chart window showing desired option settings.

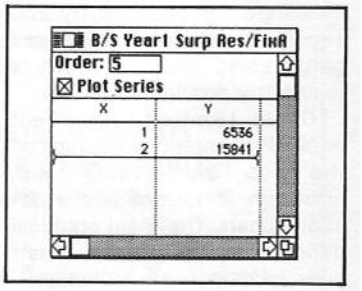

Figure IV: A typical series window showing labels, data and auto-sequence numbers generated by Chart in X column.

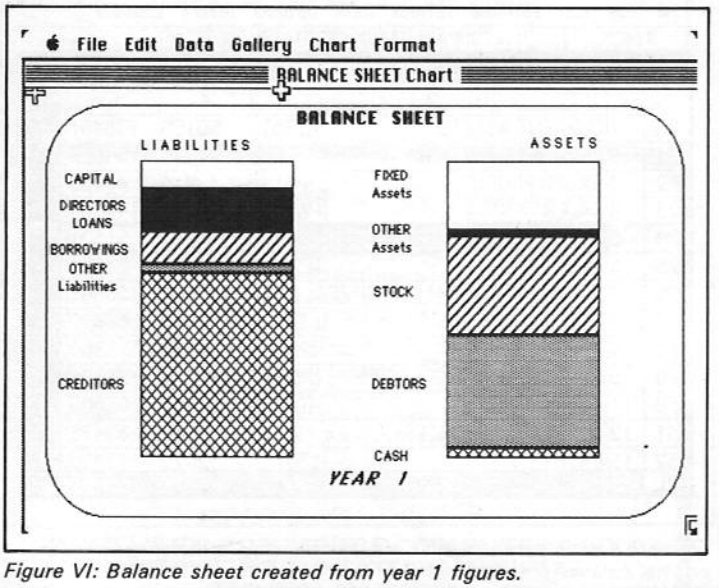

Figure VI: Balance sheet created from year 1 figures.

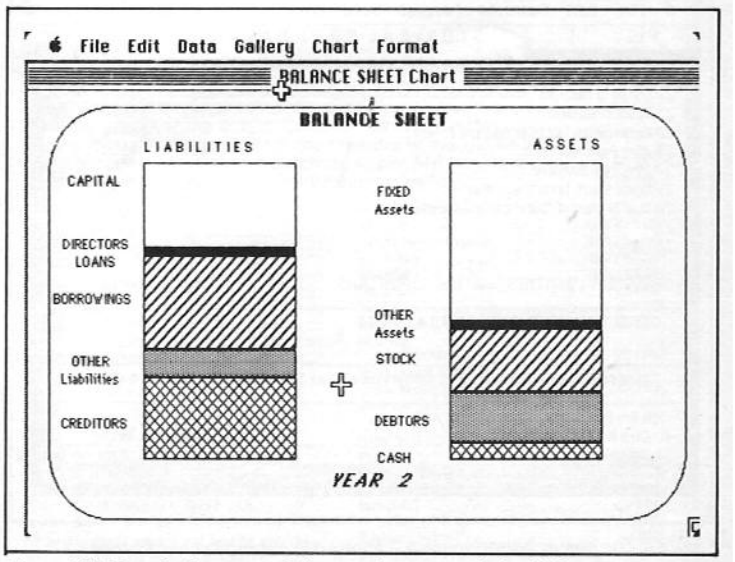

Figure VII: Results from year 2 figures show a much healthier company

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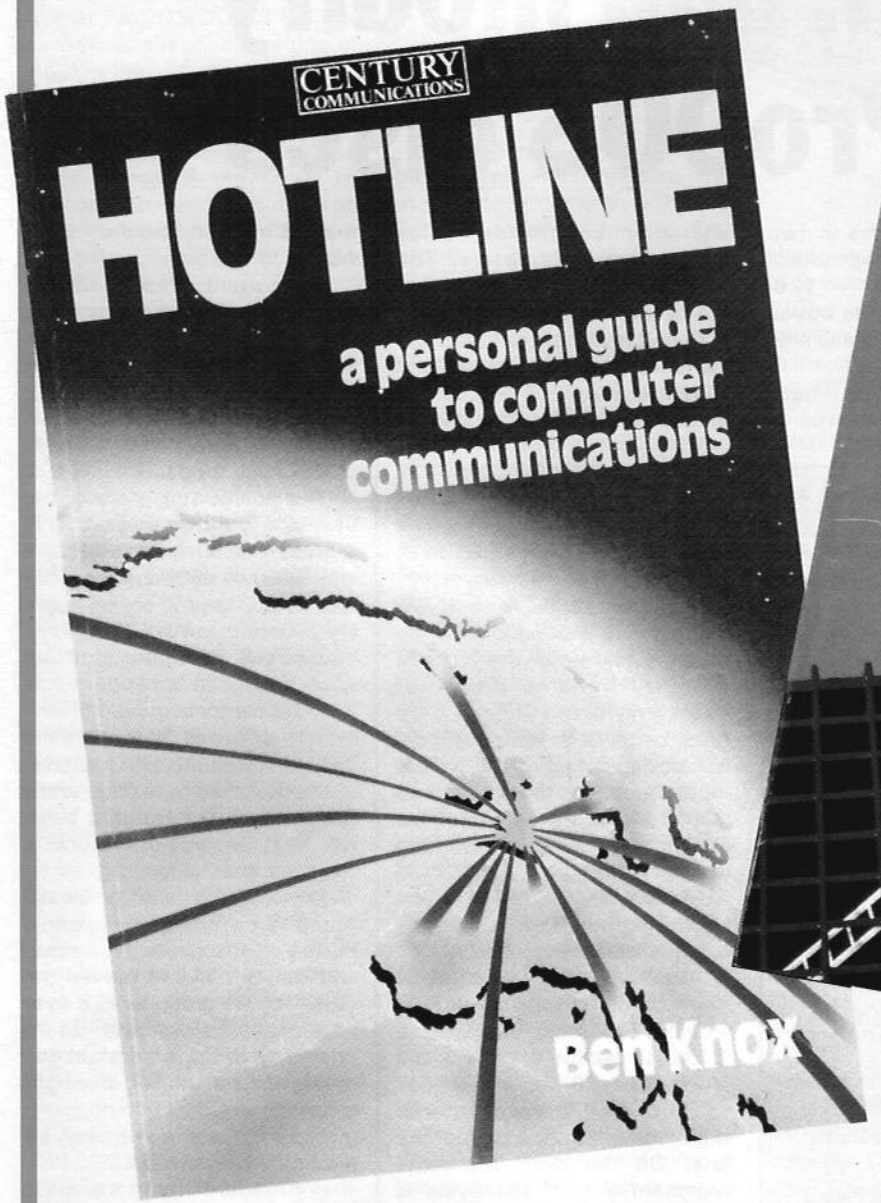

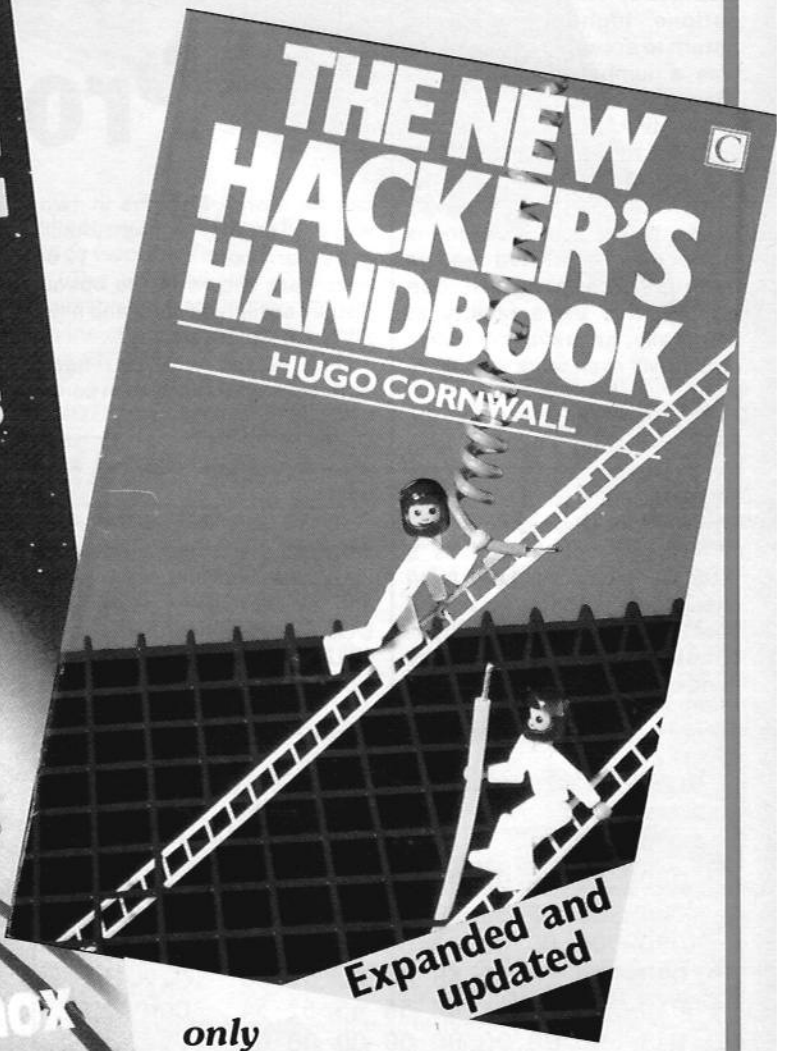

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PLEASE USE THE ORDER FORM ON PAGE 61

Zap your way in, and modify ProDOS discs

By GRAHAM KEELER

THE Zap program starts with a specification display in which three sets of choices are displayed, with the default options highlighted. Press Return to accept the defaults, or type a number from 1 to 7 to change an option.

The first choice is whether you wish to use DZAP or MZAP. The latter gives direct access, with Ascii listing, to memory rather than a disc block, and is included for interested readers because the program can provide this extra facility at practically no extra cost (this option will even work with DOS 3.3).

The second option, for the benefit of Apple II+ users, is to force an upper case listing, since on the Apple II+ lower case is displayed as gibberish.

The final option requires a little explanation. The Ascii character set comprises 128 characters, including Ctrl-codes. Since a byte holds numbers up to 255 characters can be stored in bytes in two ways – as the straight Ascii code, or Ascii code + 128, which are shown in the option display as high bit clear and high bit set respectively.

The reason why you need both possibilities is that in some cases for example, ProDOS files, one convention is used, and in other cases, particularly DOS 3.3 files, the other is used.

Use of the program proper is governed by a dozen one character commands, some with extra parameters. The commands are listed in brief at the bottom of the screen.

A command of the form S6,2 switches slot and drive to 6 and 2 respectively. The current settings are displayed in inverse at the top of the screen.

The commands Rn and Wn respectively read a block into memory and write the block of memory back to disc (not necessarily to the same block) n must be given in either decimal or hex, depending on the current input mode. The block accessed last is shown at the top of the screen. When writing, a warning prompt is first given – ARE YOU SURE? (Y/N).

Writing has no effect on the screen display, but when a block is read the first quarter is immediately displayed on the screen. The main display is a 128 byte section or page of the block in hex, 8 bytes to a line.

On the left is the offset into the block of the first byte of the line. On the right the Ascii representation of the bytes is shown where possible.

The Ascii characters can be of particular value in picking out filenames in a directory, contents of text files or variable names, strings, REMs and so on in a Basic program. An example display of the second page of block 2 of the User's disc is shown in Figure I.

To modify bytes of the block the command is a colon followed by the new contents up to a full screen line in length the bytes separated either by commas or spaces. The bytes may be input in hex, decimal or Ascii.

The current mode of entry is shown in inverse at the top right of the screen, and the single command letters H, D or A switch to the appropriate input mode. Comma or space separators are not needed in the case of the Ascii mode.

The position of entry of the next byte is shown by a cursor in the form of an inverse byte. It can be moved around by the four arrow keys – on an Apple II+, Ctrl-J and Ctrl-K are equivalent to down and up arrows respectively.

If the cursor is moved off the bottom or top of the display the display automatically switches to the next 128 byte page and if this runs off the end of a block the next or previous block is read automatically.

Pressing the open or closed Apple key – or a games paddle button on the Apple II+ – along with an arrow key moves the cursor by a complete 128 byte page for the up and down arrows, or to the left or right end of the line for the left and right arrows.

Finally, the program can be ended by pressing ESC.

For readers interested in the way that program Zap works, especially the direct call to READ_BLOCK and WRITE_BLOCK, an explanation is given in my book, "Apple ProDOS disk/file handling".

It is essential that before using Zap, you always make a copy of your whole disc, if possible, or as many files as possible, if not. Zap is a powerful program, and a mistake in using it could corrupt the whole disc beyond recovery.

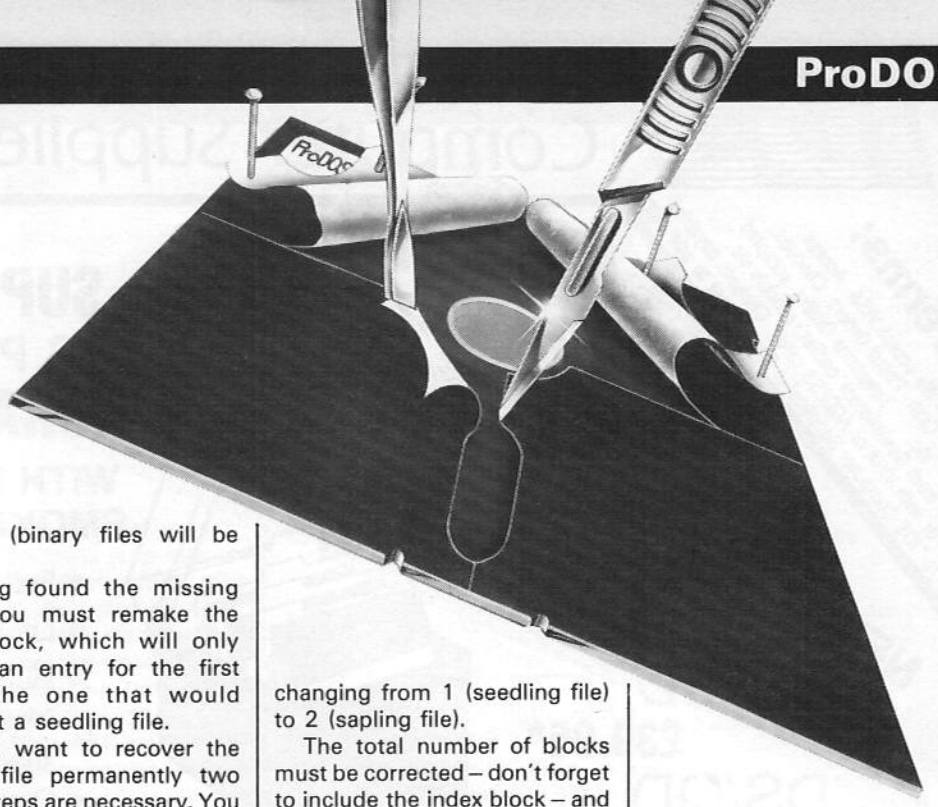
The types of task possible with Zap include recovering a

```
BLOCK: 002          S#6 D#1          HEX

                    MORE
080- 00 00 00 00 00 00 00 00  ........
088- 00 FF 3C 00 33 00 00 64  ..<.3..d
090- 00 00 00 00 00 00 00 21  .......!
098- 00 20 D2 A8 00 00 02 00  . ......
0A0- 27 43 4F 4E 56 45 52 54  'CONVERT
0A8- 00 00 00 00 00 00 00 00  ........
0B0- FF 6F 00 2A 00 01 50 00  .o.*..P.
0B8- 61 A7 00 00 00 00 21 00  a.....!.
0C0- 20 61 A7 00 00 02 00 27   a.....'
0C8- 53 54 41 52 54 55 50 00  STARTUP.
0D0- 00 00 00 00 00 00 00 FC  ........
0D8- 99 00 18 00 C9 2C 00 4F  .....,.O
0E0- A7 00 00 00 00 21 01 08  .....!..
0E8- 4F A7 00 00 02 00 25 4D  O.....%M
0F0- 4F 49 52 45 00 00 00 00  OIRE....
0F8- 00 00 00 00 00 00 FC B1  ........
                    MORE

COMMAND:
ARROWS - MOVE BYTE   R - READ   W - WRITE
A,H,D - INPUT MODE   : - CHANGE   S - S/D
```

Figure I.



deleted or overwritten file and files from a disc containing bad blocks, and preparing dual format ProDOS/DOS 3.3 discs, as well as simply examining or altering files on disc.

Zap can also be used to examine and modify DOS 3.3 discs, since data is stored on them in exactly the same 16 sector format even though ProDOS reads from and writes to the disc in two sector chunks called blocks.

The simplest potential disaster from which you can easily recover with Zap is the accidentally deleted file. First it is necessary to rewrite the storage type/filename length byte.

If the file is the last one in the directory you also have to increase by one the number of undeleted entries in the directory header (bytes $21.22), as ProDOS will only countenance a search through the directory for this number of files.

If it is a seedling file it can then be read and copied to a different disc – never try and write back to a disc after you have tampered with the directory header.

Be sure to tidy the directory by writing a zero back into the first byte of the file entry, and correcting the number of entries byte in the header if necessary.

If it is a sapling or tree file life is a little more complicated because, unfortunately, ProDOS clears out the index block on deletion. You therefore have to track down the blocks that belong to your deleted file.

These may well be immediately after the empty index block, but otherwise you may need to search elsewhere. A good guide is the free blocks marked in the volume bit map, released when the file was reduced in size, and the ProDOS habit of always allocating blocks in strict sequence helps you to keep the correct order.

The Ascii listing is often valuable to confirm that you have tracked down the right blocks by reading text file contents, or variable names, strings and REMs in a Basic program (binary files will be tricky).

Having found the missing blocks you must remake the index block, which will only contain an entry for the first block, the one that would represent a seedling file.

If you want to recover the original file permanently two further steps are necessary. You must increment the directory header entry for the number of undeleted files if you have not already done so, and – more difficult – you must work out which bits in the volume bit map to set to zero in order to flag the blocks as used, not forgetting the index block itself.

Once a block has been overwritten the previous contents are lost, but if a short file is written over a long file the bulk of the original file will still be recoverable, though never the first block.

This situation can occur if, for instance, you save a file from within an applications program when you meant to load it, so that an empty file overwrites the original, or if you save a Basic program after a NEW command.

As with undeleting a file you first have to track down the lost blocks, following the procedure described above.

For text files and binary files you can now correct the index block as before – or make a fresh one if necessary – leaving out the overwritten block or blocks except for random access text files, where an omitted block could mess up the record count.

Don't forget that occasionally there will be high byte values for the block pointers in the second half of the index block.

Next you must correct the file entry in the directory, or make a new one if your file was overwritten by a different file. The storage type may need changing from 1 (seedling file) to 2 (sapling file).

The total number of blocks must be corrected – don't forget to include the index block – and the ENDFILE.

You can work out the ENDFILE value exactly, or you may get away with calling it 512 bytes for each block. Remember to leave out the index block this time.

If constructing a new file entry you need to put in a filename, file status and pointer to the key block of the directory. Finally, you have to change the key block pointer to your reconstructed index block.

For Basic programs there is a complicating factor, because programs are stored with each line containing, at the start, a pointer to the next line.

The best bet here is to proceed as above, but leave in the overwritten block or blocks, in other words include those block(s) in your reconstructed index block.

When you have patched the directory file entry you will find, if you load the program, immediately that it still contains only the short new program, if any. You must remake the link from the first overwritten block.

To remake the link, display the first recovered block and read the bytes from the beginning until you find the first null or zero byte. Immediately following the null byte will be a two byte pointer, low byte first as always.

If your original program was loaded in the usual place, the address in the pointer ought to be $Ann if one block was overwritten, $Cnn if two were lost, and so on. This address should be written, low byte first, into the second and third bytes of the first overwritten block to complete the patching process.

If you get an I/O ERROR when reading a file – and you haven't already been tampering with it with Zap – but other files on the disc are all right, the chances are that the file includes one or more faulty blocks. You can track these down by reading through the file block by block with Zap until it fails with ProDOS error number 39.

As with the case of an overwritten file the strategy to use is different for sequential textfiles, binary files or Basic programs on the one hand, and random access text files on the other.

With sequential text files and binary files the best strategy is to leave the bad blocks out of the list in the index blocks. Simply rewrite the index block leaving out the bad block numbers and moving up the remainder. Finally decrease the directory entries for the total number of blocks and ENDFILE – high byte only, decreasing by two for every bad block.

For random access files the process is simplest of all. Simply replace the pointers to the bad blocks by zeros, and decrease the total block value but not ENDFILE. ProDOS will treat it as a sparse file, and all will be well.

Basic programs should be treated in the same way as random access text files, but again the pointers must be

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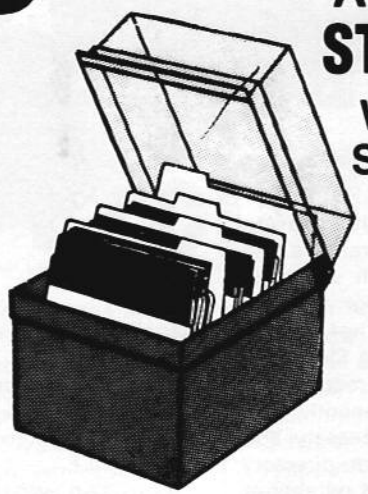

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patched back together. Start, as before, by finding the first pointer in the block after the gap and note it.

This time, however, it should be written as near as possible to the end of the last block before the gap. Search back from the end of the block for the null byte that marks the end of a line of Basic, but note that the pointer to the next line number can also contain zeros so search back another four bytes and take the first zero you find if there is one.

Overwrite the pointer following the null byte with the one you have noted from the later block, and this will bridge the gap.

If the bad block occurs in the key index block you have to start recovering overwritten files by tracking down the blocks making up the file.

If you are lucky there will be one before and the rest after the bad block, but this time there will be no gaps in the volume bit map to help your search.

Once you have found the block numbers you must construct a new index block in an empty block, then alter the block pointer in the directory to point to this new index block, and mark the block as used in the volume bit map if you intend to continue using the disc.

Note that no other changes are necessary to the volume bit map. If you continue to use the disc, the bad blocks will remain flagged as in use and will not be used again.

If a bad block occurs in a directory or subdirectory block you are in much more serious trouble. The files whose details are stored in that and any subsequent directory blocks will be unobtainable. If the bad block is in the key directory block the whole disc is unavailable.

Should it be imperative for you to recover as much information as possible from the disc the first step is to transfer all recoverable blocks on to a fresh, blank disc. Program ZAP can be used to copy uncorrupted blocks from one disc to another formatted one.

The next stage is to recover those files in the directory blocks that are undamaged, but come after the damaged block. Recovery can be done, on the copy disc, by using Zap to copy the same block number from another disc which must have all the directory entries on that block full.

ProDOS will then be fooled into thinking that the directory is OK, and will allow you to get at the files in the sound directory blocks beyond the fault in order to copy them on to another disc – don't attempt to use the disc generated this way permanently.

If the bad block is the key directory block, transferring another key directory block should still work provided you alter the item in the directory header entry for the number of undeleted files in the directory to be at least as large as the number of files originally on the disc – setting it to 51 ($33) would be safest.

Recovering the files in the missing directory block will be really hard work. Having made copies of the files in the sound directory blocks you can delete them to free the block numbers they occupied in the volume bit map.

You then have to search all the remaining blocks and try and find the index blocks of the lost files – there won't be any index blocks for seedling files, but these are unlikely to be worth the effort of recovering anyway.

Then you must reconstruct directory entries for each file, setting the block pointer to the index block you have found. It would be esiest to patch the entries in the directory block you copied from elsewhere. Other items that would in general need altering would be the file type, blocks occupied, ENDFILE and SUBTYPE.

It is possible to prepare a disc that can be used both with ProDOS and DOS 3.3 – not in the sense of being able to access the same file with either system which is impossible since files are stored in a different format by the two systems, but in the sense of a disc on which you can store or access files with either system.

The key to the possibility of a dual disc lies in the fact that both systems use sixteen sectors per track, and that the key directory sections of the two systems are stored on different tracks.

The directory blocks of ProDOS, along with other crucial blocks, are $00 to $06 on track $00. DOS 3.3 stores its directory information on track $11, – blocks $88 to $8F.

In order to prepare a dual disc, format a new ProDOS disc that is to become the dual disc, and initialise a new DOS 3.3 disc. Delete the Hello program from the DOS 3.3, and then use Zap to copy blocks $88 to $8F on to the ProDOS.

You now have a disc usable with either system, but since each is unaware of the other's presence, they may overwrite each other. To prevent this the DOS 3.3 tracks must be marked as used in the ProDOS volume bit map, and similarly the ProDOS blocks must be marked in the DOS 3.3 equivalent, the volume table of contents (VTOC).

To protect the DOS 3.3 tracks, which for simplicity could be chosen as $11 to $22, use the program Zap to read in block 6 the volume bit map. For a newly formatted disc the bit map should contain a 1 in byte zero, then 34 $FFs.

Each byte corresponds to a track, so change bytes $11 onwards to zeros, and write the block back to the disc. To check that you have been successful CATalog the disc, which should report:

BLOCKS FREE: 129
BLOCKS USED: 151

You could also use Zap to alter the DOS 3.3 VTOC on block $88, but there is an easier way. DOS 3.3 reads the VTOC into memory, so from DOS 3.3. the following program will mark the ProDOS sectors – tracks $0 to $10 – as used.

```
10 BA=46071: REM BASE
   ADDRESS
20 CALL BA-1024: REM READ
   VTOC INTO BUFFER
30 FOR J=0 TO 64 STEP 4
40 POKE BA+J,0: POKE
   BA+J+1,0
50 NEXT J
60 CALL BA-1020: REM WRITE
   VTOC BACK TO DISK
```

The disc can now be used to store and retrieve files under either system with complete safety, but keep the original disc that you have prepared as a master dual format disc and make copies to use.

Note that the disc will not boot DOS 3.3. It can of course be made to boot ProDOS by loading the files PRODOS and BASIC.SYSTEM.

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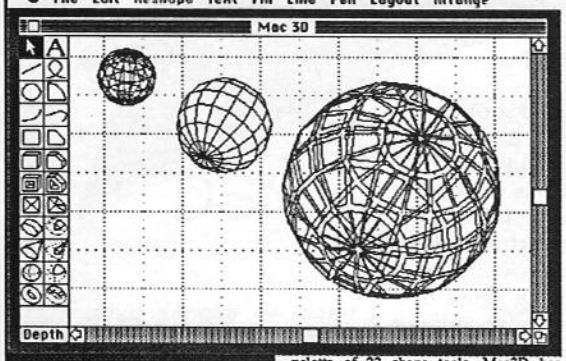

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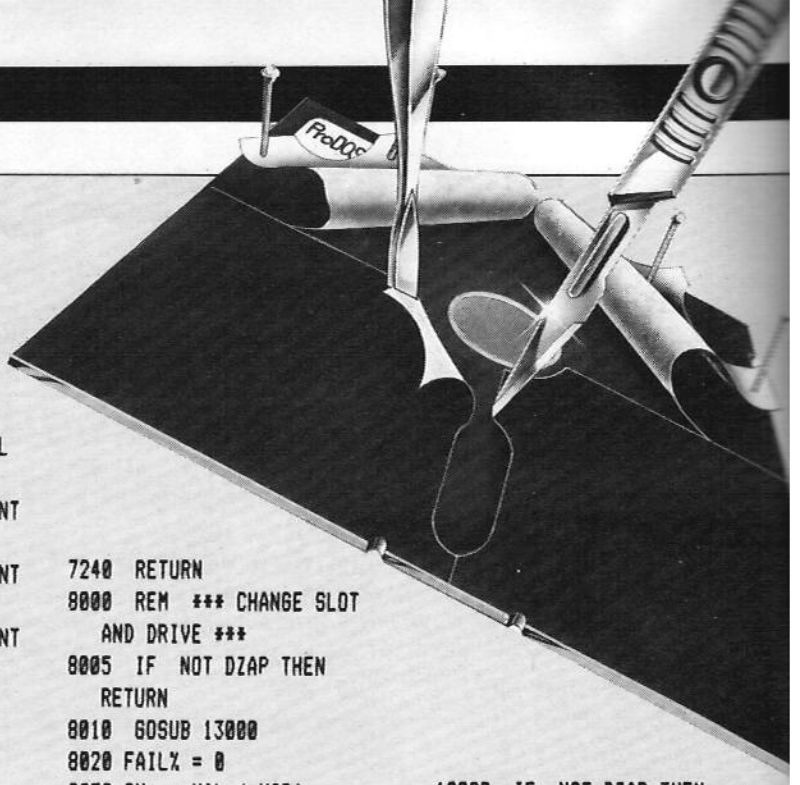
```
10 BL$ =  CHR$ (7):D$ =
   CHR$ (4)
20  DIM KEY$(12),BT$(40)
30  DATA
   8,21,11,10,82,87,72,68,65,
   58,83,27
40  REM
   L-A,R-A,UP-A,DN-A,R,W,H,D,
   A,:,S,ESC
50  FOR J = 1 TO 12
60  READ X
70 KEY$(J) =  CHR$ (X)
80  NEXT J
90  POKE 758,164: POKE
   759,36: POKE 760,177:
   POKE 761,40: POKE
   762,141: POKE 763,254
100  POKE 764,2: POKE
   765,96: REM  FORWARD
   ARROW HANDLER
110  POKE 768,169: POKE
   770,32: POKE 771,218:
   POKE 772,253: POKE 773,96
120  REM  SUBROUTINE PRBYTE
130  POKE 774,32: POKE
   775,179: POKE 776,253:
   POKE 777,96
140  REM  SUBROUTINE PRINT
   BLOCK
150  POKE 778,32: POKE
   779,0: POKE 780,191: POKE
   784,141: POKE 785,255:
   POKE 786,2: POKE 787,96
160  REM  MLI CALL
170  FOR J = 0 TO 61
180  READ X
190  POKE 800 + J,X
200  NEXT J
210  DATA
   169,3,133,37,32,34,252,165
   ,40,24
220  DATA
   105,31,133,40,160,0,165,23
   6,209,238
230  DATA
   144,16,177,238,197,235,144
   ,10,9,128
240  DATA
   201,224,144,2,37,237,208,2
   ,169,174
250  DATA
   145,40,200,192,8,144,225,1
   65,238,105
260  DATA
   7,133,238,230,37,165,37,20
   1,19,144
270  DATA  199,96
280 ST = 778:PL = 788
290  POKE 782,PL -  INT (PL
   / 256) * 256: POKE 783,
   INT (PL / 256)
300  POKE PL,3: POKE PL +
   2,0: POKE PL + 3,64: REM
   PART OF PARAMETER LIST,
   BUFFER = $4000
310 X = 0:Y = 0:PAGE = 0
320 BA = 16384
330 DZAP = 1:UC = 0:LL =
   0:UL = 0
340  HOME
350  VTAB 4
360  PRINT "OPTION LIST"
370  VTAB 7
380 OP = 1: GOSUB 14000
390  PRINT "1) DZAP"
400 OP = 2: GOSUB 14000
410  PRINT "2) MZAP"
420  VTAB 11
430 OP = 3: GOSUB 14000
440  PRINT "3) ALL
   CHARACTERS"
450 OP = 4: GOSUB 14000
460  PRINT "4) UPPER CASE
   ONLY"
470  VTAB 15
480 OP = 5: GOSUB 14000
490  PRINT "5) HIGH BIT
   CLEAR"
500 OP = 6: GOSUB 14000
510  PRINT "6) HIGH BIT SET"
520 OP = 7: GOSUB 14000
530  PRINT "7) EITHER"
540  NORMAL
550  VTAB 21
560  PRINT "TYPE THE NUMBER
   TO CHANGE AN OPTION"
570  PRINT "OR <RETURN> TO
   ACCEPT"
580  GET A$
590  IF A$ =  CHR$ (13) THEN
   GOTO 670
600 OP =  VAL (A$): IF OP <
   1 OR OP > 7 THEN  PRINT
   BL$;: GOTO 550
610  IF OP < 3 THEN DZAP = 2
   - OP
620  IF OP > 2 AND OP < 5
   THEN UC = OP - 3
630  IF OP = 5 THEN LL =
   0:UL = 0
640  IF OP = 6 THEN LL =
   1:UL = 1
650  IF OP = 7 THEN LL =
   0:UL = 1
660  GOTO 340
670  HOME
680  IF DZAP THEN SN = 6:DN
   = 1: GOSUB 8060:BLK = 2:
   GOSUB 4040
685  IF  NOT DZAP THEN BLK =
   PEEK (104): GOSUB 4040
690 MD% = 1: GOSUB 6020
700  VTAB 23: HTAB 1
710  PRINT "ARROWS - MOVE
   BYTE  R - READ";
720  IF DZAP THEN  PRINT "
   W - WRITE";
730  PRINT : PRINT "A,H,D -
   INPUT MODE  : - CHANGE";
740  IF DZAP THEN  PRINT "
   S - S/D";
1000  REM  *** HANDLE KEYS
   ***
1010  VTAB 22: HTAB 1
1020  PRINT "COMMAND: ";
1030  VTAB 22: HTAB 10: CALL
   - 868
1040  GET KEY$
1050 KEY = 0
1060  FOR J = 1 TO 12
1070  IF KEY$ = KEY$(J) THEN
   KEY = J:J = 12
1080  NEXT J
1090  IF  NOT KEY THEN
   PRINT BL$;: GOTO 1030
1100  PRINT KEY$;
1110  ON KEY GOSUB
   2000,2000,3000,3000,4000,5
   000,6000,6000,6000,7000,80
   00,30000
1120  GOTO 1000
2000  REM  *** L/R ARROW
   KEYS ***
2010  GOSUB 9000
2030  IF  PEEK (49249) > 127
   OR  PEEK (49250) > 127
   THEN X = 7 * KEY - 7:
   GOTO 2050
2040 X = X + 2 * KEY - 3
2050  IF X > 7 THEN X = X -
   8:KEY = 4: GOTO 3050
2060  IF X < 0 THEN X = X +
   8:KEY = 3: GOTO 3050
2070  INVERSE : GOSUB 9000:
   NORMAL
2080  RETURN
3000  REM  *** DN/UP ARROW
   KEYS ***
3010  IF  PEEK (49249) > 127
   OR  PEEK (49250) > 127
   THEN  GOTO 3500
3020  GOSUB 9000
3050 Y = Y + 2 * KEY - 7
3060  IF Y < 0 OR Y > 15
   THEN Y = Y - 16 * (2 *
   KEY - 7): GOTO 3500
3070  INVERSE : GOSUB 9000:
   NORMAL
3080  RETURN
3500  REM  *** CHANGE PAGE
   ***
3510 PAGE = PAGE + 2 * KEY -
   7
3520  IF  NOT DZAP THEN
   GOTO 3550
3530  IF (BLK = 279 AND PAGE
   > 3) OR (BLK = 0 AND PAGE
   < 0) THEN PAGE = PAGE - 2
   * KEY + 7: PRINT BL$;:
   RETURN
3540  IF PAGE < 0 OR PAGE >
   3 THEN BLK = BLK +  SGN
   (PAGE): GOTO 4035
3550  IF  NOT DZAP AND (BA +
   128 * PAGE) > 65535 OR
   (BA + 128 * PAGE) < 0
   THEN PAGE = PAGE - 512 *
   SGN (PAGE)
3560  GOSUB 10000
3570  RETURN
4000  REM  *** READ NEW
   BLOCK ***
4005  IF MD% > 2 THEN  GOTO
   5500
4010  GOSUB 13000
4020  GOSUB 11000
4025  IF FAIL% THEN  RETURN
4030 BLK = NUM
4035  IF BLK < 0 OR BLK >
   279 OR (BLK > 255 AND
   NOT DZAP) THEN  PRINT
   BL$;: RETURN
4040  IF  NOT DZAP THEN BA =
   256 * BLK: GOTO 4110
4050  POKE PL + 4,BLK -  INT
   (BLK / 256) * 256
4060  POKE PL + 5, INT (BLK
   / 256)
4070  POKE ST + 3,128
4080  CALL ST
4090  IF  PEEK (767) > 0
   THEN  GOTO 20000
4100  IF PAGE < 0 OR PAGE >
   3 THEN PAGE = PAGE -  SGN
```



```
   (PAGE) * 4: GOTO 4120
4110 X = 0:Y = 0:PAGE = 0
4120  GOSUB 10000
4130  RETURN
4500  REM  *** PRINT BLOCK
   NO ***
4510 HB =  INT (BLK / 256)
4520 BT = BLK - 256 * HB
4530  INVERSE
4540  PRINT HB;
4550  GOSUB 12000
4560  NORMAL
4570  RETURN
5000  REM  *** WRITE NEW
   BLOCK ***
5002  IF  NOT DZAP THEN
   RETURN
5005  IF MD% > 2 THEN  GOTO
   5500
5010  GOSUB 13000
5020  GOSUB 11000
5025  IF FAIL% THEN  RETURN
5030 BLK = NUM
5040  VTAB 22: HTAB 18
5050  INVERSE : PRINT
   BL$;"ARE YOU SURE (Y/N)?
   ";
5060  NORMAL : GET YN$
5070  IF YN$ <  > "Y" AND
   YN$ <  > "N" THEN  PRINT
   BL$;: GOTO 5040
5080  IF YN$ = "N" THEN
   RETURN
5090  PRINT YN$;
5100  POKE PL + 4,BLK -  INT
   (BLK / 256) * 256
5110  POKE PL + 5, INT (BLK
   / 256)
5120  POKE ST + 3,129
5130  CALL ST
5140  IF  PEEK (767) > 0
   THEN  GOTO 20000
5150  VTAB 1: HTAB 8
5160  GOSUB 4500
5170  RETURN
5500  REM  *** WRONG MODE
   ***
5510  VTAB 22: HTAB 18:
   INVERSE : PRINT
   BL$;"WRONG MODE";: NORMAL

5520  FOR J = 1 TO 1000:
   NEXT J:J =  PEEK (49168)
5530  VTAB 22: HTAB 10: GET
   KEY$
5540  CALL  - 868: POP :
   GOTO 1050: REM  HANDLE
   NEXT KEY
6000  REM  *** SET INPUT
   MODE ***
6010 MD% = KEY - 6
6020  VTAB 1: HTAB 35: CALL
   - 868: INVERSE
6030  IF MD% = 1 THEN  PRINT
   "HEX";
6040  IF MD% = 2 THEN  PRINT
   "DEC";
6050  IF MD% = 3 THEN  PRINT
   "ASCII";
6060  NORMAL
6070  RETURN
7000  REM  *** INPUT DATA
   ***
7010  GOSUB 13000
7020 CH = 0:BT$ = ""
7030  FOR J = 1 TO  LEN
   (IP$)
7040 CH$ =  MID$ (IP$,J,1)
7050  IF CH$ <  > " " AND
   CH$ <  > "," THEN BT$ =
   BT$ + CH$: IF MD% < 3
   THEN  GOTO 7070
7060  IF BT$ > "" THEN CH =
   CH + 1:BT$(CH) = BT$:BT$
   = ""
7070  NEXT J
7080  IF BT$ > "" THEN CH =
   CH + 1:BT$(CH) = BT$
7090  FOR J = 1 TO CH
7100  IF MD% = 3 THEN BT =
   ASC (BT$(J))
7110  IF MD% = 2 THEN BT =
   VAL (BT$(J))
7120  IF MD% = 1 THEN ST$ =
   BT$(J): GOSUB 11100:BT =
   NUM
7130  POKE (BA + 128 * PAGE
   + X + 8 * Y),BT
7140  GOSUB 9000
7150 BT$ =  CHR$ (46): REM
   DOT
7160  IF BT < 32 OR BT > 127
   THEN  GOTO 7190
7170  IF UC AND BT > 95 THEN
   BT = BT - 32
7180 BT$ =  CHR$ (BT)
7190  HTAB 32 + X: PRINT
   BT$;
7200 FAIL% = 0
7210 KEY = 2: GOSUB 2000
7220  IF FAIL% THEN J = CH
7230  NEXT J
7240  RETURN
8000  REM  *** CHANGE SLOT
   AND DRIVE ***
8005  IF  NOT DZAP THEN
   RETURN
8010  GOSUB 13000
8020 FAIL% = 0
8030 SN =  VAL ( MID$
   (IP$,1,1))
8040 DN =  VAL ( MID$
   (IP$,3,1))
8050  IF SN < 1 OR SN > 7 OR
   DN < 1 OR DN > 2 THEN
   PRINT BL$;: RETURN
8060  VTAB 1: HTAB 20
8070  PRINT "S#";: INVERSE :
   PRINT SN;: NORMAL
8080  PRINT " D#";: INVERSE
   : PRINT DN;: NORMAL
8090 BT = (DN - 1) * 128 +
   SN * 16
8100  POKE PL + 1,BT
8110  RETURN
9000  REM  *** REWRITE
   SCREEN BYTE ***
9010 BT =  PEEK (BA + 128 *
   PAGE + X + 8 * Y)
9020  VTAB Y + 4: HTAB 3 * X
   + 7
9030  GOSUB 12000
9040  RETURN
10000  REM  *** PRINT MAIN
   DISPLAY ***
10010  VTAB 3: HTAB 1
10020 HI = BA / 256 +  INT
   (PAGE / 2)
10030 LO = BA + PAGE * 128 -
   256 * HI
10040  POKE 60,LO: POKE
   61,HI
10050 LO = LO + 127
10060  IF LO > 255 THEN LO =
   LO - 256:HI = HI + 1
10070  POKE 62,LO: POKE
   63,HI
10080  CALL 774: REM  PRINT
   1/4 BLOCK IN HEX
10090  IF  NOT DZAP THEN
   GOTO 10140
10100  FOR J = 4 TO 19
10110  VTAB J: HTAB 1: PRINT
   " ";
10120  NEXT J
10130  REM  BLANK OUT FIRST
   DIGIT
10140  POKE 238,128 * (PAGE
   - 2 *  INT (PAGE / 2))
10150  POKE 239, INT (BA /
   256 + PAGE / 2)
10160  POKE 235,32 + 128 *
   LL: REM  LOWER LIMIT OF
   PRINTING CODES
10170  POKE 236,127 + 128 *
   UL: REM  UPPER LIMIT OF
   PRINTING CODES
10180  POKE 237,255 - 32 *
   UC
10190  CALL 800
10260  VTAB 3: HTAB 1: CALL
   - 868: IF PAGE > 0 OR
   NOT DZAP THEN  HTAB 19:
   INVERSE : PRINT "MORE";:
   NORMAL
10270  VTAB 20: HTAB 1: CALL
   - 868: IF PAGE < 3 OR
   NOT DZAP THEN  HTAB 19:
   INVERSE : PRINT "MORE";:
   NORMAL
10280  VTAB 1: HTAB 1: IF
   DZAP THEN  PRINT "BLOCK:
   ";: GOSUB 4500
10290  INVERSE : GOSUB 9000:
   NORMAL
10300  RETURN
11000  REM  *** EVALUATE DEC
   OR HEX ***
11010 ST$ = "":FAIL% = 0
```

```
11020  IF MD% = 1 THEN  GOTO
   11060
11030 NUM =  VAL (IP$)
11040  IF  STR$ (NUM) <  >
   IP$ THEN  PRINT
   BL$;:FAIL% = 1
11050  RETURN
11060  FOR JJ = 1 TO  LEN
   (IP$)
11070 MD$ =  MID$ (IP$,JJ,1)
11080  IF MD$ <  > " " THEN
   ST$ = ST$ + MD$
11090  NEXT JJ
11100 NUM = 0
11110  FOR JJ = 1 TO  LEN
   (ST$)
11120 MD$ =  MID$ (ST$,JJ,1)
11130  IF MD$ >  = "0" AND
   MD$ <  = "9" THEN MD =
   VAL (MD$): GOTO 11160
11140  IF MD$ < "A" OR MD$ >
   "F" THEN FAIL% = 1: PRINT
   BL$;:JJ =  LEN (ST$):
   GOTO 11170
11150 MD =  ASC (MD$) - 55
11160 NUM = 16 * NUM + MD
11170  NEXT JJ
11180  RETURN
12000  REM  *** PRINT BYTE
   IN HEX ***
12010  POKE 769,BT
12020  CALL 768
12030  RETURN
13000  REM  *** INPUT A
   STRING ***
13010 IP$ = "":K = 0
13020  GOSUB 13500
13030 K = K + 1: IF K > 38
   AND CH$ <  > CHR$ (13)
   THEN  PRINT BL$;: GOTO
   13020
13040  IF CH$ <  > CHR$
   (13) THEN IP$ = IP$ +
   CH$: PRINT CH$;: GOTO
   13020
13050  RETURN
13500  REM  *** INPUT A
   CHARACTER ***
13510  GET CH$
13520  IF CH$ =  CHR$ (8)
   AND  LEN (IP$) > 1 THEN
   IP$ =  LEFT$ (IP$, LEN
   (IP$) - 1): PRINT CH$;:
   GOTO 13510
13530  IF CH$ =  CHR$ (8)
   AND  LEN (IP$) = 1 THEN
   IP$ = "": PRINT CH$;:
   GOTO 13510
13540  IF CH$ =  CHR$ (8)
   THEN  POP : POP : RETURN
13550  IF CH$ =  CHR$ (21)
   THEN  CALL 758:CH$ =
   CHR$ ( PEEK (766) - 128):
   REM  HANDLE FORWARD ARROW
13560  RETURN
14000  REM  *** SET
   HIGHLIGHTS ***
14010  NORMAL
14020  IF DZAP = 2 - OP THEN
   INVERSE
14030  IF UC = OP - 3 THEN
   INVERSE
14040  IF OP = 5 AND LL = 0
   AND UL = 0 THEN  INVERSE
14050  IF OP = 6 AND LL = 1
   AND UL = 1 THEN  INVERSE
14070  IF OP = 7 AND LL = 0
   AND UL = 1 THEN  INVERSE
14080  RETURN
20000  REM  *** PRODOS ERROR
   ***
20010  HOME
20020  INVERSE
20030  PRINT BL$;"PRODOS
   ERROR NUMBER: "; PEEK
   (767)
20040  NORMAL
30000  CALL  - 958: END
```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Accelerator IIe is compatible with just about anything you may have in your computer. It's transparent to your software and compatible with most standard peripherals. And it works perfectly with memory boards.

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MicroLink
in association with
TELECOM GOLD

No. 9 May 1984

NEWSLETTER

MicroLink slashes the cost of Telemessages

OLD-fashioned telegrams have been projected into the Electronics Age – in the form of Telemessages. The difference is that today you compose the message on your micro, transmit it over a phone line via MicroLink, and it is delivered by the postman the following morning, neatly presented in a distinctive, eye-catching yellow envelope that just demands attention!

The Telemessage service was originally introduced so that people could phone their message to the operator. You can still do this, but it costs £4 for up to 50 words.

Now, using your computer and MicroLink, it only costs £1.45 for up to 350 words! Which is sufficient for an average business letter – and a small price to pay if it means you beat the opposition to clinch that all-important contract.

What's more, for an extra 65p your message can be delivered inside an attractive greetings card.

So if you've almost forgotten your loved one's birthday, or it's too late to buy a card – or you've simply missed the last post – Telemessages can be a real godsend.

To ensure delivery by first post the following morning you have to send your message before 8pm. It is instantly transmitted, exactly in the form you keyed it in, via the MicroLink mainframe in London direct to the postal delivery office nearest the recipient's address.

There it is printed out, put into the special envelope, and passed on to the local postman for delivery.

It's as simple as that!

Until now you could only send electronic mail if your recipient also had a computer. Now you can send a Telemessage to any address in the UK – all 22 million of them. (And there is also a next-day service for any of the 90 million homes in the USA.)

What it costs to send a Telemessage:

	By phone	*By MicroLink*
Up to 50 words	£4.00	£1.45
Up to 100 words	£6.25	
Up to 150 words	£8.50	
Up to 200 words	£10.75	
Up to 250 words	£13.00	
Up to 300 words	£15.25	
Up to 350 words	£17.50	

YOUR chance to join MicroLink – Page 51

Takeover boosts e-mail service

BRITISH Telecom's takeover of Dialcom, the world's largest electronic mail service, has been welcomed by Derek Meakin, head of MicroLink.

"Dialcom has a head start over all the other companies engaged in electronic mail on a global scale and is in the best position to take advantage of the dramatic increase in international messaging that is now under way", he says.

"MicroLink will be able to benefit in many ways from the revitalised Dialcom that will result from BT's involvement.

"We can expect many technical developments that will considerably enhance the service we offer our subscribers".

Dialcom has been sold to BT by ITT, the US conglomerate, which has recently been divesting itself of a number of its subsidiaries.

Last year it had an income of $19 million from its 100,000 mailboxes in the USA and from the fees it charges its licencees, the largest of which is the UK's Telecom Gold, of which MicroLink forms part.

But its growing revenue still wasn't sufficient to stop Dialcom running up heavy losses.

BT is putting in its own management and expects Dialcom to be back in profit by 1988.

In addition to the USA and UK, other countries on the Dialcom network are Australia, Canada, Denmark, West Germany, Hong Kong, Ireland, Israel, Korea, Netherlands, New Zealand, Puerto Rico and Singapore.

Subscribers in all these countries can have instant communication with each other by electronic mail, in addition to other messaging services such as telex and telemessages.

Dutch delight..

DUTCH subscriber J.W. Bangert says MicroLink is the most painless way to communicate with friends and colleagues all over the world – and he should know because he's a dentist.

When he isn't filling or pulling teeth at his surgery in Spanbroek he can often be found at the keyboard of his micro.

"I use the fabulous MicroLink to communicate – that's what computers are made for", he says.

"As a dentist who is interested in computers I find the system is a good way to send letters to the USA and England very quickly.

"It also makes it easier to get answers to my questions about computing – it is sometimes very difficult to get computer information in Holland, as we are not so much into these things as you are in Britain.

"I have a lot of friends in England who I often surprise with a nice card on the Telemessage service and I'm also able to send fast messages to professional magazines and organisations like the Dental Association in America".

Easy entrée to multi-tasking on the Apple II

BILL ALLEN supercharges his system with Snapshot Shuttle and Cirtech Flipper

THE Apple II has been with us now, in one form or another, for about nine years. No one would deny that in its present form it is creaking at the seams a little, mainly because it's based on an outdated microprocessor with limited addressing capability and a very low clock speed by modern standards.

But even when displaced from its leading market position by you-know-who, the Apple has still had the benefit of a huge software base and the almost infinite expandability afforded by those indispensable peripheral slots.

In fact, there are many things for which I use my old Apple II+ that I simply cannot manage with my newer computers. That's why loyalty to old trusty has paid off more than ever over the past few years.

Hardware designers have provided us with a wide range of cards for the Apple's slots, some of the most popular of them for memory expansion.

And since the cost of RAM has begun to fall, competitively priced, large capacity memory cards that significantly enhance the power of the Apple II have become affordable for many of us.

So now all that memory is sitting there waiting to be exploited, what are we going to do with it?

Until recently there were just two options – we could either set up a memory card as a RAM disc for loading and saving program files at high speed, or we could use that extra space to increase the size of application programs like AppleWorks, Visicalc, Flashcalc, and so on.

Now a couple of pioneering manufacturers have come up with another use for our extra RAM capacity, multi-tasking.

Essentially multi-tasking is the ability to keep more than one different program in memory at the same time.

With concurrent multi-tasking systems several programs may appear to be running simultaneously on the same computer, but are actually time-sharing the microprocessor. Thus the price often paid for concurrency can be a considerable loss of processing speed.

A more efficient form of multi-tasking is based on the pop-up principle – the ability to suspend running one application while we use another one. This powerful facility is one of the nicer features of the Apple Mac and all those PC/MS-DOS computers.

However those of us who can't bear to be separated from our Apple II don't have to feel left behind by new developments, Dark Star Systems and – to a more limited extent – Cirtech are offering us multi-tasking power right now.

Dark Star Systems' Shuttle software lets Apple II users keep up to four programs in memory and switch back and forth from one to another at will.

The Shuttle requires an Apple with at least 128k of memory, and I have to admit that I bought a copy for my Snapshot card quite a long time before I could really use it. I managed to get a loan of a Vision 256k memory card, and things started moving.

The people at Dark Star said they'll support any memory card available for the Apple II, and I soon had to put this claim to the test when I found to my horror that the Shuttle wouldn't work with the Vision card.

A quick telephone call to Dark Star and, sure enough, about a week later I received a Vision-compatible Shuttle disc, and I was away.

Then I added Cirtech's incredible Flipper – used as a pair of 400k RAM discs – to my system and found that old trusty really had been given a new lease of life.

The Shuttle partitions available RAM into 64k segments called workspaces, into each of which the user can load a different program.

If a larger – say 128k – program is loaded, the Shuttle will automatically accommodate it by joining two workspaces together.

A program expanded beyond 128k will also be handled by the Shuttle system providing a RAM card, or part of a RAM card, can be allocated for that program's sole use.

At any time – except when disc accesses are taking place – the program we are working on can be interrupted by pressing the Snapshot trigger and another program shuttled into main memory and run.

I should stress that the Shuttle stores the status of the whole workspace at the moment of interruption, so the program it contains can be resumed at any time with absolutely no corruption of its data.

This contrasts with the program management software that comes with Cirtech's Flipper, which allows us to swap quite neatly between different programs, but cannot stop a program in mid-flight and then resume it from the point of interruption as can the Shuttle.

Nor can the Flipper's program manager be used with copy-protected software – an important consideration for people using commercially produced packages.

The beauty of the Shuttle system is that it will work with any program designed to run on an Apple II, whether it is copy-protected or not, and no matter what operating system it uses.

All this talk of using hardware add-ons to switch from one application to another rather begs the question "Can't all that be done using an integrated program like AppleWorks?" The answer is yes – and, sadly, no.

There are some very powerful integrated packages around, but we are basically tied to those features that the program designer thinks we will find useful.

The Shuttle's advantage is that we, the users, are the ones who choose what features to bring together – it's a kind of pick-and-mix approach to integration.

Before the devotees of commercial integrated software packages start complaining that their system is easier to use and more reliable in the long term, certain facts must be considered.

With the Shuttle the user doesn't have to relearn how to drive when he swaps his tried and trusted packages for the super new integrated one. Instead he just carries on using the old packages, but extends their usefulness by linking them together.

In any case, no one will convince me that one of these integrated packages, squeezed into 64k or 128k, can be as powerful as separate application-specific programs linked together by the Shuttle; compromises have to be made.

There's also the cost of effectively throwing away the old packages, and perhaps their data, and buying the new one. The purchase price of your new integrated package alone could easily exceed the cost of fully tooling up with the Shuttle, and the resulting system wouldn't be as adaptable.

Finally, if you are really determined to use your integrated program you can, and the Shuttle can then be used to make it even more powerful by

linking it to yet more packages.

It is only fair to point out that there is more to integration than just swapping from one kind of program to another – data have to be swapped as well.

Many manufacturers of the more popular suites of business packages are fully aware of this, and offer a common format for transporting data from one program to another.

For example, the DIF (Data Interchange Format) is very useful for such packages as Visicalc, Visiterm, and Visiplot. DIF files are recognised by virtually all other spreadsheet, database and business graphics programs as well.

Programs like AppleWorks and the Prodos version of AppleWriter IIe which run under a common operating system are also able to interchange standard text files.

Data transfer problems do arise if we have a CP/M program – Wordstar, say – running in one workspace, and Visicalc running in another. How do we get that section of the spreadsheet over to our word processor file?

Dark Star has anticipated that question and has a ready answer in the shape of the universal file conversion program (UFC) which they buy in for their customers from the American-based publisher, Quality Software.

So, in our hypothetical example, we would simply print the appropriate section of our Visicalc spreadsheet to disc as a text file, switch to the workspace containing the UFC and convert the Visicalc file to CP/M, and then switch to Wordstar in order to load it into our document.

True, you could do all this without the Shuttle, but you could also go grey doing all the closing down, disc-swapping, re-booting, and searching for the place you left off, many times over, that such a task would normally entail.

There is still room for improvement in the speed department though. The main snag is that disc access is rather slow on the Apple – particularly under DOS 3.3 – and, even with the added versatility of the Shuttle, progress can be a bit like kicking a whale along the beach.

This is where additional memory for use as a RAM disc can be of considerable advantage. The ease with which Cirtech's Flipper or the new Apple II Memory Expansion Card can be configured as a RAM disc makes either one a very natural partner for the Shuttle.

In the case of the Flipper, all it needs is IN#n – where n is the slot number of the card – and we have a pair of 400k RAM discs.

Admittedly, DOS won't recognise drives larger than 400k and we have to put up with 200k of the Flipper that isn't able to be used when we do things this way but, at around £350 for a pair of 400k RAM discs, who's going to complain?

Incidentally, Dark Star's technical wizards now tell me that the latest version of the Shuttle lets me have my cake and eat it too. I can configure it so that my Flipper still has two 400k RAM discs but the remaining 200k gets used for Shuttle workspaces. So old trusty will soon have an empty slot where the Vision-256 used to be.

Let's now look at how the Shuttle is used in practice. It couldn't be simpler – use any slot to install the Snapshot card and boot a backup of the Shuttle disc – the original is not copy-protected, and Dark Star has thoughtfully included a convenient utility for making copies.

The first time we boot the disc – the Shuttle configuration program will run automatically.

It prompts us to enter details of our system, such as the location and size of the installed RAM cards, and what 80 column card is being used. This information is saved to disc, and will be loaded whenever the Shuttle is used in the future.

After configuration we can set about installing all the programs we want to use in the system – see the panel for details of how it's done.

Then we can switch from one to the other whenever we like. When we are running one program the others are left in a state of suspended animation until resuscitated by the Shuttle.

Installing programs in the Shuttle system

WHEN a configured Shuttle disc is booted we are asked to press the Snapshot trigger, and the Shuttle menu appears on screen. Ranged across the top of the screen are numbers from 1 to 4 (A) which represent our available workspaces.

Number 1 is in inverse video to show that it is the currently selected workspace. Below the row of numbers are several menu options that allow us to boot a program disc (B), load a Copykit backup (C), resume running a program (D), or select a few Shuttle housekeeping facilities.

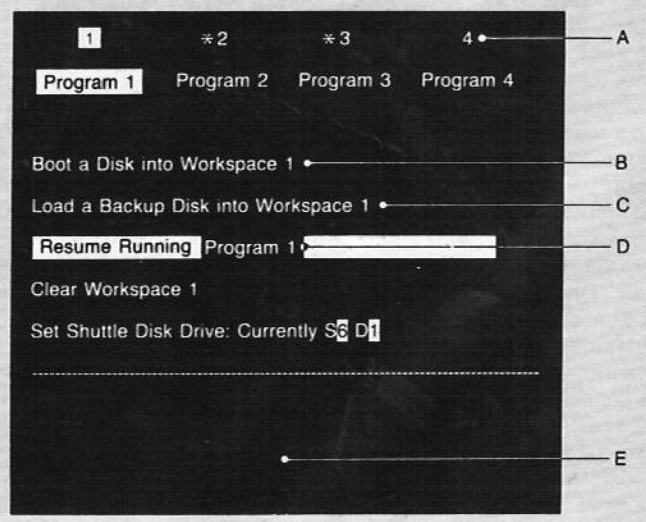
The current option is highlighted by a cursor bar that can be moved up and down the menu with the arrow keys. An option is selected by simply pressing the Return key. Any prompts or instructions associated with a selected menu option appear in an area at the foot of the Shuttle menu reserved for messages (E).

The first thing we do is boot a program disc into Workspace 1 using the Boot a disc option or, if we are working with a Copykit backup, the Load a backup option. On the Apple IIe, we're asked at this stage whether our program uses 64k or 128k – on the II+ we have to tell the Shuttle if the program uses the 80 column screen.

We are also prompted to enter a name for our program, and this appears underneath the workspace number so we can tell at a glance what we have loaded into the system and where it is.

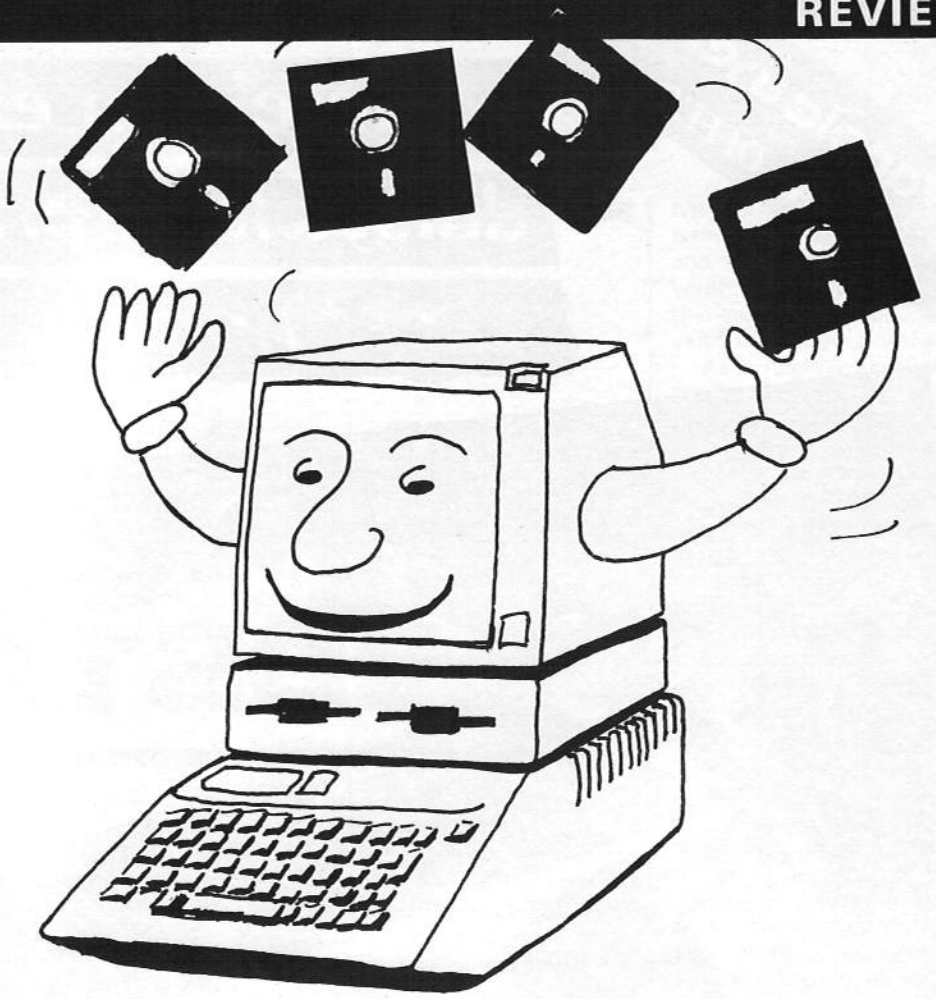
If our program uses 128k its workspace number is marked with an asterisk, so we know how much memory we have left if space is critical.

Once it has all the necessary information the Shuttle will load and run our program in the normal way until we interrupt it by pressing the Snapshot trigger. This returns us to the Shuttle menu.



Now we can either resume running our program from the point of interruption, or boot further program discs into other workspaces. Filling up those available workspaces is achieved quickly and simply by pressing the appropriate number key in order to switch from one to another, and repeating the process described above in each case.

Once we have loaded in all the programs we want to use we can switch from one to another all day long just by pressing the Snapshot trigger, the appropriate workspace number, and the Return key.



I found the system extremely simple to operate, and I've tried out several combinations of programs over a period of several months, more or less determined by what work I was involved with at the time.

One of the first things I tried was to load four different languages for the purposes of benchmarking one against the other – Applesoft was loaded into one workspace, then Pascal, CP/M MBasic, and Aztec C into the other three.

Life can get a bit complicated with discs, but having a couple of 400k RAM discs, courtesy of Flipper, makes things a lot easier.

I must admit it's quite spooky being able to interrupt a C program in the middle of compilation or linking, then swap over to each of the others in turn and finally return to the C program and finish off the compilation without a hitch.

So much for the showing off, but how about a real practical use? Well for business users one combination I tried with the Shuttle might be a winner – I used Omnis 2 as my database, Multiplan as my spreadsheet, Format-80 for word processing, and kept Vicom handy at all times in readiness for communications.

This illustrates what I said earlier about the pick-and-mix approach to integration, and this combination, particularly with the inclusion of comms capability, looks very attractive.

On occasions it can be useful to have the same program loaded into several workspaces and keep a different file open in each. That way, if we're working on a database file, for example, and need some information from a different file, we don't have to close down what we're doing to get access to what we want.

Likewise, the Shuttle is a boon for those of us who suffer the periodic irritation of a colleague who wants to momentarily interrupt our work to send a message via e-mail.

I would imagine that learning a new program with a disc-based tutorial is a lot easier for Shuttle owners. An AppleWorks user could have the program running in one workspace and keep the AppleWorks tutorial on-line in another.

While it is obvious that the Shuttle can play a useful role in the office environment my particular favourite use for the system is in the laboratory.

I seem to spend a lot of my time doing hardware development with my Apple II+ while using my Rovino ICE (in-circuit emulator) card and an eprom emulator and programmer.

One of the snags I used to encounter was the need to have the whole suite of programs for the ICE card on hand, such as the ICE and Debug monitors, the memory test routines, and the disc disassembler.

On top of all that I needed the S-C Macro Assembler to do the basic coding. Since I'm prone to making silly mistakes, I have always longed for some way to avoid the problems associated with my software crashing, or simply hanging up.

Again the Shuttle turns saviour. Not only was I able to keep all my hardware development/debugging software co-resident in memory, but I was able to have two workspaces allocated to the assembler – one spare, in case the other crashed.

The ability to crash one program irretrievably and then just switch in another one is the answer to a developer's prayers.

When trying to sort out problems with floppy disc it's often handy to have several tools at hand, such as a variety of disc copiers, diagnostic programs and general utilities such as those found in the legendary Bag of Tricks suite of programs.

The Shuttle allows just the right mix of tools to be collected together for most work that needs to be done on discs.

It's also great for games – not just for swapping at will between one game and another, but for having a couple of versions of the same game on the go at the same time.

If you make a disastrous mistake with the version in one workspace you can switch to the duplicate in another and avoid the problem the next time. Call it cheating if you like, but all's fair in love and computing!

At the end of the day I have to admit that I'm very impressed with this addition to the Snapshot range of utilities (see *Apple User,* July 1985 for a review of the Printerrupt).

The Shuttle is a well-proven product that is very easy to use, and the range of RAM cards and 80 column cards that Dark Star Systems supports is large, and growing larger all the time.

The Shuttle's menu-driven front-end reduces the learning curve for users to just a few minutes and obviates the need for extensive (and expensive) written documentation.

Of course, there will always be those who feel the only use for this kind of facility is for rapidly hiding the latest adventure game and switching over to the word processor or spreadsheet program just as the boss appears.

But, for serious computer users the Shuttle provides an inexpensive and effective introduction to the joys of multi-tasking.

If you can afford to supplement the Shuttle with a RAM card like the Apple II memory expansion card or Cirtech's Flipper in which it's possible to install both workspaces and RAM discs, then you have a pretty awesome set up.

Snapshot Shuttle £115
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Supplier: *Dark Star Systems, 78 Robin Hood Way, Greenford, Middlesex UB6 7QW. Tel: 01-900 0104.*

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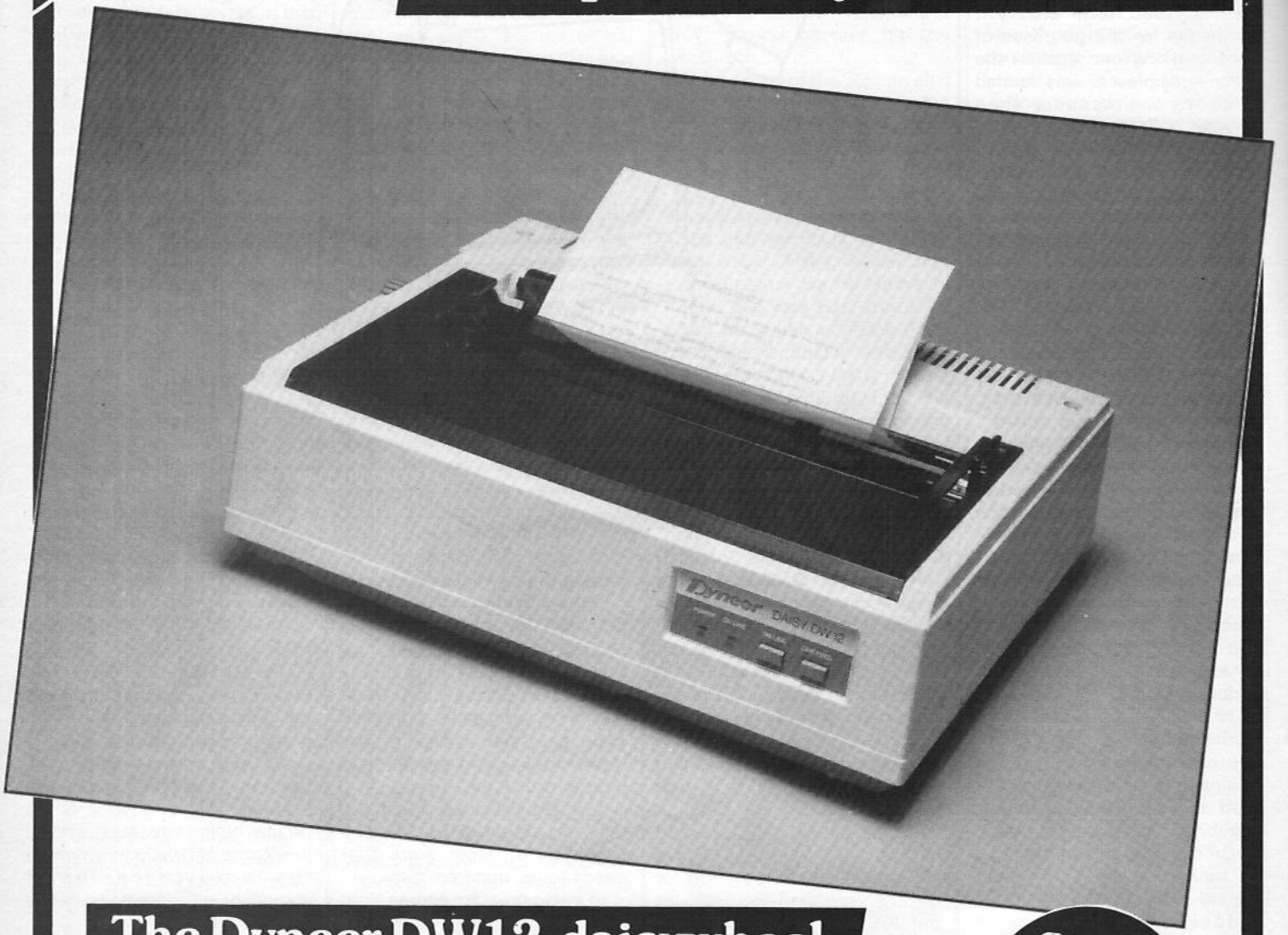

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Jeeves of all trades

GEOFF WOOD samples the Apple II owner's answer to the Macintosh desktop

APPLE II owners may envy Macintosh users because they have desktop accessories such as a note pad, an alarm clock and a calculator instantly to hand.

But now AppleWorks users can have similar facilities with a program called Jeeves, advertised as the affordable personal assistant. The program is written by PBI Software of California and it costs £49.

Jeeves is said to work with some other ProDOS-based programs apart from AppleWorks but it did not work for me with FlashCalc or Apple Writer 2.0.

It does not work at all with older Apple IIes. It needs an Apple IIc or an enhanced Apple IIe with 128k of RAM.

With an enhanced Apple IIe Jeeves also needs a suitable interrupt device such as an AppleMouse IIe, a Thunderclock, a ProClock, a Timemaster II or a PBI interrupt board.

It would not work with my Glanmire GE clock which fits into the games port. Jeeves is claimed to work with RamWorks and MultiRam, both of which provide expanded versions of AppleWorks to take advantage of extra memory.

The Jeeves program not only offers a note pad, alarm clock and calculator but also an appointments calendar and a phone book that dials telephone numbers, assuming you have a modem connected. You can access any of these facilities while using AppleWorks, even in the middle of typing a command.

Jeeves must be loaded before loading AppleWorks. After booting the disc you are asked to enter the time and data – American style with the month before the day.

A menu similar to an AppleWorks menu then appears and the highlighted choice is to load another program with Jeeves standing by. However with an Apple IIe you may first wish to use some of the other menu choices to enter the slot numbers of the printer and/or modem.

To load AppleWorks you replace the Jeeves disc with your AppleWorks start-up disc, type the pathname /APPLEWORKS and press the Return key, then type APLWORKS.SYSTEM and again press Return.

AppleWorks starts up in the normal way, asking you to insert the program disc. If your AppleWorks is already on a hard disc the pathname will be different and you will not need to insert the AppleWorks start-up and program discs.

Unfortunately, there is no provision to pre-set the pathname for AppleWorks. Instead you must type it in manually every time. Because you have already entered the date when booting up Jeeves you do not need to enter the date again when AppleWorks asks you to type today's date.

To save some disc swapping you can create a start-up disc by copying the file JEEVES .SYSTEM from the Jeeves disc to a copy of your AppleWorks start-up disc then adding a file called STARTUP containing a program to load the file JEEVES.SYSTEM on drive 2. You still have to enter the pathname of the AppleWorks start-up disc.

You can then use AppleWorks in the normal way. The main difference is that the date and time appear in the top right hand corner of the screen, although these details can be suppressed if you prefer.

When you want to use Jeeves just press the Open and Closed Apple keys simultaneously and the screen changes to the Jeeves menu offering six choices – calculator, calendar, phone book, note pad, alarm clock and "that's all for now".

The last option takes you back to whatever you were doing in AppleWorks. Alternatively, you can press both Apple keys together to revert to AppleWorks.

When you select the calculator from the Jeeves menu it does not look like the Macintosh version, which simulates a pocket calculator but appears as a two-line window in the top right hand corner of the screen.

You simply type a formula on the top line where the cursor is located, then press = or Return. For example, 45*6/3 yields the answer 90 which then appears in the bottom line.

If you make a mistake while typing a formula you can use the arrow keys to move the cursor and correct the error. If you want to edit the formula after the answer has appeared you can do so and get a new answer.

As in AppleWorks, Open-Apple-E changes an insert cursor into an overwrite cursor or vice versa. Similarly, Open-Apple-B blanks out an entry. Control-Y or Open/Closed-Apple-Y clears from the cursor to the end of the line.

Numbers used in calculations are limited to 10 digits. If you enter a longer number the answer is truncated to 9999999999. Equations are evaluated right to left with no operator preference, so 3+4*5 gives the answer 35. Parentheses can be used to modify the sequence, so 3*(4+5) gives the answer 27.

Up to four levels of parentheses can be used in a formula but the total number of characters is limited to 35. However you can do longer calculations by obtaining a partial answer then typing the remainder of the formula after the answer.

If a formula is typed on the bottom line the answer appears on the bottom line and the formula moves into the top line ready for editing.

When finished with the calculator you can return to the Jeeves menu by pressing Esc. Alternatively you can go straight back to whatever you were doing in AppleWorks by pressing the two Apple keys simultaneously.

With the Macintosh calculator you can cut or copy an answer and paste it into the application program. With Jeeves there is no cut and paste facility so you must remember the answer or write it down if you want to enter it into your AppleWorks file.

Of course, instead of using the Jeeves calculator you could achieve much the same result by entering a formula in a cell in an AppleWorks spreadsheet. Then you could cut and paste the answer into another file without difficulty.

In the calendar mode the whole screen is used to display three panels with the current month in the centre, the

previous month on the left and the next month on the right.

Each panel shows the dates of the days in each week, rather like a wall calendar. Today's date, or the date you referred to last time you used the calendar, is highlighted.

When you press Return you see a list of appointments for the chosen day. However the Jeeves disc must be on-line for the appointments calendar to operate because the lists of appointments are held as a file on the disc.

Alternatively you can keep the file called Appointments on the same disc as your AppleWorks data files, provided that this disc is named Jeeves.

To enter new appointments just type in the time and details. Entries are limited to a maximum of 59 characters for the details of each appointment but a time can be entered more than once. You can change or delete entries if you wish.

Appointments can be entered in any order and Jeeves automatically displays them in correct order with the earliest at the top of the screen and the latest at the bottom.

The screen displays 20 lines, but if that is not enough for one day you can enter more. The manual does not say what the limit is in any one day but I managed to enter 35 lines before it displayed the message "This week's full".

I could not then enter any appointments on other days in that week. There was no difficulty if the number of entries was limited to about five a day, but I could not enter 10 a day for a whole week.

For a busy person who has appointments booked ahead the appointments calendar could be a useful device, though it does little more than can be accomplished with a manual diary.

There is no facility to search for a particular appointment by entering key words and you have to hunt through each day until you find the one you want. With a manual diary you could scan through the pages faster than with Jeeves.

The appointments calendar is held as an Ascii file on the disc so there is a limit to the size of the file depending on the space left on your disc. You can delete the whole file from the Appleworks Other Activities menu so you need to be careful not to accidentally wipe out your whole diary.

You could achieve a similar affect to the Jeeves calendar by creating an AppleWorks database file with categories for the day, time and details.

You could sort this into any order you like and find any record from key words. You would not have the rather neat three month calendar displayed on the screen but wall calendars are not expensive.

When you select the phone book the program accesses a file called Phonebook. To create the phone list just type in the names and phone numbers.

Names are limited to 59 characters and number to 17 characters, including hyphens and parentheses. New entries are automatically displayed in alphabetical order, and you can change or delete entries.

The Jeeves manual does not specify the maximum number of entries the Phonebook file will hold but when I tried to add another entry to a file I had created with 66 names and numbers, the message "The book's full" appeared.

As with the appointments file there is no facility within Jeeves to search for a particular entry. You must scan through the whole file to find the one you want. With only about 60 entries this does not take long.

You could create a similar but much longer phone list with the AppleWorks database and you could then sort it into alphabetical order of name or into numerical order of telephone number. You could also search for any entry by name or number, or even by part of the name or number.

However Jeeves has a big advantage over such a file in that it can automatically dial up any number in its phone book. Not having a modem, I was unable to test this facility.

Jeeves cannot hold both the appointments file and the phonebook file in memory at the same time. When you switch from one accessory to the other it automatically saves one file and loads the other.

The note pad occupies almost half of the screen area and allows you to enter up to 12 lines of information with up to 40 characters on each line. It does not feature word wrap so you must press Return at the end of each line.

You can edit the contents of the note pad by using the arrow keys to move the cursor around, then using the Delete key or Control-Y or Open/Closed-Apple-Y to delete to the end of a line. Open-Apple-B blanks the whole note pad.

If you accidentally clear it you can load back the previous version with Open-Apple-L.

The note pad can be saved with Open-Apple-S but if you forget to issue this command it is automatically saved when you switch to the calendar or phone book. You can print out the contents of the note pad with the command Open-Apple-P.

As with the calendar and phone book, there is no easy way to cut or copy and paste the contents of the notebook into a file.

It can be done by reverting to AppleWorks and creating a new file for the word processor from an Ascii file on disc, using the pathname /Jeeves/Appointments or /Jeeves/Phonebook or /Jeeves/Notepad. You could then cut or copy and paste in the normal way.

The alarm clock has a sub-menu giving four choices. The first option toggles the date/time display on or off. The second toggles the alarm on or off. The third option allows you to set the alarm, and the fourth lets you change the time and date.

If you set the alarm for a time ahead of the current time shown at the top of the screen – and don't forget to turn the alarm on – when the alarm time arrives the Apple bleeps three times and a flashing Apple symbol appears next to the time display. To switch off this flashing Apple you must call up Jeeves, ask for the alarm clock menu and toggle the second option off.

The alarm clock is one of the most useful features of Jeeves but there is one big snag – the clock is not accurate. It does not take the time from your Thunderclock or similar device, instead it works by incrementing a counter for every interrupt cycle from the interrupt device.

However the computer does not permit interrupts to happen while it is accessing the disc, so the clock slows down while the computer is accessing the disc.

The Jeeves manuals claims that with average usage your clock will lose a few minutes during a full day's AppleWorks session. Mine lost 25 minutes within four hours while I was testing out Jeeves on one computer and writing this review on another.

If you use the alarm clock to remind you of an important appointment you should set it for some time before the required time to be on the safe side. Alternatively, you could buy a quartz alarm clock or watch that will not lose or gain more than a second or two in a day.

Jeeves has some good points and some not so good. After reading the advertisements and after experience with a Macintosh I had high hopes, but it did not live up to my expectations. Jeeves is not an essential buy, but it has some useful features.

"Not an essential buy but it has some useful features"

Title: Jeeves
Price: £49
Publisher: PBI Software
Requirements: 128k

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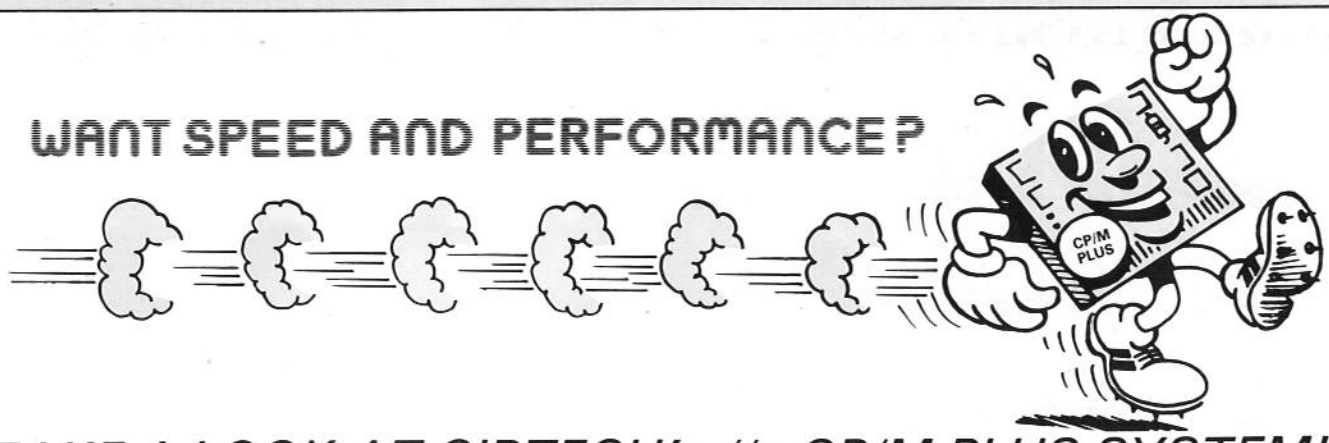

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APPLE IIc plus external drive, monitor, stand and extensive software. £800. Tel: 0787 61335 (Essex).

MACINTOSH (128k) with external drive, MacWrite, MacPaint, MacDraw, £1,000 only. Tel: 0272 734873 (Bristol).

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- Classified ads can only be accepted from private readers, not companies.
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POST TO: Apple Classifieds, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

What it offers the Apple user . . .

Electronic mail is much cheaper than the post

Sending mailbox messages to other subscribers, whose numbers are rapidly growing, is the cheapest form of communication possible. You can send a message of any length to another mailbox for less than the cost of a first-class stamp. And it doesn't cost a penny more to send the same message to 500 different mailboxes! Even a message sent to a mailbox on the other side of the world only costs 30p.

The biggest bulletin board of them all

The number of bulletin boards is growing rapidly. The only snag is that the vast majority are single-user boards – which means lots of other people are also trying to make contact and all too often all you get is the engaged tone. But with the MicroLink bulletin board there is no limit to the number of people using it at the same time. And no limit to the number of categories that can be displayed on the board.

Give your micro mainframe power

With MicroLink your micro becomes a terminal linked directly to the Telecom Gold mainframe computer, and able to tap its tremendous power and versatility. Right away you'll be able to use giant number-crunching programs that can only run on a mainframe.

The mailbox that is always open

MicroLink is in operation 24 hours a day, every day. That means you can access your mailbox whenever you want, and from wherever you are . . . home, office, airport – even a hotel bedroom or golf club! No-one needs to know where you are when you send your message.

We're only a local phone call away

The majority of MicroLink subscribers can connect to our mainframe computer in London by making a local phone call. This is possible because they use British Telecom's PSS system, which has access points all over Britain. A local phone call is all you need, too, for direct access via MicroLink to all the other countries belonging to the international Dialcom system.

Telemessages – at a third off

The modern equivalent of the telegram is the telemessage. Send it before 10pm and delivery is guaranteed by first post the following day (except Sunday). The service was intended for people phoning their message to the operator, which costs £3.50 for 50 words. But you can now use it via MicroLink, for only £1.25 for up to 350 words! For an extra 65p your message can be delivered in an attractive greetings card.

Go teleshopping on your micro

With MicroLink you can study the British Rail timetable – and then buy your ticket in advance. You can book theatre tickets. And even order a bouquet of flowers. It's all part of the tele-shopping revolution!

Send and receive telex messages

With MicroLink you can turn your micro into a telex machine, and can send and receive telex messages of arly length. You will be able to communicate directly to 96,000 telex subscribers in the UK, 1½ million worldwide – and even with ships at sea via the telex satellite network. Business people can now send and receive telexes after office hours, from home or when travelling.

What does it all cost?

Considering all the services you have on tap, MicroLink is remarkably inexpensive. You pay a once-only registration fee of £5, and then a standing charge of just £3 a month. On-line costs are 3.5p a minute (between 7pm and 8am) or 11p a minute during office hours. There is an additional 2.5p a minute PSS charge if you are calling from outside the 01- London call area. Charges for telex, telemessages and storage of files are given on the next page.

How much it costs to use MicroLink

Initial registration fee: £5.

Standing charge: £3 per calendar month or part.

Connect charge: 3.5p per minute or part – cheap rate; 11p per minute or part – standard rate.
Applicable for duration of connection to the Service. Minimum charge: 1 minute.
Cheap rate is from 7pm to 8am, Monday to Friday, all day Saturday and Sunday and public holidays; Standard rate is from 8am to 7pm, Monday to Friday, excluding public holidays.

Filing charge: 20p per unit of 2,048 characters per month.
Applicable for storage of information, such as telex, short codes and mail files. The number of units used is an average calculated by reference to a daily sample.

Information Databases: Various charges.
Any charges that may be applicable are shown to you before you obtain access to the database.

MicroLink PSS service: 2.5p per minute or part (300 baud); 3p per minute or part (1200/75 baud).
Only applies to users outside the 01-London call area.

Telex registration: £10.

Outgoing telex: 5.5p per 100 characters (UK); 11p per 100 (Europe); 18p per 100 (N. America); £1.25 per 400 (Rest of world); £2.75 per 400 (Ships at sea).
Deferred messages sent on the night service are subject to a 10 per cent discount.

Incoming telex: 50p for each correctly addressed telex delivered to your mailbox. Obtaining a mailbox reference from the sender incurs a further charge of 50p.
It is not possible to deliver a telex without a mailbox reference. If a telex is received without a mailbox reference the sender will be advised of non-delivery and asked to provide a mailbox address.
Each user validated for telex and using the facility will incur a charge of 6 storage units a month. Further storage charges could be incurred depending on the amount of telex storage and the use made of short code and message file facilities.

Telemessages: £1.25 for up to 350 words.
Telemessages can be sent with an illustrated greetings card for 65p extra.

Radiopaging: No charge.
If you have a BT Radiopager you can be paged automatically whenever a message is waiting in your mailbox.

International Mail: For the first 2,048 characters – 20p to Germany and Denmark; 30p to USA, Australia, Canada, Singapore, Hong Kong and Israel. For additional 1,024 characters – 10p; 15p.
These charges relate to the transmission of information by the Dialcom service to other Dialcom services outside the UK and the Isle of Man. Multiple copies to addresses on the same system host incur only one transmission charge.

Billing and Payment: All charges quoted are exclusive of VAT. Currently all bills are rendered monthly.

Software over the telephone

MicroLink is setting up a central store of software programs which you'll be able to download directly into your micro. The range will include games, utilities, educational and business programs, and will cover all the most popular makes of micros.

Talk to the world – by satellite

MicroLink is part of the international Dialcom network. In the USA, Australia and a growing number of other countries there are many thousands of users with electronic mailboxes just like yours. You can contact them just as easily as you do users in Britain – the only difference is that the messages from your keyboard go speeding around the world via satellite.

What you need to access MicroLink

You must have three things in order to use MicroLink: a computer (it can be any make of micro, hand-held device or even an electronic typewriter provided it has communications facilities), a modem (it can be a simple Prestel type using 1200/75 baud, or a more sophisticated one operating at 300/300 or 1200/1200 baud), and appropriate communications software.

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(✓) ☐ I also wish to use Telex. I authorise you to charge an additional £10 to my initial bill for validation.

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☑ I confirm that I accept the terms and conditions for the time being in force, a copy of which are available on request.

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Signature _____ Date _____

C. Please invoice the company/authority.

(✓) ☐ If you select this option, which is ONLY AVAILABLE to government establishments and Public Limited Companies, you will be sent an authorisation form for completion which will require an official order number to accept unspecified amounts.

Studying computers in industry

MICROS are being used more and more in schools and institutes of further education to introduce students not only to basic computing, but also to the uses of computers in industry and commerce.

Gateshead Technical College is one example of this approach, where 25 Apple II micros are used in conjunction with other systems, including a mini and mainframe, over a very wide range of courses and subject areas.

Mike Kimber, one of the lecturers in the growing computer studies unit at Gateshead, joined the college in 1976 when microcomputing was in its infancy. Together with Dave Evans, the head of the unit, he has been largely responsible for the Apple installations.

"In 1976 we had no computer section as such, but the engineering department ran a TOPS business computing course using one terminal that was linked to the local education authority's mainframe. By 1977 we had three terminals and one Apple II+.

From there we acquired more Apple systems as and when we were able to justify the expense according to the courses available and the numbers of students registering for them".

In spite of the high demand for full-time and evening courses, Mike and his colleagues have always aimed at a ratio of two students maximum to one machine: "I believe we are well ahead of similar colleges with this ratio", he said.

Mr Kimber initially chose Apple "because it looked robust and had graphics, unlike most machines at that time. I was very interested in computer aided design, as I still am.

"We weren't very sure of our direction in the beginning, so we bought an Apple II+ with a monitor and two disc drives and a Paper Tiger printer. We used the system for the business computing course and were able to give the students the chance to use Basic, which gave them another language.

"We weren't sure how soon computers would appear in commerce or industry, but right from the start we wanted to familiarise students with desktop computing, to give them a training as opposed to an education".

Both he and Mr Evans were impressed with the Apple's performance. "We liked the machine – it was easy to use and was popular with the students", he said.

They gradually introduced it into other courses, such as the ONC business studies when the data processing option appeared. After nine months they bought two more Apple systems to accommodate the increasing demand, and today they have a total of 25 including a IIe and a wide assortment of peripherals among them a graphics tablet, a plotter, language cards, a memory expansion card and a mouse input device for the Apple IIe.

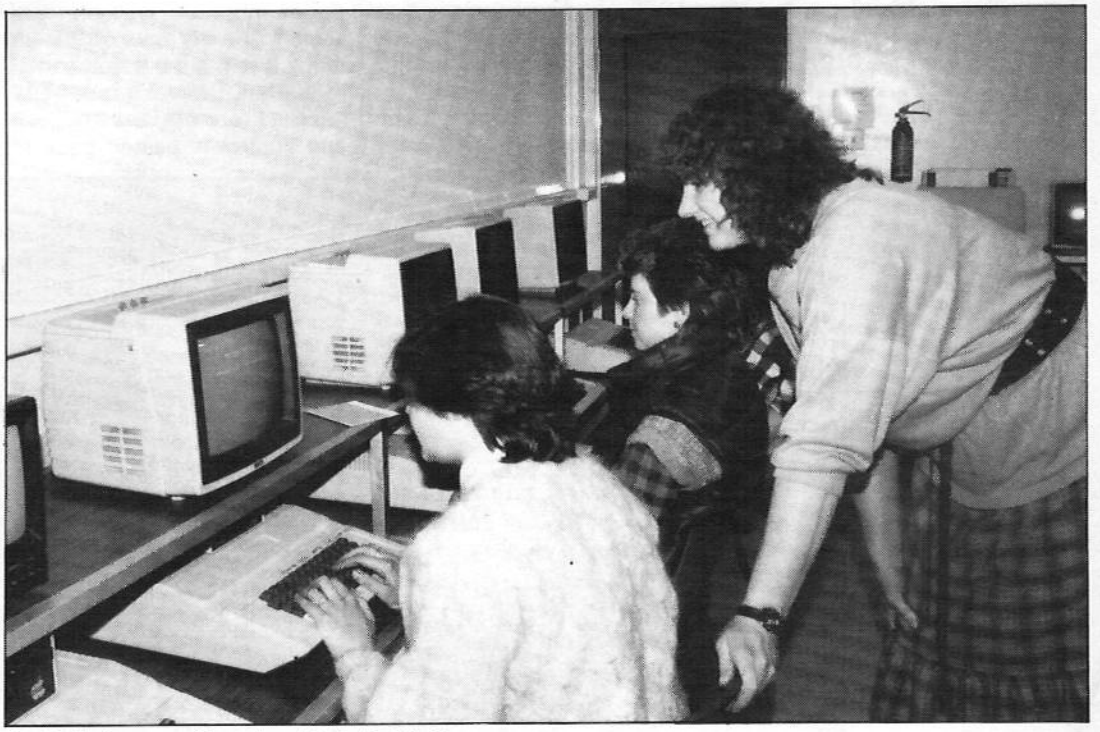
The computer studies unit provide a number of courses for students at different levels – Business/Technician Education Council (BTEC) Higher Diploma in Computer Technology (Computer Assisted Engineering), BTEC Diploma in Computer Studies, Small Business Systems Course for school leavers, full-time YTS and a Business Computing Course sponsored by MSC.

There is a choice of part-time day courses and full and part-time evening courses, and the unit also offers courses for local industry either at the college or on site.

Now with a complement of 15 full-time staff it also services other departments within the college. For instance, Mike is involved in the Diploma for Art and Design.

The unit provides a service to other departments in all aspects of computing except microelectronics and robotics, which are covered by the engineering department.

Most courses specify an application package, and the most widely used are PFS: File (database for information storage and retrieval), ApplePlot (graphical display of data), AppleWriter (word processor), and the Visicalc spreadsheet. Visicalc is used in such different



Apple IIs in use at Gateshead Technical College

areas as art and design and computer assisted engineering.

Some of the students have done projects in industry using Apples – for instance one student used Visicalc in the planning of a power station in Africa, and another used Assembler to achieve automatic data capture and graphical output for compression testing of road surface materials.

Applications packages are also extensively used by heads of department in the college, most of whom use the Apple II for administrative tasks.

Mike Kimber sees the availability of high quality software packages on the Apple II as one of the biggest advantages of the system: "We have swung away from programming in an effort to make students look at computers as tools.

The huge number of good applications packages for the Apple is of great importance, particularly as the Apple is a machine that students are likely to meet in their working lives", he stressed.

The fact that the Apple II is widely used in commerce and industry is seen as another significant factor in the college, where the computer studies unit has strong links with local industries.

"We have to follow what people are using in business – there is no point in showing students things they will never use again. We try to find out what local employers want and then supply it.

"This seems to work very well, and the proof is that our courses continue to be funded, and we have a high success rate in getting placements for students in industry", said Mr Kimber.

In the future he sees Apple systems taking over the top end of the computer courses, to be used for training students who have learnt the basics of computing but want to take it further.

He is impressed with the Apple IIe, and also with the mouse, which is currently being used on a variety of courses with the MousePaint graphics program. "I am interested in exploring different mouse-driven software packages in the future".

He is very positive about the investment made by Gateshead Technical College in Apple equipment. "I prefer Apple II to other systems we have bought or considered buying, and I haven't seen anything so far that makes me regret our original decision to go with Apple.

"The machines are working day and night, they are very robust, and they are allowing us to fulfil our commitment to both computer literacy and applications courses".

In terms of future expansion Mr Kimber feels that the Apple II+ systems will be phased out in favour of the Apple IIe or possibly Apple's Macintosh. Either way it seems as if the college will continue this fruitful partnership for some time to come.

Mary Ainsworth

Modify CATALOG to display free sectors

THIS amendment to DOS will modify the CATALOG command to display the number of free sectors on the chosen disc.

The code amends the volume number title line to include the text '-- FREE=nnn', where nnn is the number of free sectors. It is a quite simple code and lives in two free areas in DOS:

- $ADC3 forces a call to the free sectors code.
- $BCDF is the first part of the free sectors code. It will output -- FREE= and initialise the free sector count to zero. Exit is via a branch to the second part of the free sectors code at $BA69.
- $BA69 is the second part of the free sectors code. It gets each bit map in turn and counts the number of available free sectors. At the end of the bit maps it prints the accumulated total. The DOS routine at $AE2F is called to produce a line feed and control is passed back to the CATALOG command via an RTS.

Once the machine code has been keyed it can be made a permanent part of DOS simply by INITialising a disc.

Lee Hammond

```
ADC3-  20 DF BC   JSR  $BCDF     Call 'Free Sectors' code.
BCDF-  A2 08      LDX  #$08      Length of msg text.
BCE1-  BD 89 BA   LDA  $BA89,X   Get character of msg.
BCE4-  20 ED FD   JSR  $FDED     Output it.
BCE7-  CA         DEX            Point to next character.
BCE8-  10 F7      BPL  $BCE1     Loop until end of msg.
BCEA-  A2 00      LDX  #$00
BCEC-  86 D3      STX  $D3       Save 0 in free
BCEE-  86 D4      STX  $D4       sector count.
BCF0-  A0 C8      LDY  #$C8      Load offset into VTOC
BCF2-  4C 69 BA   JMP  $BA69     Go to part 2 of code.
BA69-  B9 F2 B3   LDA  $B3F2,Y   Get a bit map byte.
BA6C-  F0 0D      BEQ  $BA7B     If 0, No sectors free
BA6E-  0A         ASL            Double
BA6F-  90 FD      BCC  $BA6E     If C=0, try again
BA71-  48         PHA            Save remaining bit map
BA72-  E6 D3      INC  $D3       Incr. low order count byte
BA74-  D0 02      BNE  $BA78     If not 0 branch
BA76-  E6 D4      INC  $D4       Incr. high order count
BA78-  68         PLA            Get back bit map
BA79-  D0 F3      BNE  $BA6E     If not 0, get next free sect.
BA7B-  88         DEY            Decr. index into bit map
BA7C-  D0 EB      BNE  $BA69     If not 0, get next bit map
BA7E-  A6 D3      LDX  $D3       Load low order count byte
BA80-  A5 D4      LDA  $D4       Load high order count byte
BA82-  20 24 ED   JSR  $ED24     Output as decimal
BA85-  20 2F AE   JSR  $AE2F     Output linefeed
BA88-  60         RTS            Return to caller
BA89-  BD C5 C5                  Text of msg.
BA8C-  D2
BA8D-  C6 A0
BA8F-  AD AD A0
```

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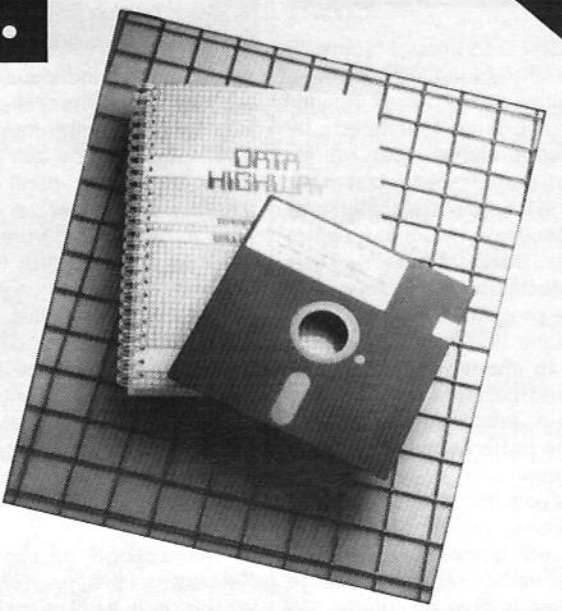

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APPROVED for connection to telecommunication systems specified in the instructions for use subject to the conditions set out in them.

IT'S the fastest growing field in micro-computing. All over the world Apples are talking over the telephone line to other Apples – as well as to the ever-increasing number of public and private databases, bulletin boards and giant mainframe computers.

We want all *Apple User* readers to share in the new technology that makes all this possible. So we're offering a unique, specially designed package to get you started. It features:

- ***The very latest Apple-compatible modem, the Pace Nightingale, allowing a comprehensive variety of baud rates.***
- ***Software on disc. This includes Prestel terminal software specially written to complement the facilities of the Nightingale modem.***

Your *Apple User* package will allow you to talk directly to other computers, to send your own telex messages and telemessages, go tele-shopping – even to download free software programs directly into your Apple.

The Nightingale modem operates at the two most popular baud rates: 1200/75 for Prestel and private and public viewdata systems, and 300/300 for communication with MicroLink and Telecom Gold remote mainframes, mini and micro systems and bulletin boards.

Note: Apple II+ and IIe require interface card

The recommended retail price of the Nightingale modem and Data Highway software is £194 (plus VAT). With this special offer, after adding VAT, you *SAVE OVER £85!* And to help you get started we will give you *FREE* membership to *MicroLink* – giving you instant access to the world of electronic mail, telex and a host of other facilities.

Please send me the Apple User communications package, consisting of a Pace Nightingale modem and Data Highway software on disc, plus FREE membership to MicroLink at the special price of £119 + VAT (Total Price: £136.85).

☐ I enclose a cheque made payable to Database Publications Ltd.

☐ I wish to pay by ☐ Access ☐ Visa

No ..... Expiry date .....

Signed .....

Name .....

Address .....

.....

Send to: Apple User Modem offer, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

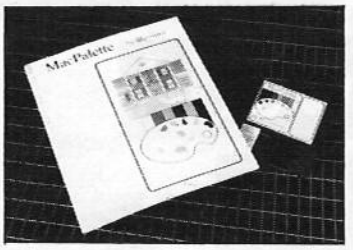
Allow 28 days for delivery.

Macintosh colour

DESIGNED to allow Macintosh to utilise the full colour printing capability of the Apple Imagewriter II printer, MacPalette by Microspot allows colour printing of graphics and text from most existing software including MacDraw, MacDraft, MacProject, Jazz, Microsoft Chart and MacWrite.

The program consists of two parts, the first of which allows users to choose the colours or coloured patterns they wish to print in place of the monochrome patterns or lines used in a document.

It is possible to mix colours in an almost infinite variety of coloured patterns using the seven available colours because the user is able to choose the



colour of each individual pixel in the printed pattern while in a Fat Bits type of environment.

Colours can be assigned to each individual pixel in the existing pattern or an entirely new pattern can be created by redefining the pattern for printing.

Different typestyles of text within drawings or word processed documents may be assigned to print in any one of the seven colours. Where mixed styles of text are used, multicoloured text or word processed documents can be printed.

The second part of MacPalette is the printer driver which is used to print the document directly from within an application.

After the defaults have been set using the MacPalette program, all subsequent colour printing may be done directly from within the user's applications program until such time as the defaults are changed. Price £49.

● *P & P Micro Distributors, Todd Hall Road, Carrs Industrial Estate, Haslingden, Rossendale, Lancs BB4 5HU. Tel: 0706 217744.*

Scanned graphics

NEW technology from Cauzin Systems allows text, graphics and data to be encoded on a strip of paper then entered into an Apple II or Macintosh using a scanning device.

Softstrip data strips can contain anything that can be put on magnetic discs and a single strip can hold up to 5,500 bytes of encoded data.

The Cauzin Softstrip System Reader is plugged into the serial or cassette port and enters data when placed over the strip, scanning and converting it to computer code.

● *Cauzin Systems, 835 South Main Street, Waterbury, Connecticut, USA. Tel: 0101 800 533 7323.*

Omnis 3 on MultiMac

A SPECIAL version of Omnis 3 has been developed by Blyth Software to run on MultiMac, the new Macintosh compatible bulk disc networking system from HAL Communications.

● *Blyth Software, Mitford House, Benhall, Saxmundham, Suffolk. Tel: 0728 3011.*

● *HAL Communications, Invincible Road, Farnborough, Hants GU14 7QU. Tel: 0252 517175.*

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NEW FOR THE APPLE

DEVELOPMENT SYSTEM FOR 6502 - (SDS II)

SDS II is a developing system that was conceived to consent the writing and subsequent verification of software in assembler as well as circuit testing of devices operating on the 6502 Microprocessor.
SDS II allows the compiling of programs on Apple II / IIe using a common assembler of the BIG-MAC or TOOL-KIT type; the transferring of software onto equipment that is being tested and of allowing it to operate under its complete control, indipendant of how the memory of the tested equipment is plotted, by refering directly cto the labels of the source program.
Thanks to the varius types of hardware break points, it is possible to operate the system being tested at its normal operatating speed and to astablish a window in which the processor is managed by the SDS II, in such a way as to visualize the state of the system during the operating phase.

INTERRUPTIONS

On 2 + 10 break points at the end of a variable time, after a number of programmed instructions, on more than 1 parameter of the processor or memory. At the moment of interruption it is possible to edit and print all the parameters and the state of the system.

HARDWARE

- **microprocessor : 6502 (65CO2)**
- **support system : Apple II/IIe with at lest one drive**
- **clock frequency : 2MHx**
- **memory : 64 Kbyte**

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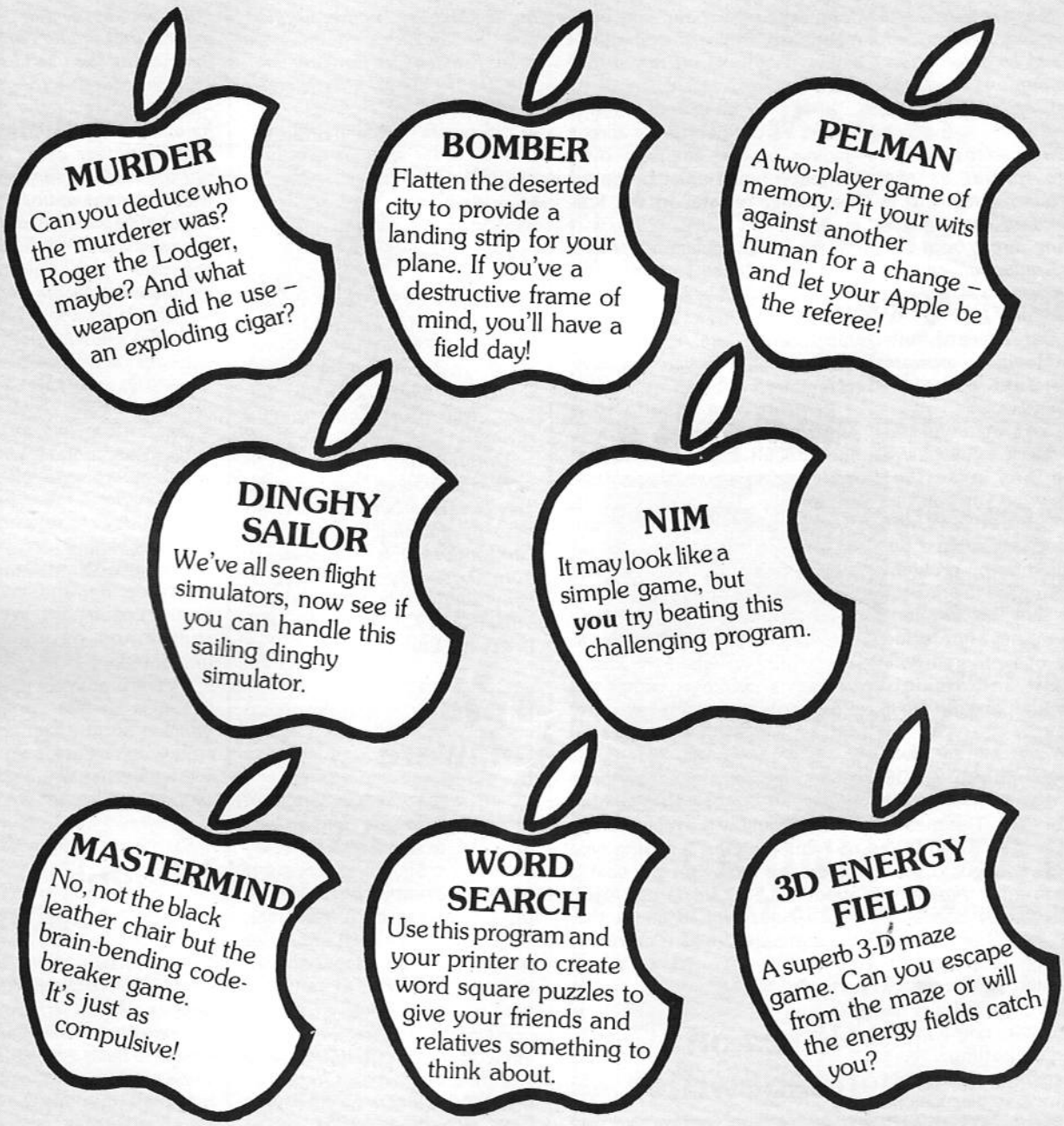

All the games are written in Basic and are fully listable so you can customise them to your heart's content.

You've got to agree the first Apple User Games Disc is great value. So order your copy NOW!

To order, use the form on Page 61

Putting a town on the memory map

I HOPE to prepare a town directory on my computer, and would appreciate any technical advice you could give me.

Please bear in mind that my understanding is extremely limited, so please use simple language.

This list is prepared from the register of voters. Ideally I would like to lift selected lines direct from the register by some form of image reader.

Normally, these registers are prepared according to wards, so I would need to be able to sort sections covering one road into alphabetical order by road name.

I would then need to print out in the same format as the directory in letter quality to a sufficient standard that a plate could be made direct from the printout. Any reduction can be made by camera.

I therefore am looking for appropriate hardware and software, and would appreciate any advice. – **John Siandish, Wisbech, Cambs.**

● I must admit that we can give no real advice because we don't have any practical experience of what you want to do. However, that was not enough to stop us having a go.

There should be no problem in finding a database to print out alphabetical lists to different criteria but you have to decide whether any one program will work quickly and flexibly enough at your price on your machine.

I estimate that the Ely town directory has about 3,600 entries and that 40 characters are needed for each. This means that approximately 145,000 characters are needed to hold the information – just more than one Apple 5in floppy disc.

I assume most towns have larger requirements which suggests that a hard disc may prove useful but not essential.

The problems come with inputting and outputting. I have no direct experience of direct image readers but discussions with a friend who has used a cheapish image reader (£400) were informative.

It was reasonably accurate – better than 95% – but only understood a small selection of print founts and was just faster than a skilled typist if the errors were not considered.

The interface between the output from such a machine and the input to your favourite piece of software may well be easy, but on the other hand may be a nightmare. Check it thoroughly if you decide to go down this road.

Your only other routes are a skilled VDU operator or direct reading of the council's own computer tapes which prepared the voting register in the first place.

This will almost certainly vary from authority to authority and I'm not at all sure how the new Data Protection Act affects such transfers of data. Presumably, whatever you do you will have to register.

Printing the results in a suitable camera-ready form is not difficult and the cheapest way is using a good daisywheel printer.

Your sample has various size founts and appears to be proportionally printed, so it will be useful to have different wheels on the printer and software that allows the user to pause printing when required.

This is common with word processors but not always with databases, so an integrated package may prove useful.

Another way to quality printing is the use of a laser printer. here the quality is excellent with no real problems in mixing type styles and sizes, but the cost is about £3,500 upwards, Again you would have to check that the software drives it correctly.

Max Parrott

Hi-res on Imagewriter

I WAS very pleased to see Max Parrott's article on dumping high resolution graphics on to an Imagewriter (Apple User, *September 1985) as I have a number of programs which use HRG.*

I duly entered the program and with a little fiddling got it to run on the IIe system at work.

However, the program will not work on the IIc I have at home. Could you please suggest any modifications to the program which might be needed for the IIc. – **Ross Pettigrew, Glasgow.**

● Sorry we're still trying ourselves, so far without success.

Lemi interface

I READ David Williams' review of the Lemi Midi interface in the January 1986 issue of Apple User *and tried to contact Computer Music Studios, the supplier mentioned in the review.*

Unfortunately CMS seems to have disappeared, but I may be able to save other readers some time by advising you that the Lemi interface is still available from Oxford Synthesiser Company who can be contacted on 08675-5277. – **D.C. McVie, Preston, Lancs.**

Epson answers

YOUR magazine is a source of inspiration to me and I look forward to each issue every month.

I am currently subscribing to my third year of Apple User, *which rates on my books as number one. Its German equivalent Peeker, is nowhere near as informative.*

Recently however you have become a source of irritation and frustration over Chee Wei-Li's disc updater program (Apple User, *November 1985).*

I am able to execute Listing II to check the number of tracks that the drive can access without problem. However when I try to update the disc I get the message "Error in formatting".

I have lost count of the number of times I have checked through the listing, all to no avail. Is there an error there that I have missed?

I would appreciate any information that would help me use this potentially useful routine.

In the March 1986 issue K.J. Ashton writes of the problems he encountered with his Epson 8132 interface card.

I too had the same problems with my card until I contacted Epson. They were able to supply me with an update ROM, which together with a very minor modification to the card solved the problem.

To my knowledge the card is 100 per cent operable with all currently available software, including PFS.

Epson also told me that the new production of the 8132 would incorporate this chip and modification – a comforting thought for those who already have the card. – **I.W. Nicholls, Ramstein, West Germany.**

● Thanks for the information on the Epson card. We suspect that many people will be interested.

We are actively looking into the disc updater program, as yours is not the first complaint.

It worked satisfactorily when we tested it and we promise to let you know what we find out.

Hitachi connection

I HAVE just bought a Hitachi colour TV with RGB input to use with my Apple II Europlus.

I have been to my local Apple dealer to have a lead made up to connect the two, but I was informed that my colour card was unsuitable as it gives a composite video signal. He then advised a new card costing nearly £100.

Another local computer repair firm told me if I got a circuit diagram for the card they could trace the RGB outputs and make the suitable connections. I have tried all the Apple

dealers in my area but to no avail.

The card is the Apple Pal Encoder Board and the monitor is the Hitachi CPT 1444. – **Alan J. Howlett, Bensham, Gateshead.**

● No one here has a Pal card. An Apple dealer should be able to receive technical help from Apple on the phone.

Perhaps a reader can help? Remember that RGB can be analog or TTL – check what your Hitachi expects.

Try Renumber

I WOULD be interested to know why, when you publish a program listing such as &DOS-FILE I am unable to use auto line numbering.

The listing starts incrementing by 10 up to 250 then by 1, by 2 at 272, an odd 289, back to 10, then I lose the logic of the line numbering after this.

It seems to be done just to make entry as difficult as possible. Hasn't Peter Harris heard of Renumber?

Also, why are listings printed on dark backgrounds and source files in such small print? – **David Pearce, East Sussex.**

● Sorry! You are right.

Dumping graphics

IN September 1985 Apple User, *Max Parrot seemed to have solved the problem of dumping graphics under DOS 3.3 by writing a routine that can be used under DOS 3.3 directly, although he didn't mention that it would also work on a IIc.*

I decided to take the gamble and try it. I don't think I made any mistakes but it doesn't work, so I am afraid I'll have to keep converting pictures to ProDOS, which seems to be the only officially supported Basic operating system for the IIc, with or without Imagewriter.

Is there a simple patch to make it run? – **L.F. Drost, Holland.**

● I wrote the program originally for a IIe driving an Apple Super Serial Card acting under both DOS and Pascal and was confident that it would work on a IIc because I understood that its serial port imitated the Apple card.

However, I was not able to check it out so I did not make the claim. I was subsequently able to borrow a IIc and found that the program would not work under either operating system.

By playing around I almost got it working, but without a technical reference manual I was unable to make it do so properly.

The trouble lies in the print routine at $95D0 which does not handshake properly. Perhaps someone with the necessary information can enlighten us.

Max Parrott

Sounds good . . .

IN your review of Skyfox in Apple User, *September 1985 you said that the sound effects are greatly improved if you have a Mockingboard.*

Do you need the Mockingboard to hear the title music? I am puzzled about this because I have an Apple IIc and can hear things like the plane blowing up quite well.

Could you also tell me the keys you have to press to play Space Invaders when you are at base?

Would it be possible to see more game listings in Apple User? *I have noticed that my back issues have more than we are now getting.* – **David Hallet, Suffolk.**

● Although Skyfox produces some sounds through the Apple speaker it produces many more if you have a Mockingboard fitted but since you have a IIc you can't make use of a Mockingboard anyway.

To save giving the base Invaders secret key combination to someone who doesn't want it let's say it's a combination of Control and a letter – that narrows it down to 26 possibilities.

Game listings take up a lot of space in the magazine so we feel a better approach is our *Apple User* games disc. For a very reasonable price you get fully listable games and save yourself a lot of typing. Watch out for Games Disc 2, coming soon.

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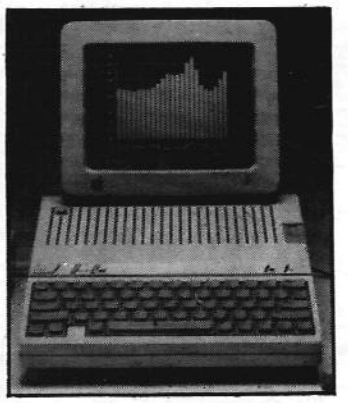

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February 1985

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

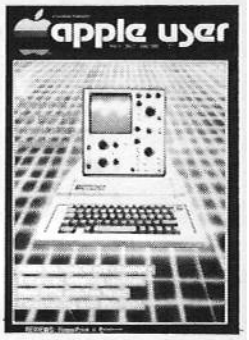
Apples in the dental surgery – Adding graphics commands to Applesoft – Using the VBLANK signal – Getting to grips with software – Reviews (Spee-Demon card, PFS File/Report for Macintosh, W-P-LAB) – Weather forecasting with Mac – Pascal Filer's D command – Fun and Games (La Triviata, Design Your Own Home: 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 with Apples – Graphics DIY Part XIII (pie charts) – Reviews (The Workbench, Macputer IIc, Copytext, Omnis 2 on Macintosh, seven Logo books) – The RWTS explained and demonstrated with a disc verify routine – protecting programs from Copya – Pascal (directory access from within programs) – Binsearch in Forth and Basic – Reaction Timer – Apples in Hungary – Fun & Games (Smart Shopper, Plantin' Pal, Micro Cookbook) – PLUS News, New products, Letters and Appletips.

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

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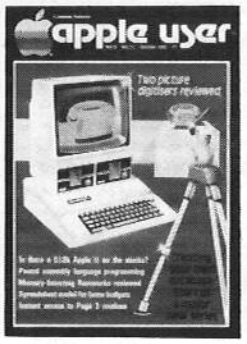
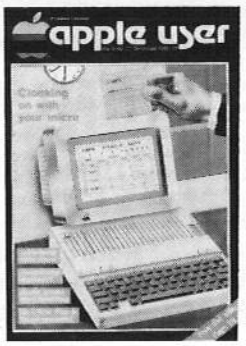


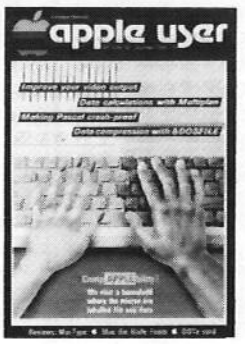
October 1985

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



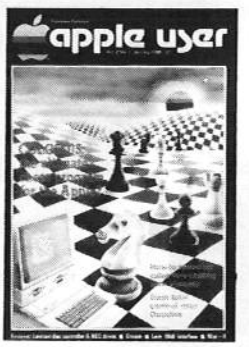
November 1985

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.



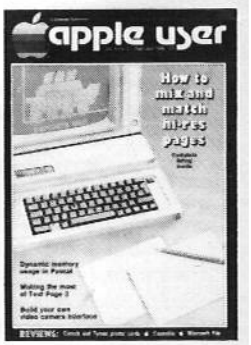
December 1985

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.

August 1985

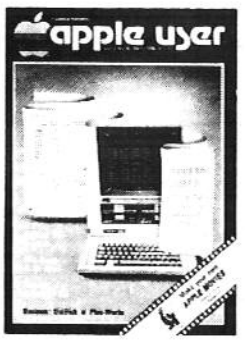
Spreadsheet secrets shared – Apple IIIs provide power behind computer bureau – Graphics DIY Part XV – Wordstar scrolling problems solved – Descartes data processing program generator – Fun & Games (Winnie the Pooh, Mickey's Space Adventure, Print Shop, Hitchhiker's Guide to the Galaxy) – Mac at the centre 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 – Bombproof input routines – Fun & Games (Skyfox, Wishbringer, Rescue Raiders) – Book reviews (Visicalc, Accounting software) – PLUS News, New products, letters and Appletips.

March 1986

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



April 1986

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

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