Apple User

Vol. 6 No. 11 November 1986 £1.25

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Learning about Pascal Units . . . exploring CP/M on the Apple

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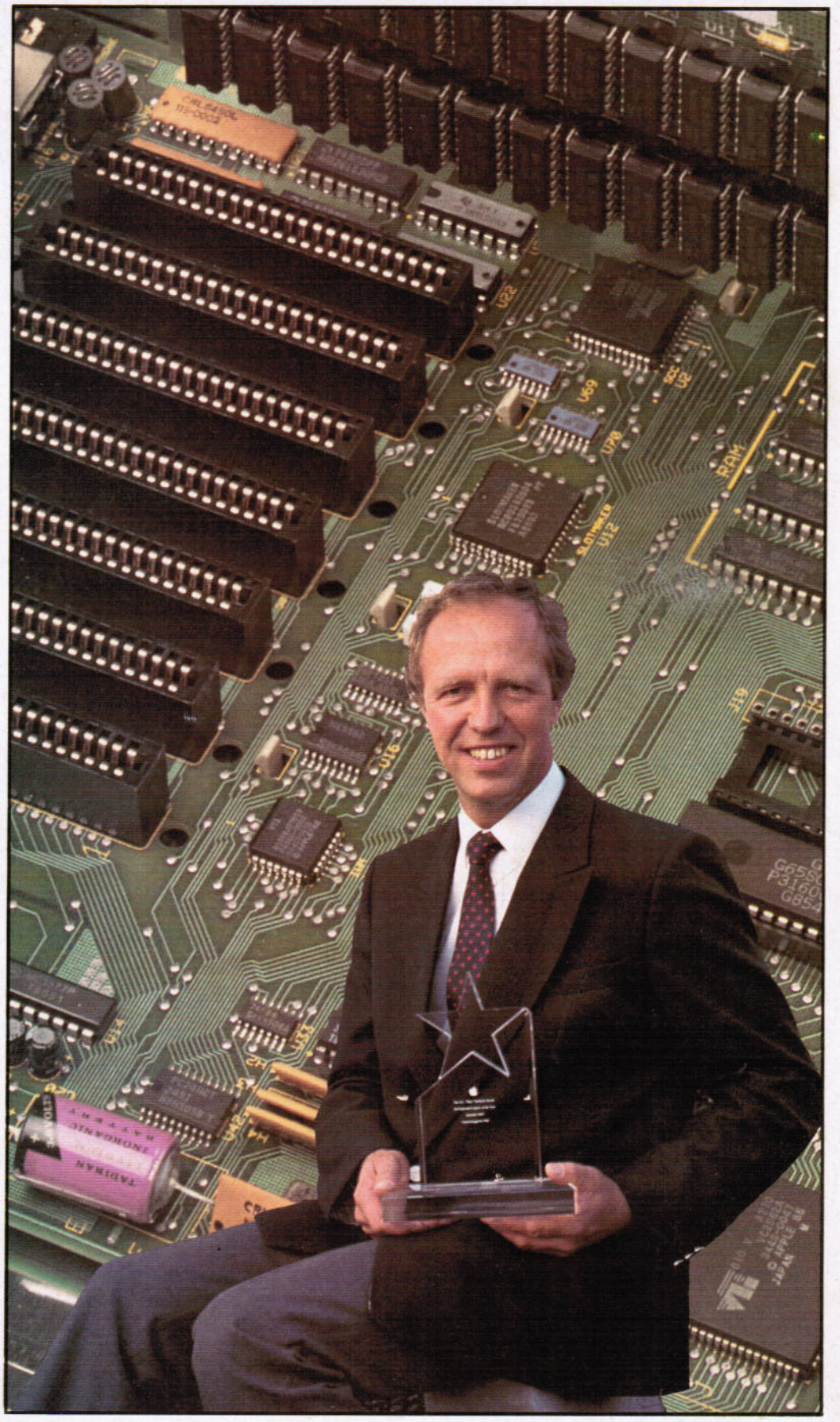
Chrysanthemum plot routine

Get to grips with desktop publishing

Reviews:
Apple Pascal 1.3
Peanut drive



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Volume 6
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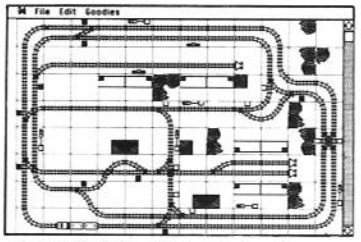

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Telephone: 061-456 8383 (Editorial) 061-456 8500 (Advertising) 061-480 0171 (Subscriptions)
Telex: 265871 MONREF G Quoting Ref. 72:MAG001 Telecom Gold Mailbox: 72:MAG001 Prestel Mailbox: 614568383
Published by Database Publications Ltd, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

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

Writing for Apple User: Articles and programs relating to the Apple are welcome. Articles should preferably be typed or computer-printed, using double spacing. Unsolicited manuscripts, discs etc, should be accompanied by a self addressed stamped envelope, otherwise their return cannot be guaranteed. Unless agreed, material is accepted on an all rights basis.

ABC 11,780 January-June 1986

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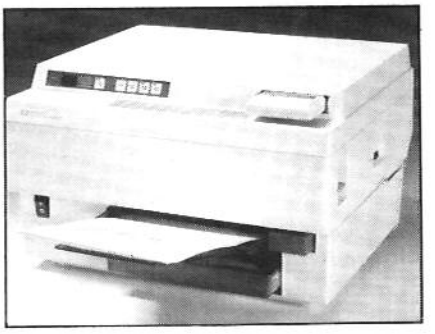

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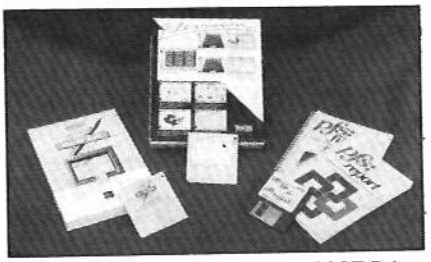

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Cirtech Z80 II+ & IIe	£37.80
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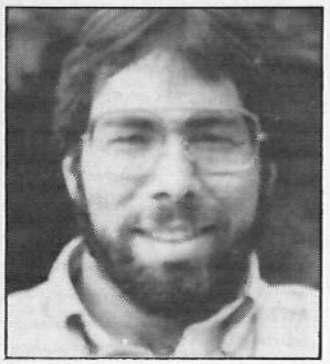

Wozniak at Apple World

APPLE co-founder Steve Wozniak will address a forum of Apple user groups during the forthcoming AppleWorld exhibition and conference.

Still a high level adviser at Apple, although he no longer plays a role in management, Wozniak joins a number of distinguished figures from business and education.

They include Dr Alan Kay, originator of the Macintosh interface, Dr David Hartley, head of computing at Cambridge university, and Professor William Gosling, technical director of Plessey.

AppleWorld takes place at the Business Design Centre in London from October 29 to November 1.

THE total worldwide installed base of Apple systems is now 4,167,041.

More than 70 exhibitors are due to attend, among them leading software houses such as Lotus, Microsoft, Ashton Tate and Aldus.

Wozniak will address the last of four daily conference sessions.

The first, on October 29, deals with higher education. The following day's subject is desktop publishing, while business solutions form the basis for the October 31 session.

Admission to the conference sessions is by invitation only. People who wish to visit the exhibition should contact their local Apple dealer or dial Apple UK on Freefone 100.

Apple UK is the country of the year

APPLE UK has won the coveted Country of the Year award given annually by parent company Apple Computer.

The British got the vote over Canada, Japan, Latin America, last year's winner Australia, and the traditionally strong Apple market of France.

A modern sculpture in glass, the award was presented to Apple UK managing director David Hancock at Apple's worldwide sales and marketing conference at Boca Raton, Florida.

Michael Spindler, president of Apple International, said: "Apple UK's performance in achieving 67 per cent revenue growth in 1986 over 1985 came from sound early planning. The award is a tribute to our British managers".

David Hancock said: "This award recognises the sophistication of the UK market within Apple's $2 billion worldwide operation.

"I am delighted that the skills and hard work of the Apple team at Hemel Hempstead have been acknowledged in this way".

Individual awards were won by Apple UK business development manager Peter Davies for his introduction of the highly successful AppleCentre concept, and by channel manager Len Saben for his work on desktop publishing.

IIGS is aiming at the schools

APPLE is confident that the new IIGS can win it a significant slice of the lucrative UK schools market for the first time.

Although Apple dominates the US education computer scene it has failed to make an impact here apart from in the university and college sector.

Like other manufacturers, Apple has found it difficult to compete against the government-backed BBC and RML machines in schools.

But with many educationalists now looking to upgrade to more sophisticated equipment Apple believes the IIGS is just the machine to satisfy their needs.

A recent conference of headmasters got a sneak preview of the IIGS and was "thrilled by the colour, animation and speed of the graphics", reports Apple II product manager Steve Johnson.

He told *Apple User*: "They thought the sound capabilities for music teaching were 'another generation' compared to what is currently available on the education scene.

"And when they saw the massive range of business and education oriented software that is already available for the machine they were ecstatic.

"I believe this indicates the IIGS is our best opportunity yet of breaking into the schools market from which we have historically been excluded".

Meanwhile Johnson sees small businesses being the major long-term purchasers of the IIGS.

"Initially we anticipate a flood of orders from existing Apple II owners who have been asking for more power and new features", he said.

"But business is where we expect our main sales to be.

"The IIGS was stacked up against the IBM, BBC Compact and Olivetti at a dealer-organised event for representatives of 300 firms.

"Those attending were so excited by the product they were literally queueing up in the corridors to get a second and third look at it".

Johnson believes software will be a key element in the success of the new machine.

"We have achieved higher than 90 per cent compatibility with existing Apple II software", he said. "In addition there is a wealth of good quality software specifically written for the IIGS which takes full advantage of all the new features".

What the critics say

"The IIGS will offer features no other machine has – I think Apple has made a smart move in releasing the machine at a sensible price, one that will allow the company to make a lot of money on peripherals".

Charles Wolf
First Boston Corporation

"This could be the final nail in the Amiga's coffin. Apple will have more success than Commodore and Atari in persuading programmers and hardware designers to develop add-on products".

Norman DeWitt
Dataquest

"The Apple IIGS designers' achievements are remarkable".

Gregg Williams
BYTE magazine

"The IIe to IIGS upgrade option could quickly create a large market for new software. If only 20 per cent of owners upgrade within the next six months, IIGS software will have an installed base of several hundred thousand. That could make the machine".

Fred Davis
A+ magazine

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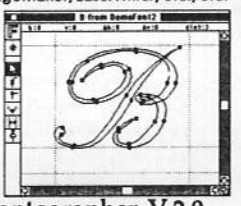

The MacSerious Programmers' Tool Shop

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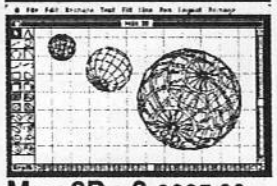

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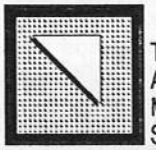

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PACIFIC

Sun power links islands

TEACHERS and administrators throughout the romantic Pacific islands of Micronesia are using solar-powered Apple IIc systems.

With the aid of a customised Access II program they are able to communicate with each other via satellites and high-frequency radios.

Data communication is vital to the devlopment of the mostly isolated islands, which are among the smallest nations in the world.

To help them Apple's distributor on Guam trained Micronesian educators in the use and maintenance of their Apple II systems.

As well as providing a much-needed means of communication, this has also introduced computers to teachers and students on even the most remote islands.

CANADA

MICHAEL Cartier, manager of the Macintosh laboratory at the University of Quebec, Canada, has designed an innovative iconic programming language.

Nicknamed Cartier's Protocol, the language provides a new learning model using 380 symbols in a code for visual communication.

For example, a tortoise means slower and a hare means faster.

Cartier believes his system will bring ease of electronic communication to many people who have yet to learn the benefits of computer use.

He sees particular potential for his system in the fields of teaching and electronic publishing.

SWITZERLAND

MUCH of the activity on the stock exchange in Basle, Switzerland, centres around 130 Macintosh computers running two Swiss software packages – System 20 and System 150.

These are used for Basle's stock exchange information broadcasting system.

Eighty computers on the stock exchange floor are connected to a Vax computer and used to communicate stock information via FM radio signals to other Macintosh systems at banks and investment houses throughout the country.

By the end of this year the number of Macintosh computers in the system is expected to total 200.

BELGIUM

Gospels in a IIe

MONKS at the medieval Abbey of Mardesous in Belgium are using an Apple IIe in their study of the gospels.

They have entered four gospels into the computer and developed a program which provides an index of the contents.

The program even includes a concordance – an index of specific words.

The software, which allows the user to trace the use and meaning of words throughout the gospels, is sold by the Abbey to Catholic schools and monasteries in French-speaking countries throughout the world.

Not to be outdone, monks in the main Greek Orthodox monastery on Mount Athos – a secluded, holy place in Greece – are handling their administrative affairs with the aid of a Macintosh.

And in India, where most people will not make an important decision without consulting their stars, a fortuneteller in Delhi is using a Macintosh in his astrology practice.

Apple round the world

FORTY internationally acclaimed photographers have been busy snapping Apple users around the world.

Commissioned by Apple's creative services department, their assignment has been to capture on film the wide diversity of ways people are using Apple products in their daily lives.

More than 40,000 pictures have been taken so far showing Apple micros in a variety of locations from modern industrial cities to remote African schools.

The project is part of Apple's upcoming 10th birthday celebrations and the pictures will be used in company promotions and exhibitions.

JAPAN

LIKE most metropolitan areas, Tokyo suffers from chronic traffic jams.

But with a little help from Apple, the canny Japanese are finding ways to make the snarl-ups productive.

While many commuters use car phones to carry on working in heavy traffic, one Tokyo businessman has gone a step further.

As he sits in his RX7 sports car he works on his Macintosh,powered by the car battery via a converter, enabling him to use programs like MacVision, Macpaint, Graphics DB and EgWord – the Japanese word processing software.

Using a cellular telephone and a portable fax machine, he can send messages to his office.

Right now he is testing an in-car modem and fax interface to send files directly from his micro to his office while stuck in the traffic.

ITALY

A GROUP at the archaeological institute of Bologna University in Italy has created and tested an innovative use for the Macintosh in uncovering historic sites.

Each archaeological "dig" is videotaped, and the most interesting representations are digitised and visualised using MacVision.

Next they are notated and enhanced, using MacPaint or MacDraw.

Finally the images are matched with analytical reports and filed in a graphic database for future reference.

AUSTRALIA

MACSTUD IS NO BULL

A SPECIAL program has been developed to manage cattle breeding and financial control at a 20,000 acre ranch in Australia.

Called MacStud, it keeps track of the mating activities and calf yield of 2,000 head of cattle.

For the ranch's big cattle sales, an arena holding 800 buyers is built, with a Macintosh in the middle to document deals.

Apple Euro-link set up

APPLE users can now have instant access to Europe's most influential database, thanks to a new permanent electronic link to Luxembourg.

It has been set up by MicroLink in conjunction with the EEC's Directorate General for Information Marketing and Innovation.

The venture provides a direct link between the main MicroLink computer and that of Euronet/Diane, which is part of a far reaching project by the European Commission to create a "Common Market of information".

It means that MicroLink now has access to more than 600 European databases.

Databases available to MicroLink subscribers through the new European link contain information from many sources which are not available through any other on-line host.

Among the facilities on offer is a multilingual terminology databank of scientific and technical terms containing more than 380,000 words.

It is being updated at the rate of 2,000 new items a month.

The European link-up comes only weeks after MicroLink achieved a similar world first – a transatlantic connection with the giant American database Mnematics which includes areas dedicated to the Apple II range and Macintosh.

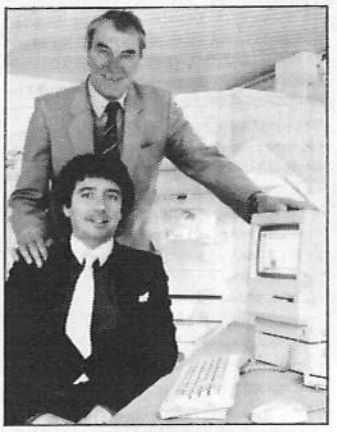
"Our latest link-up will prove invaluable in opening up new business and computing opportunities for Apple users in Europe", said Derek Meakin, head of MicroLink.

Another outlet opens

THE seventh addition to the expanding nationwide network of AppleCentre outlets has opened its doors in Manchester.

A partnership between Apple and CSS Systems, it will serve business, professional and educational users in the North West of England.

Apple intends to have 50 dedicated outlets open by the end of next year. In addition to Manchester there are now stores in London, Edinburgh, Cardiff, Nottingham and Basildon.



Pictured at the new premises are CSS managing director Les Hart and Manchester AppleCentre manager Arthur Barrow.

Now its easier to get the gear

THE Apple Card credit system is being re-launched with major changes intended to make it more attractive to potential customers.

From now on Apple Card can offer purchasers instant credit up to £2,500 within about half an hour of them walking into the shop.

The Apple Card is specifically aimed at professional users who require an Apple computer to increase their productivity.

All a customer has to do is select the product he wants, complete an application form, have his credit approved – usually within half an hour – then take the goods away.

He will then be sent an Apple Card by mail, and will receive monthly statements showing credit available and balance payable.

Additional purchases can be made by merely showing the card and signing for the goods.

The company has also introduced Apple Rent, a special leasing package offering business customers a more attractive way of financing their purchase of Apple equipment.

Developed by Apple UK's finance department and administered through Lloyds Bowmaker, it is designed for medium to long-term loans.

Customers will benefit by being able to offset leasing payments against tax, relieving them of capital budget decisions.

No deposit is required and price stability is ensured by fixed rental.

Desktop publishing drive

APPLE has launched a major new desktop publishing promotion which will run until the end of this month.

It offers a full desktop publishing system for £8,495 – around £2,000 less than the normal selling price.

The special bundle includes Macintosh Plus, MacWrite, MacPaint, PageMaker, MacDraw, CricketGraph, LaserWriter Plus, HD20 and Appletalk connectors.

The promotion, supported by national advertising and a repeat of the Apple Challenge, offers a configured HD20 with about 100 special pre-designed templates to help users design their own publications.

Apple desktop publishing manager David Jones said: "The templates we have included in the new bundle will allow novice users with no page layout skills to construct professional-looking pages without the hassle of designing them.

"All they will have to do is insert their own text, headlines and pictures into the grids provided".

The layouts come from all over the world – from Apple itself, Adobe, Aldus and McQueens.

CricketGraph is the new business graphics program from Heyden & Sons which offers 3D graphic effects.

PageMaker enhanced

AN enhanced version of Aldus Corporation's PageMaker will be available in the UK next month.

It has more than 20 new features including improved control over typographic quality through kerning and variable word spacing.

It incorporates dictionary-based automatic hyphenation and justification, the ability to design and edit facing pages as two-page spreads, and can handle publications up to 128 pages in length with a page size of 17 x 22 in.

PageMaker Version 2.0 will cost approximately £450.

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SR234A	Serial	25D	4 way	£245

PARALLEL PRINTERCROSSOVER SOLID STATE MANUAL

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IPX	25D(IBM)	2X2	£85

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Latest Pascal offers a lot, but at a price

Stuart Bell reviews Apple Pascal 1.3

APPLE II Pascal 1.3 is both the latest and largest in the series of Pascal programming environments offered by Apple computer in the past seven years.

Latest because, available in this country only since August, it is in fact the fourth generation of Apple Pascal (see The Generations of Apple Pascal), Largest because it arrives in a box almost a foot square containing the new Workbench style of documentation, a three-ring loose-leaf binder containing almost a thousand pages.

Indeed it is perhaps the documentation that most sets 1.3 apart from its predecessors so we'll deal with that first. Buyers of 1.2 opened its box to find a spiral-bound Language manual and Operating System manual.

Because they referred to 1.1 a similar 1.2 update manual was included, together with an addendum to each, Apple Pascal – a hands-on approach by Luehrmann and Peckham was also there, making a daunting total of seven pieces of documentation.

In their place, 1.3 has but one. All the information of the old set is there – although without the hand-holding tutorial material of ". . a hands-on approach". Rather, the material of the manuals proper has been rearranged into an order that is more helpful to the inexperienced user.

For example, the first "book" in the manual is called Getting Started, and guides the user through the start-up process on a range of Apple II configurations.

Program Preparation Tools guides the user through the Command Level, the Filer, Editor, Compiler, Assembler, Linker and Librarian. 1.1 users will recognise this as being the content of the old Operating System manual.

Indeed much material is simply a slight re-write of that stuff. Old sentences can be recognised, frequently with only small grammatical changes. However, a real effort has been made to reorder the material in a more helpful manner and additional diagrams have been used where necessary.

What transforms the manual is the use of proper typesetting, a very clear layout and style, and excellent lists of contents and indexes. Spacious layout has its cost, of course – the sheer size of the result.

The 1.1 manuals were really only re-hashes of the documentation produced at the University of California before Apple bought rights to the UCSD p-System. Now much effort has clearly been made to re-edit and add to that material.

Furthermore, 1.1 dated from pre-Apple IIe days. Thus users of 1.2 has to refer to the update manual to find information specific to that machine. Also, in the days of 1.1, 40-column Apples were the norm. The 1.3 manual reflects the fact that most users can now see 80 columns.

In particular the section on 6502 Assembly Language programming is much augmented, and should provide a far better description of the use of the assembler and linkage of Pascal and assembly language programs. A series of 6502 macros is given in an appendix, demonstrating the power of the assembler.

1.2 introduced the 128k Pascal system, allowing users with IIcs and enhanced IIes to make use of auxiliary memory, with a significant improvement in facilities offered by the system. Now the 1.3 manual can deal with 64k/128k differences where appropriate and the two are treated as complementary, rather than the larger one seeming to be an afterthought.

An indication of the writers' attention to detail is that the explanation of the p-codes has been amended to reflect the fact that a couple are different when the extra memory is in use. However, while a 128k 80-column Apple IIe is treated as the new standard, users of older machines are not neglected and 1.3 still provides full support for the 40-column II+.

The second main book is the Language manual. Whereas the 1.1 manual assumed a knowledge of Pascal, and explained only differences between "standard" Pascal and Apple Pascal, we now find a description of the whole language. Each feature is treated in some detail, with examples of its use. This is a vast improvement – but the manual fails to distinguish between features of standard Pascal and Apple Pascal. This might prove a problem for someone who moves to another Pascal later.

A programmer proficient in another language will find enough here to start programming. However, I suspect that the total novice will need some additional help. Again the layout is clear, and the text is interspersed with chunks of source code and the usual syntax diagrams.

One minor complaint. In the chapter of Miscellaneous Information, code is given for peek and poke operations. However, no warning is given that peeks and pokes that work in Basic will not work under Apple Pascal. In any case, a fundamental printiple of the p-System is that the user should be unaware of the underlying hardware. Except in very special circumstances, peeking and poking should be unnecessary, and the manual should not encourage such un-Pascal machine specific practices.

Finally, the Technical Reference book collects together much information that only experienced users will need, and which was spread around the old manuals. Indeed some information is given in a more detailed manner (for example, Segment Dictionary structure) than before. Now that Version IV of the UCSE p-System is being sold at £65, with a corresponding reduction in the level of documentation, the Apple Pascal 1.3 manual provides the most detailed technical documentation included with any version of the p-System. As with all the books, a number of appendices augment the contents of the chapters with various tables, summaries and diagrams.

In short I became very impressed with the new manual. Clearly much work has gone into producing a very professional product. I have but two minor reservations. Firstly, the sheer size of the binder might be a problem, in that with my copy the weight of the pages pulled the metal ring mechanism away from the board binder. A couple of small nuts and bolts replaced pop rivets that were never man enough for their task.

Secondly, having used the old set for five years, the soft-cover spiral bound manuals had become my flexible friends. Now I must learn a whole new layout. Such is the cost of progress. I've no doubt that new users will find the 1.3 manual excellent.

For any software product, while the documentation is important it is secondary to the software itself. In the case of Apple Pascal 1.3, we have a whole programming development environment. To describe it from scratch would be impossible. I'll restrict myself to describing the changes from 1.1 and 1.2.

If you've never seen Apple Pascal before, let me simply say that it is arguably the best Pascal development system available on any 8 bit micro, and better than those on many larger machines. Having used the p-System since 1980, I might be a little biassed.

As far as the language is concerned, the main addition is an optional OTHERWISE clause to the CASE statement. Standard Pascal generates a run-time error if the case selector is a CASE statement does not match any of the labels, whereas UCSD Pascal simply drops-through if no match is found. Now programmers can define special action to be taken in this event. This is a sensible minor addition to the language, even if it will reduce program portability.

Two new data types have been added, BYTESTREAM and WORDSTREAM. In particular, variables of these types – effectively arrays of indefinite length – can be used as parameters to procedures. Standard Pascal allows conformant arrays. That is, an array can be passed as a parameter into a procedure without the length being specified. Thus, the procedure can work with arrays of any length. This is very useful for the production of general-purpose array manipulation procedures.

UCSD Pascal does not allow conformant arrays (except for Version IV.2 which now does). Apple Pascal 1.3, while not implementing them fully has at least partially relaxed the restriction on the need to know the size of an array passed as a parameter. There is a price to pay for such improvements, and the Compiler has grown slightly larger.

Thus on 64k systems swapping may have to be invoked when the 1.1 or 1.2 Compiler did not require it, with a consequential detrimental effect on compilation speeds. I encountered this with the relatively small PRIMES benchmark, having to invoke swapping to compile the program under 1.3 (but not needing to under 1.1 or 1.2.)

Apple II+, 64k, Titan Accelerator				IBM PC
	Apple Pascal:			Version IV.03 p-System.
	1.1	1.2	1.3	
SIEVE:	114	112	108	230
KRUNCH:	25	26	27	
PROC-CALL:	80	78	72	

Table 1: Benchmark performances

There have been a number of minor changes. REMSTATUS – introduced only in 1.2 – has been replaced by an enhanced UNITSTATUS, which reports the status of the printer, remote i/o, and also returns the size in blocks of discs connected to the system. With the advent of logically larger discs, the advantages are clear. The Filer now also reports the sizes of discs when a Volumes list is given.

The system itself has been fine-tuned in a number of places Size restrictions – for example procedure sizes and the number of procedures allowed – have been increased and CHAINing facilities have been improved, as has the EXEC file provision. Some system prompts have been changed and made less cryptic. I note that the references to ETX have been replaced by Cntrl-C, the key which usually generates the Ascii code ETX. Beginners will no longer search the keyboard in vain for ETX.

As regards performance, the documentation claims that some p-codes have been re-written, notably those for procedure and function calls and returns. The results of benchmark tests are shown later. Also we are told that "screen output routines have been improved for speed". Measurement is difficult, but there did seem to be some improvement.

The system will now boot from slots 4, 5 or 6, rather than only 6. Support is given for the Profile Hard Disc, the UniDisk 3.5 and Apple's new Extended Memory Card, using it as a RAMDISC. Also, the FORMATTER utility will format the Profile (be careful!)

Again, these improvements to the BIOS (the Basic Input Output System) have a cost. To make room for them the IDSEARCH and TREESEARCH routines have been removed. Thus user programs can no longer use them – though few programmers will miss them – and they are now built into the Compiler, which does need them, as 6502 code routines.

In summary, the changes to the system indicate a continuing development of the system, rather than a dramatic change. 1.3 is very much in the line of its predecessors. However, whereas 1.2 included a large number of bug-fixes – some of a very esoteric nature – 1.3 represents more of an attempt at stabilisation, particularly in the area of documentation.

As 1.2 was larger than 1.1, so 1.3 has grown again. I feel very strongly that with the p-System, "small is beautiful", and hope that Apple Pascal will not grow any further. While program development with one disc drive was messy under 1.1, I suspect that it is really non-feasible with the slightly larger files of 1.3.

Having said that, perhaps the most impressive part of the 1.3 package was the smallest – a 800k UniDisk 3.5, containing the whole of the Pascal system (also supplied on four $5\frac{1}{4}$" discs), with space to spare. An Apple II with a couple of UniDisks must be a very nice machine!

I ran a few simple Benchmarks on the three versions to see how both CPU-intensive and disc-bound performances had changed. Table I is the infamous Byte benchmark (infamous because of its susceptibility to fine-tuning to improve results) which gives a

APPLE PASCAL'S FAMILY TREE

1.0: 1978
Essentially UCSD Pascal version 2.1, repackaged by Apple but with little customisation. Unfortunately a rather bug-ridden release, with no support for anything other than the simplest peripheral cards. The manual was virtually a reprint of UCSD material.

1.1: 1980
Vastly improved spiral-bound documentation. Exec files added to system. The SYSTEM.ATTACH facility enabled special device-drivers for particular peripherals to be loaded at boot-time. No support for the special facilities of the Apple IIe. A perfectly usable system.

1.2: 1984
Introduced the 128k system for extended IIe's and IIc's permitting larger programs and improved library facilities. Used 1.1 documentation, together with a "1.2 Update Manual". Many bugs in 1.1 corrected – most of which were very obscure.

1.3: 1986
Totally re-written and much improved documentation in Workbench format. Various minor improvements and support for Profile and UniDisk 3.5. Orientated towards 128k systems. 64k systems have less memory for compilation than under 1.2.

Also:

Version IV p-System for Apple II: 1982.
Version IV.13 now re-releases by Pecan at £65. Apple II's are really too small – in terms of both memory and disc space – for Version IV, producing lethargic performances. However, it does give code-file portability with larger machines running the p-System. Version IV.21 should be out soon on the Apple, using Auxiliary Memory, with a possible consequential improvement in performance. Not recommended unless compatibility is essential.

rough guide to CPU and memory performance by calculating prime numbers. The figures for an accelerated Apple running 1.1, 1.2 and 1.3 are shown, with those for an IBM PC for comparison.

I compared disc access speed by using each version in turn to krunch (compress) a disc with files scattered over the disc. Finally, I tested Apple's claims to have improved procedure and function calls and returns with a program that calls a parameter-less procedure and a function one hundred thousand times.

To conclude, I must mention three points which are not complaints so much as wishes. Firstly, wouldn't it have been nice if the 1.3 Editor had been ASE? ASE is the Advanced System Editor, an enhancement of the standard product produced by a software house in the States which will edit very large files, has vastly improved cursor-control and offers programmable function keys – even on an Apple II+. For years various people have tried to persuade Apple to take it as their Apple Pascal Editor – to no avail.

A debugger would have been a useful inclusion too. A debugger lets you single step line-by-line through a Pascal program, examining variables as they change. It's great for finding run-time bugs in programs. UCSE write a rather bug-full one, and Apple Pascal 1.1 contained a stub so that one could be added to the system if/when the debugger was debugged. I wrote one for my own system. However, Apple gave up and even removed the stub (segment 2 in SYSTEM.PASCAL) in 1.2.

Thirdly, on a personal note, the Apple Pascal 1.2 update manual contained details of USUS, the p-System Users' Society with which I'm involved. It only mentioned the USA branch, not the UK one, but now the super new 1.3 manual makes no mention of us at all.

Despite these unfulfilled wishes, I do feel that Apple Pascal 1.3 is a fine product with a superb manual. But is it worth the price? If you have yet to buy Apple Pascal, and are seriously interested in using the language to produce non-trivial programs, then I would strongly recommend the package. The more I read the manual, the more I became very impressed with it.

Ironically, the half-price upgrade offer is perhaps less of a bargain. If you have new Apple products, such as the UniDisk 3.5, Extended Memory Card, or Profile hard disc, and are without support for their use with your current version of Apple Pascal, then clearly the upgrade will be worthwhile. However, to existing users of Apple Pascal on less sophisticated systems – particularly 64k ones – the latest version may appear to offer little for the price.

Title: Apple Pascal 1.3.

Publisher: Apple Computer UK. Requirements: Apple II, II+, IIe or IIc, with 64k or 128k and at least one disc drive. 80-column display, 128k, and either two 5¼in drives or a UniDisk 3.5 recommended.

Price: £195.

Upgrade Offer: Until December 19, 1986, send £113.85 plus an original APPLE1: disc from Apple Pascal 1.0, 1.1 or 1.2, to Apple Computer Pascal 1.3 (Upgrade Programme), Sacombe Press Unit 1 Langley Wharf, Railway Terrace, Kings Langley, Herts. WD4 8JE. Offer includes the new manual.

Readers may like to know that USUS (UK) may be joined by writing to PO Box 448, Chelmsford, Essex CM2 8QB. USUS (UK) also operates an electronic mail closed user group on MicroLink but you have to join USUS to use it.

Rowdy Peanut ...a model of oriental order

Cliff McKnight reviews the Peanut external disc drive and finds it a trifle off colour but nonetheless a worthy companion to the Apple IIc

THE built-in disc drive of the Apple IIc is a great boon and makes the machine more portable than its IIe sibling. However, for many applications a second drive is necessary, either to avoid excessive disc-swapping or simply because the program demands two drives.

Over the last few months I've been giving my Apple external drive a rest while I put the Peanut drive to the test. Of course, where a disc drive is concerned, the real test is whether the user is aware of it at all. The perfect drive is simply a hole where you shove your discs without thinking.

By this criterion, even the "official" Apple drive is not perfect. I'm quite used to "check disc drive" messages and to the disc not ejecting properly. On the whole though, the Apple drive has performed well and has not needed any attention.

So how does the Peanut drive shape up? Well, its performance seems to be up to the same standard as the Apple drive, which is to say I've had a few "check disc drive" messages but nothing serious.

I haven't had any problems with discs failing to eject though, because the Peanut drive doesn't have any spring-loading. To load a disc you just slide it in as far as it will go and turn the little lever through 90 degrees. Unloading is the exact reverse – no fancy eject mechanisms and no jams either.

Typing PR#7 on a IIc causes it to attempt to boot the disc in the external drive. I say attempt because sometimes the software diverts attention back to the internal drive.

However, I've been using this feature a lot recently as an additional means of testing the drive and it hasn't failed yet. Everything which will boot from an external drive has done so from the Peanut.

It's also performed perfectly well under a variety of operating systems including Dos 3.3, ProDOS, Pascal and CP/M, each of which uses a different disc format. Files written on the Peanut drive have been perfectly readable on both the internal and external Apple drives.

Physically, the drive is slimmer and narrower than the Apple drive. It's what used to be known as half-height when the norm was the fat DiskII. The casing is a similar colour to the old drives, which means that it no longer matches the stark white of the modern Apple.

In operation the Peanut drive has a louder, more obvious motor noise than the Apple. It took a bit of getting used to at first, but its read/write noise is slightly quieter.

Connection to the IIc drive port is via a nice slim ribbon cable rather than the fat, difficult-to-bend Apple cable.

As well as the Peanut badge, the drive also carries the name Technico and a Made in Taiwan label. Even without the label its eastern origins are betrayed by the cardboard packing piece which bears the instructions "Do not destroy this sheet. It must be inserted and closed the door in transportation". A dead giveaway if ever I saw one.

Although the drive is Taiwanese, the drive mechanism is Japanese. I used to wonder how they got everything into a half-height drive until I took the case off one and then the answer was obvious – they took all the empty spaces out.

The Peanut drive is no exception, its innards being a model of oriental order with no signs of botching or afterthoughts.

There's at least one redundant component, though. Some disc systems – the BBC Micro's is a case in point – use the little hole in the floppy as a means of synchronisation, and the Peanut drive has the necessary optical sensor to do just that.

The Apple of course makes no use of it, which is just as well for those people who are in the habit of using the backs of single-sided discs. BBC owners have never needed to worry about the possible dangers of doing this because they are denied the opportunity. Turning a disc over means that the optical sensor is permanently in the dark and therefore there's no synchronisation.

It also has an optical write-protect switch, which is fine unless you're the kind of loony that uses sticky tape for write-protect tabs. I've heard that such optical mechanisms "see through" coloured discs, which means that you wouldn't need a notch cutting in order to write to the back of the disc.

However, the only coloured disc I own – a pumpkin-coloured specimen – produced nothing but I/O errors when I tried to write to the back so I am unable to confirm the rumour.

Given that the Peanut drive has been reliable over the test period, what advantage does it have over the official product? The obvious answer is the price: at £105 excluding the ubiquitous levy, it has a clear advantage over the £120 Apple external drive.

Unless you're into colour-matched accessories the Peanut drive will provide a perfectly adequate companion to your Apple IIc, saving you both money and an awful lot of disc-swapping.

Product: Peanut IIc External Drive.
Price: £105.
Supplier: Peanut Computer, Unit 20, Low Mill, Dewsbury WF13 3LX.

You've got just 4 days to dis

October 29th, 30th, 31st and November 1st are the days. The Business Design Centre in London is the place.

And AppleWorld is the event — the most important personal computer event ever held in this country.

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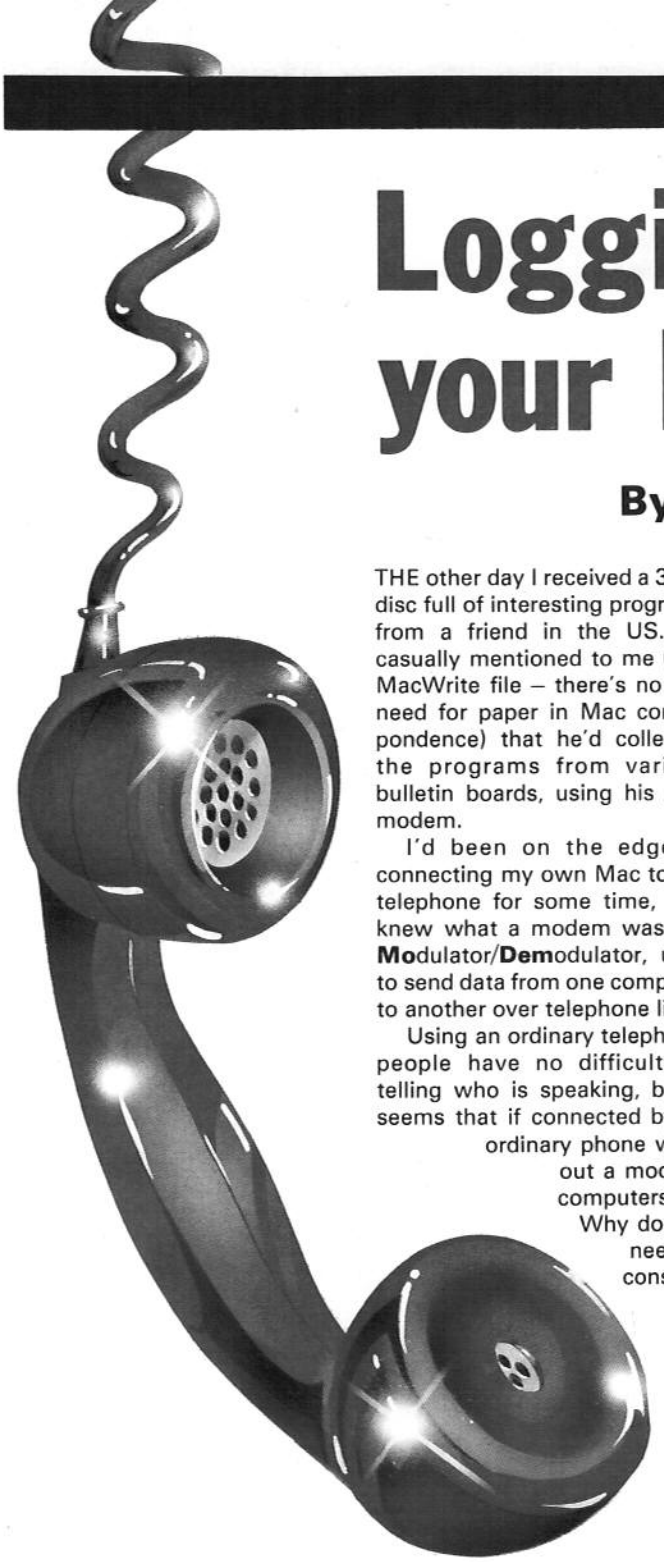
Apple™
The power to succeed.

Logging on with your Macintosh

By Duncan Langford



THE other day I received a 3.5in disc full of interesting programs from a friend in the US. He casually mentioned to me (in a MacWrite file – there's no real need for paper in Mac correspondence) that he'd collected the programs from various bulletin boards, using his new modem.

I'd been on the edge of connecting my own Mac to the telephone for some time, so I knew what a modem was – a **Mo**dulator/**Dem**odulator, used to send data from one computer to another over telephone lines.

Using an ordinary telephone, people have no difficulty in telling who is speaking, but it seems that if connected by an ordinary phone without a modem, computers do. Why do you need to consider connecting your computer to the telephone? *TeleLink,* a companion magazine to *Apple User,* is well worth reading. It will give a good picture of the telecommunications options available to all computer users, and provides a useful introduction to the world of MicroLink, Telecom Gold and similar computer/telephone packages.

I joined MicroLink, but found rapidly that for my particular needs the cost limited my access. As a Mac user, I was looking for something which could be of specialised help to me – and which wouldn't be too expensive.

What exactly was I looking for? Well, contact with other Mac users would be welcome. If possible, the ability to obtain otherwise hard-to-get programs would also be a big incentive.

Unless you live near a big user group, the chances are that you're largely dependent on a dealer for software. Of course dealers are in turn understandably reliant upon Apple and commercial software producers – there's little economic room for "shareware" and "freebee" programs.

An additional difficulty is that even authorised Apple programs, which will eventually be available from your friendly local dealer, are frequently available from the USA well before we offically see them here.

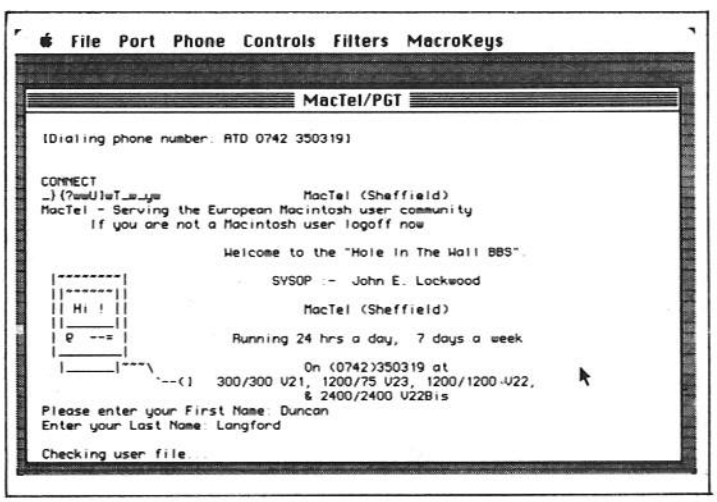
For example, the US 5.3 System/Finder 4.0 combination was available from MacTel (see box) in the UK months in advance of its official release.

The ability to gain programs, advice and contact through MacTel was sufficient for me. Your reasons may be different, but assuming that you have made the decision to go on-line (one of a whole new list of buzz phrases), you will need three things to successfully connect your Mac to another computer:

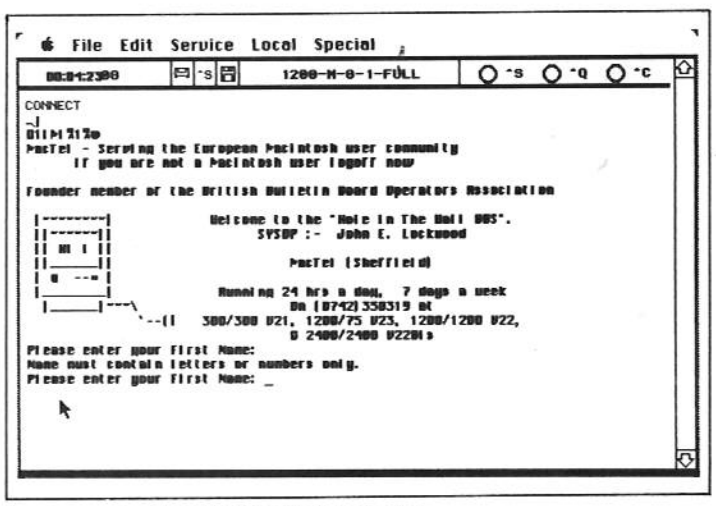
- The modem itself.
- A new-style BT socket.
- Some suitable software, to filter your programs and data to and from the modem.

I started by looking for a suitable modem.

When one computer talks to another over the telephone line, they exchange data at various fixed speeds – 75, 300, 1200 and 2400 baud. Basically, the cheaper the modem, the slower the speed – so the longer everything takes.



Logging on to MacTel using PGTerm



Logging on to MacTel using Red Ryder 9.2

Cheaper modems – those under about £200 – also tend to insist that you dial all calls yourself, only turning things over to your computer when you hear the distant machine whistling at you. Usually they also have switches to set the buttons to press, and thus in general seem rather complicated to operate.

Although I bought a Mac to avoid complications, after a look at the prices of auto-dial 1200 and 2400 baud modems – which can reach £600! – I had resigned myself to a do-it-yourself 300/300 machine.

Then I saw an announcement for the new WS4000 modem from the modestly named Miracle Technology – full 300 baud operation, plus 1200/75 (to access Prestel), plus a rather cunning arrangement that swops 1200/75 into 75/1200, thus fooling software into thinking the modem can operate at 1200/1200 baud.

As no US software can cope with the idiotic Prestel split rate, this option allows you to use "normal" US communications programs. In addition the WS4000 had full autodial and autoanswer, was upgradeable to higher specifications and cost only £149.

It was the obvious choice and I bought one.

I already had a new telephone socket, which I'd expectantly installed by my desk some time ago – in the meantime it's been very useful for a telephone!

Software was more difficult. My American friend had given me a copy of the "shareware" program Red Ryder, version 9.2. This is a very complex "all bells and whistles" communications package.

For example the manual, which is on disc, takes about an hour to print. Although undoubtedly very powerful, I found Red Ryder rather intimidating.

As someone new to telecommunications I felt, initially at least, that I needed a very simple package. The UK product Vicom appeared excellent, but its cost rather reflected this.

I'd also heard good things about the old Mac communications standby, MacTerminal. After some research, though, I found that another shareware program, PGTerm (PrettyGood Terminal) did all that I needed.

It's certainly well worth trying out different communications software before deciding which to buy. In this field individual needs do result in a considerable variation in what is seen as suitable software.

Shareware, available from user groups and MacTel, allows you to first try the software, only paying if you keep it. You may feel that this is an obvious first choice – it also tends to be cheaper. However, do please pay the developer if you continue to use shareware.

Readers of *Apple User* will probably remember that my old faithful 128k Mac is now putting up an excellent impression of a MacPlus. This of course meant that to connect a modem to it, I needed a connecting lead with the new tiny tiny DIN plug.

After panicking, I finally

```
[Dialing phone number: ATD 0622 886111]

CONNECT

MAI\A001-6220040003


NUI?
NTLGOLD

ADD?
A21920100472


234219201004 72+COM

Welcome to Telecom Gold's System 72
 Please Sign On
>ID MAG 40113
Password: <??????>
TELECOM GOLD Automated Office Services 18.4T1(72)
On At 22:01 15/07/86 BST

       ********************
        M i c r o L i n k
       ********************                (c) Database Publications
        Welcome! You are
       now connected to the
        MicroLink mainframe
          at TELECOM GOLD

Type  MM  for the Microlink Menu        HELPLINE - 061 456 8836


>MM


BB .... Bulletin Board                  BR .... British Rail
EE .... Electronic Mail                 EG .... Exhibition Guide
FL .... FloraLink                       FP .... Free Pen Offer
GG .... Telecom Gold                    LL .... List of Bulletin Boards
MM .... MicroLink Menu                  MP .... Mail Plus - Easier to use
NB .... NewsBytes                       NL .... MicroLink Newsletter
NN .... MicroNews                       OL .... Order Link
RR .... Press Reviews                   PP .... MemoPad
SS .... MicroSearch                     TL .... TheatreLink
TM .... Telemessages                    TT .... Telex
UU .... User Guide                      WL .... WeatherLink
WW .... Who's Who in Microcomputing     XX .... TeleSoftware

Enter the letters of your choice        These can be used at any > prompt

>
```

Logging on to MicroLink

What MacTel offers

IT'S possible to connect several Macs to a hard disc. Think of MacTel as a hard disc in Nottingham – or anywhere – to which your Mac is connected through the telephone line. Just as is possible with ordinary networks of computers, it is possible to interchange programs and messages.

MacTel has two levels of access, Visitors and Subscribers. An individual subscriber pays £15 for six months and a firm £25.

As you would expect, although mail and goodies are available to visitors, the best of MacTel is reserved for subscribers. Apart from the subscription and the cost of the call, there is no other charge whatever.

Regular contact with MacTel ensures that you are kept in touch with the latest developments in Mac programs, and can download – that is, transfer a program from MacTel's hard disc to your Mac – any listed program you like.

Program doesn't just mean applications. It includes DAs, fonts, music applications, pictures, maps – anything, in fact, that can be used by your Mac. The latest MacTel files directory lists 43 separate headings!

The other principal Mac-related use is one of support and advice. MacTel callers include a wide range of Mac users, who between them have probably accumulated more experience of the machine than you'd think possible.

Any caller with a query related to the Mac may "post" it to a news section, where it will be read and potentially responded to by all subsequent callers.

Study of the news section provides a fascinating occupation. A new MacTel publication – ClipBoard – provides a useful compilation of news items from the board.

All in all, I feel that quite apart from the more usual reasons – connecting to huge databases, international electronic mail, even sending bunches of flowers – which can be put forward to justify the purchase, MacTel is itself sufficient reason for a Mac user to buy a modem.

Contact MacTel by setting your communications software to either 300/300 or 1200/75, 8 bits, no parity, and call MacTel HQ 0602 817696 or MacTel Sheffield 0742 350319.

If you need software, there is an official starter pack available, ring David Nicholson-Cole on 0602 810237 for details.

thought of asking Miracle Technology for help. After a false start, when they sent a lead with a normally-sized plug, they provided a suitable lead by return of post for a cost of only £20. It was well worth while.

The WS4000 is a small, flat box in a dull red shade, rather wider and deeper than a second disc drive but much shallower, although it sits comfortably under the second drive.

It comes with a separate transformer, a modem/telecom plug lead, a booklet listing several hundred BBS (**B**ulletin **B**oard**S**, similar to MacTel) and a thick but photocopied instruction manual.

Luckily, for the manual is dense and somewhat hard to follow, connecting the modem to my Mac was fairly straightforward.

The WS4000 comes with a separate transformer, so after turning everything off I plugged its transformer into the modem, the modem to the Mac, the telephone to the modem, the modem to the phone socket and finally the transformer to the mains. Phew.

I was expecting that I'd also have to buy an adaptor, to allow me to continue to use my telephone for ordinary calls, but happily the WS4000 has its own built-in BT socket. A telephone plugged into it may even be autodialled (for voice calls) by the Mac.

The WS4000 has only one button, out of sight on the back; this resets everything, in an emergency. I haven't had to use it, yet! On the front is a row of six red lights:

- Power on.
- Connected to an open telephone line.
- Carrier detect (have recognised another computer).
- Sending data (to another computer).
- Receiving data (from another computer).
- Autoanswer (awaiting a call from another computer).

After taking a few deep breaths I turned everything on and ran PGTerm, my communications program.

I set the number to dial, prefixed with ATD – which tells the modem **AT**tention **D**ial – and pulled down the Dial Number menu. The 4000 made a tiny clicking noise and a red light marked OL (on-line) came on and clickered as the number was dialled.

A pause, and suddenly on the Mac screen was "CONNECT", followed by the MacTel logo. It worked!

Although I was dealing with a Macintosh-specific bulletin board, what I found was very similar to ordinary boards. If you're used to an ordinary computer, it may all seem familiar.

To Mac types, the exchange of mouse for user-unfriendly instructions is a large step backwards! However, compared with say Telecom Gold, MacTel is wonderful.

After some delighted experimenting at the slower 300 baud speed, I tried 1200 baud access. Problems – I certainly gained text from the BBS at a much faster rate, but I also gained lots of garbage text, too. So I left a news item on MacTel, seeking advice.

The next time I called up, there were several helpful answers waiting for me. The one that worked was to set registers inside the modem with ATS (**AT**tention **S**et) to make the best 1200 setting. This was done simply by typing ATS18=10 and ATS26=10 from inside the terminal program before dialing a number.

After my enjoyable experiences with MacTel, I tried a large number of other BBS. The comprehensive list which comes with a WS4000 modem was useful here.

I was genuinely surprised at the huge numbers of boards around the country. With a Mac and WS4000 you should be able to log-on to over two hundred, although most of these may be fairly limited in scope.

I'd also joined MicroLink, through the special *Apple User* offer – this is about the cheapest way to gain access to Telecom Gold, incidentally. Here the access instructions are more cryptic, although the sky's the limit in terms of potential material to download.

In essence, once you have your modem connected it's possible to experiment with different boards until you are set up in a personalised system which exactly fits your needs. It's also possible to ring up a friend who has a modem and swop chat and programs by letting your Macs speak to each other.

There are many, many uses for a modem. But as a final personal example, I found that I could now use the modem to log on to my university computer from home – potentially saving me quite a lot of travelling time.

Overall, adding a modem to your Mac means a gateway to a whole new range of computer related experiences. For me, it has been a way into finding out new uses for my Mac, as well as gaining more from established ones.

For someone else, it could mean anything from a cheap way to access huge databases in America, to an easy way for Auntie to have a bunch of flowers on her birthday.

I would recommend the WS4000 as a very reasonably priced way for a Mac or Apple user to gain the ability to come on line. It's fun, too!

```
Main Menu
=========
I)nfo about MacTel   T)ime   O)ptions
M)ail
N)ews
F)iles
U)sers   V)iew Log
P)age - Call SYSOP   G)oing now,bye   ?) Help!

Command (I,T,O,M,N,F,U,V,P,G,?): F

File Menu
=========
D)isplay   S)elect   *)Choose   E)xit   ?) Help!
[Files] Command (D,S,*,E,?): 11
L)ist Files   D)ownload   U)pload   S)pace   E)xit   ?) Help!
[Files, Select] Command (L,D,U,S,E,?): L

************ File directory 11: Subscriber - Accessory/Fonts ***************
Name            Size Uploaded        Description
---Fonts and Font Stuff-----
Chicago14-24       17782 07/28/86   Get higher quality & more variety
Scan.font          15373 07/30/86   Scan Font
Paint.font          2304 06/15/86   MacPaintFont- hand,brush,pencil etc
Music.font         15648 06/15/86   Music Font - staves, notes etc
Picture.font       14428 06/15/86   Picture Font

The following are all LaserWriter Plus Fonts. They are the property of Apple
Computer, and are made available only for your private use,not for
redistribution.

NewCent.L+                    29878  07/02/86    New Century SchoolBook
Bookman.L+                    29896  07/02/86    Bookman Font
Avantgard.L+                  30784  07/02/86    Avant Garde
ZapfDingb.L+                  29998  07/02/86    Zapf Dingbats
ZapfChanc.L+                  25230  07/02/86    Zapf Chancery
Opti.Palat.Regenc.L+          39912  07/02/86    Optima, Palatino, Regency
NHelvetic.L+ 33972 07/02/86      Narrow Helvetica

[Files, Select] Command (L,D,U,S,E,?): D

Enter name of file to download: NewCent.L+

A)SCII      - Transfer the file as simple ASCII characters. Display on
              screen, and save to disc if required. Tap a key periodically
              to stop modem dropping line.
X)MODEM     - Transfer the file using the XMODEM protocol (your terminal
              program must support XMODEM to use this protocol).
M)ACBINARY - Transfer an Apple Macintosh file using the XMODEM protocol.
              MacBinary is a special protocol which handles the special
              format of Macintosh files, consisting of a resource and/or
              data "fork". MACINTOSH USERS ONLY!!

File Transfer Protocol? (A)scii, X)modem, M)acBinary): M
Starting MacBinary transfer, CTRL-X to abort.
```

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From elephants' ears to cannon balls, Science Toolkit has the answers

WHY do elephants have big ears? Why do you perspire on a hot summer's day? Does a cannon ball fall faster than a golf ball? What happens to starlight as it travels towards Earth? If you want to know the answers to these and many other questions on heat and light, Broderbund's Science Toolkit may be just the thing for you.

As the questions indicate, the Science Toolkit is aimed at youngsters who are interested in science. It should not be dismissed as just a toy – it can be used for monitoring the temperature of a room for up to 24 hours or for recording how many people pass through a doorway.

The kit consists of a temperature probe, a light probe, and an interface box which connects to the joystick port of an Apple IIe or IIc – an Apple II Plus needs an adaptor to connect the interface box to the joystick port. There is also a program disc and an excellent 128 page manual.

The interface box has four phono sockets. Two read digital (on/off) inputs, the others read analog (continuous) inputs. The thermistor and photocell probes connect to the analog sockets.

Both probes can be connected at the same time but the software allows you to read only one probe at a time. The interface box has a 33 inch lead and the probes have 45 inch leads but these could be extended with phonoplug connectors on longer leads.

The thermometer measures from −12° to 60° Celsius (10° to 140° Fahrenheit) and a safety alarm sounds automatically at 140°F.

The light meter measures from 0 to 500 foot candles. The software includes a timer which can be started and stopped either by pressing the spacebar or by using the two probes. It also features a strip chart to record data from either probe for continuous periods from 5 minutes to 24 hours.

The software offers good graphics, especially with a colour monitor. The thermometer is displayed like a room model with a red bar rising or falling with scales in Fahrenheit on one side and Celsius on the other side. At the same time, the screen shows digital readouts in Fahrenheit and Celsius. You can opt to set red and blue markers to record the maximum and minimum temperatures reached during an experiment.

The light meter is displayed as a panel with a histogram of coloured blocks that move and flash faster as the light increases. At the same time the screen shows a digital readout of the light intensity in foot candles. There is an optional sound output, a clicking noise which rises in pitch and rapidity as the light intensity increases.

The timer measures elapsed time from 0.01 seconds to 99 hours. The start/stop commands can be combined in various ways. For example, you could start it with the spacebar and stop it with the photocell. You can set the level of temperature or light that will start or stop the timer. Thus you could have it start when the temperature reaches 60°F and stop when a light goes on.

The timer shows a watch dial with a cycle of one minute and a single hand that moves once a second. There is also a digital readout in hours, minutes, seconds and hundredths of a second.

The strip chart looks like the top view of a continuous recording meter with a pen point that draws a line or a series of dots on a chart moving sideways. It records data gathered by one of the probes for periods of 5, 10, 15 or 30 minutes or 1, 4, 12 or 24 hours.

The chart records up to 4000 data points. The shorter the time period, the more frequently is the probe read and the data recorded. At its fastest the chart records more than 10 data points per second, at its slowest the chart records one data point every 20 seconds.

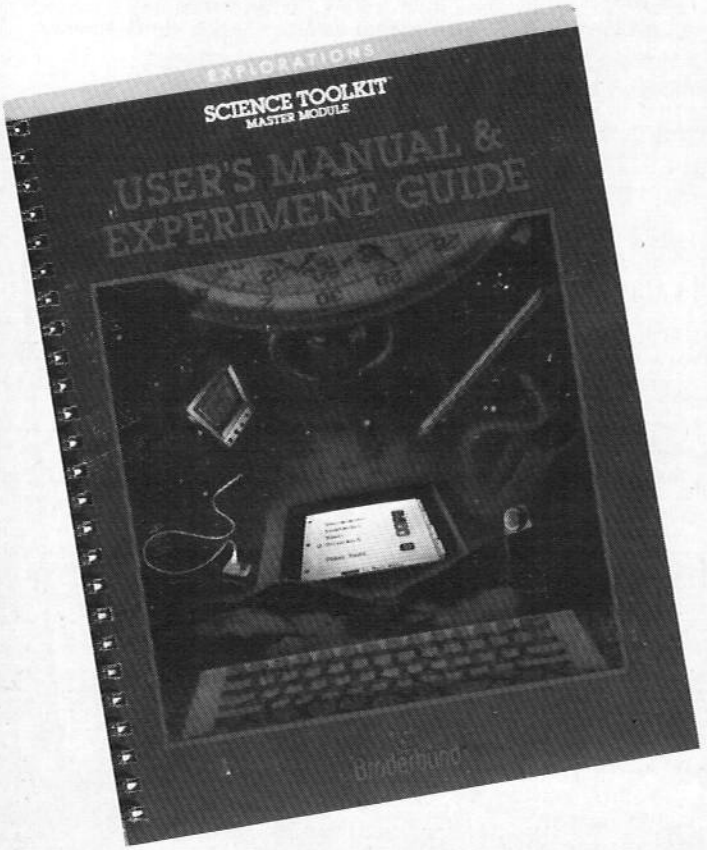
A scale along the top of the chart shows the proportion of the total time elapsed so far. A digital readout also shows the elapsed time. After recording you can review the data by moving the strip backwards or forwards. As you do so, the digital readout changes to show the elapsed time. Alternatively, you can review or print out the readings of the data points.

The screen displays 12 data points at a time, showing the number of the data point, the time and the reading in degrees or foot candles. Obviously, it takes a long time to review all the 4000 data points so you can opt to change the start point, the end point and, more important, the interval between the displayed readings.

For example, with a five minute recording, you could opt to start after 30 seconds, stop at 4 minutes and display every 20th reading. Similarly, you could save printing time and a great deal of paper by not printing out all the 4000 readings.

The data from the strip chart can be saved on a data disc which has been previously initalised from the main program. These are not Dos 3.3 or ProDOS discs so you must use the main program to catalog a disc. You can reload strip chart data saved from previous experiments and review or print out as you wish. You can also delete a file from the data disc.

One criticism of the Science Toolkit is that there is no backup copy of the master disc which is protected and cannot be duplicated with popular copying



programs. Oddly enough, the disc is not write protected so it would be possible to initialise this disc and wipe out the program. I would advise any purchaser to put a write protect tab on the master before using it.

You can calibrate the readings of the thermistor by putting the probe into cold water containing ice cubes then chainging the scale if necessary. I found that the probe read 31.5°F instead of 32°F. To adjust the scale for the photocell, you need a light meter to compare readings.

The manual describes about 30 simple experiments which can be carried out with little or no additional expense. For example, it suggests putting some warm water in different types of containers, such as a pie dish and a coffee cup, to compare the heat losses.

At a more advanced level it describes how the photocell can be used to measure the time for a ball to roll down a slope to check Galileo's findings.

The manual has ample warnings about safe use of the toolkit. It tells the user not to put the probes into the mouth, ears or nose, not to put anything into the sockets of the interface box except the probe connections, and not to put the probes into very hot water or solvents. If the warnings are followed, the kit seems safe for sensible youngsters.

The Science Toolkit has its limitations but it offers many hours of enjoyment and educational instruction to anyone interested in heat and light. At a price of almost £60 it may be beyond the disposable incomes of many British youngsters but it could be useful for schools or groups of enthusiasts. According to the manual add-on modules will soon be available. Presumably some will make use of the digital sockets of the interface box. **Geoff Wood**

Program: Science Toolkit.
Price: £49.99
Producer: Broderbund, c/o MGA Microsystems, 140 High Street, Tenterden, Kent TN30 6HT. Tel: 05806 4278.
Requirements: Apple IIc, IIe, II Plus.

Here's the train set you always wanted

SOME games aim to simulate a situation and others aim to test your reactions or wits, but the intent of the authors of MacInooga Choo-Choo was purely and simply for you to have fun.

This program is the train set you never had as a child – the one that came in the biggest box and had a seemingly unlimited supply of engines, rolling stock and scenery.

The mayhem starts when you boot up the disc to find that all the familiar desk-top icons have taken on a distinctly funicular look. All the items in the pull-down menu also show this strange metamorphosis.

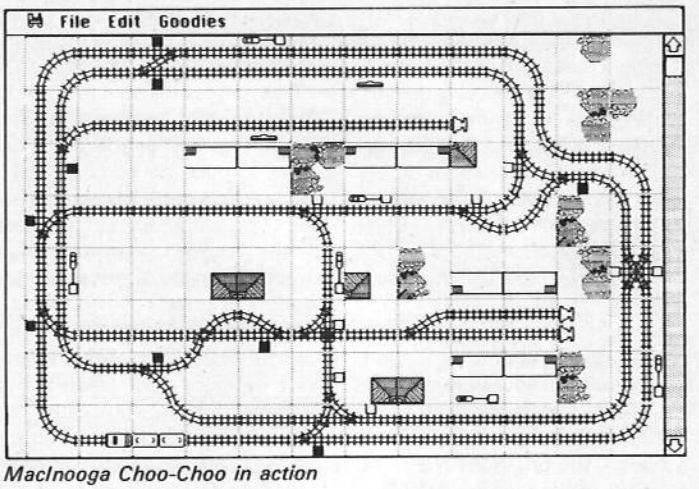
However, on to the program, where you can call up one of the sample layouts or start with a blank sheet. If starting afresh you will have a Track window containing 18 possible elements, each on its own tile. These range from bits of track to scenery and even control equipment.

Each tile may be rotated or inverted before being placed on the layout board. Many tiles can be superimposed on the same layout square to allow points, stations and complex layouts. Once placed the separate elements may also be manipulated.

Laying down the track is not as easy as you might think. Just like a real train set you only have a limited number of fixed radius curves to play with, and making them meet up at the end can be quite time consuming.

Just like the toy a lot of the satisfaction can be derived from simply constructing the layout and decorating it. There are three preformed pieces of scenery for you to use but the more artistic of you might like to use a MacPaint file as a backdrop to your track.

Having built your layout it is now time to run some trains. From the train menu you can drag as much stock as you like on to the layout. There are three different types of train, each with two types of rolling stock. You can put trucks in the siding for later collection, or assemble the whole train.



MacInooga Choo-Choo in action

Now choose Run Trains from the menu to remove the construction lines, then click on each train in turn to set them off. You can get them moving backwards by pressing Shift and clicking. This is where I have a slight quarrel with the authors of this program as I seem to disagree with them about which way is backwards. Nevertheless once in motion a further click will increase their speed or a shift click will stop them.

When the trains are travelling at half speed it is possible to track them with the mouse and stop them, but at full speed this is virtually impossible. The control equipment comes in very useful at this stage. The signal lights will stop a train as it draws adjacent to the signal and points can be switched to steer it on to another track. Buffers will only stop a half speed train.

The next best thing to running trains is crashing them and MacInooga Choo-Choo allows this also. You can run trains head-on or crash them in to scenery or the wreckage of previous crashes. Being computer generated your mangled wreckage can easily be repaired so that it's as good as new.

The advanced user may edit the given sections of track and controls but most layouts can be achieved with the sections given. The screen is scrollable so very large layouts can be made. It is even possible for the layout to wrap around the screen both horizontally and vertically.

Finally, there is a special tile marked Invisible. When a train enters this area it is oblivious to the laws of physics, cannot be seen and will not crash.

Despite the program being localised, when the documentation refers to the spacebar it actually means the key to the right of it. This had me foxed for some time. That and my previous comments about the direction of the trains are about the only quarrels I had with the program. In the main I found it to be great fun, very absorbing and, in the best tradition, totally pointless.

Mike Cook

Program: MacInooga Choo-Choo.
Publisher: Fortnum Software, c/o MacSerious Software, 36 Queen Street, Helensborgh G84 9PU. Tel: 0436 78131.
Price: £34.95
Requirements: 512k Macintosh.

Bawdy romp on Phobos

THE cheap liquor was taking its toll and I was compelled to answer the irrestible call of nature. Looking back, maybe I should have stayed in the Men's Room but then who would have saved Earth from the unspeakable habits of the Leather Goddesses of Phobos?

As it happened, no sooner had I adjusted my dress and stepped back into Joe's Bar than a bunch of Martians jumped me and whisked me off to Phobos, one of the moons of Mars. The Leather Goddesses, an alien race of neo-Amazon warriors, wanted a few human specimens to practice on before turning their naughty attentions to the rest of humanity. Their aim was to turn Earth into a sexual playground of their own making.

And so here I was again, caught up in yet another superb Infocom text adventure. LGOS is a delicious spoof of all those 1930 pulp science fiction stories – the ones with the lurid covers that usually depicted scantily clad females, bronze-muscled males and a seven-headed, multi-tentacled gargoyle, with a flying saucer or two thrown in for good measure.

LGOS was written by Steve Meretzky whose earlier Infocom adventures include among others the zany Planetfall and the co-authored Hitchhikers Guide to the Galaxy. Like those, LGOS is also very funny but this time the humour is aimed well and truly at adults.

With its tongue planted unerringly in its cheek, LCOS offers three levels of playing: tame (yawn), suggestive and lewd. The higher the level, the more risque the text. Bawdy it may be, but certainly no more so than you would expect of typical adults humour seen and heard on TV most nights of the week.

For example, if you're not careful, the giant venus fly-trap that devours you "secretes an enzyme which stimulates the pleasure centres of their victims. Hence, you experience multiple orgasms as your flesh is quickly dissolved away". What a way to go.

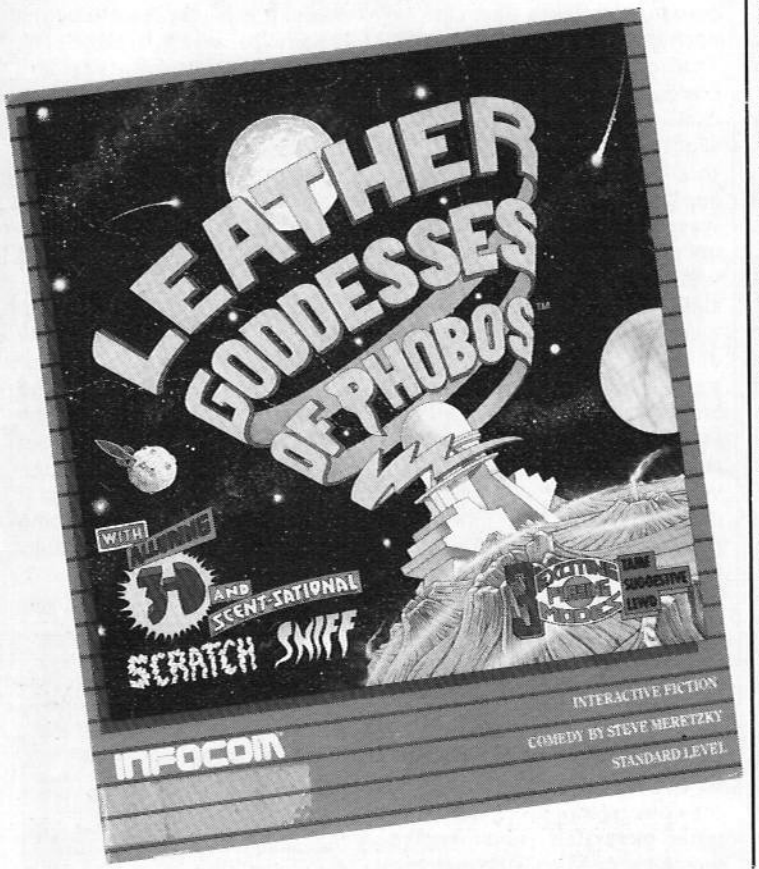
Once on Phobos, you may well escape the clutches of the aliens and meet up with a friend of the same sex. Together you can explore the planet by means of black circles which will transport you to different regions.

Your chief task is to collect certain components which, when assembled, will form a powerful weapon in your struggle – the super-duper, anti-leather goddesses attack machine!

You can play the game as a male or female – your gender is determined by which of the two lavatories you visit in Joe's Bar at the start of the game! The sex of at least one other participant in the adventure will depend on which sex you have chosen.

There are many moments of high comedy. What would you do with a frog wearing a crown? You're joking – kiss a repulsive creature with swollen eyes, oozing warts, slimy skin and a grating croak? I certainly wouldn't – and neither would the author. Giving this particular frog a smacker has all the hallmarks of the famous Babel fish problem from Hitchhikers – it even makes a passing reference to it, too!

Others include resisting the promptings of your bladder at the start of the game, peering into the aliens' Examination



World War III in Europe

BILLED as the "ultimate conflict simulation", Theatre Europe takes its players into World War Three. The player can take the role of supreme commander of either Nato forces or of the Warsaw Pact, controlling ground, air and nuclear units on a map stretching from Portugal to the Crimea, and from Finland to Yugoslavia.

Not only is this a strategy game with a selectable level of difficulty, it also includes graphic arcade sequences where guns and missiles can be tracked and fired. But unlike many arcade games you cannot just start playing and learning as you go along – the basic rules must be read from the outset.

The game covers the first 30 days of the conflict and the control of air and ground units is backed up by your ability to make strategic nuclear or chemical attacks. At the most basic level of the game you – as Nato commander – have to stop any further Russian expansion by preventing the occupation of West Germany.

The joystick controls a square cursor which, as it moves around the screen, gives information on the strength of units, terrain, cities, and so on. By placing this cursor over a Nato unit you can reposition your armies within a range limited by terrain type – moving units in the mountains takes two moves, for example. From here you can move on to the attack phase. Again using the cursor you decide which Warsaw Pact unit to attack. You cannot attack your own units, much as you may feel like it.

There is now the option to play the arcade part of the game, which gives some light relief. You select a particular battle and a view of the combat area is presented with enemy infantry, tanks and aircraft passing in front of your bunker. Depending on how many of the enemy are destroyed a bonus – or penalty – is applied to all your attacks.

After this there is a chance to rebuild combat strength, air strength and supply. You can assign the airforce to various missions and obtain comparison data on the enemy.

Finally, there is the option to carry out special missions. These can be rather drastic,

Room where another captive is being experimented on, and an encounter with a loony boffin ("you feel uneasy as the mad scientist locks the door behind you and dissolves the key in a vat of acid"). Just wait until you find out what he's got in mind for you.

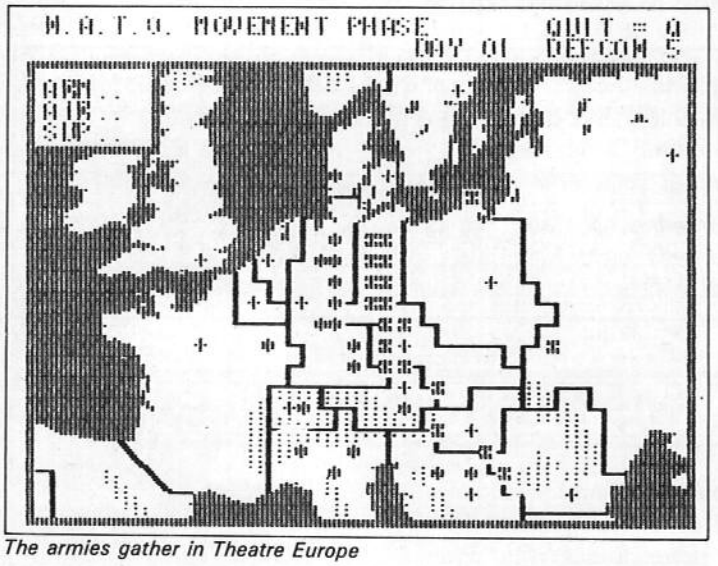
The ever-immaculate packaging includes a 3D comic with accompanying 3D glasses, and a scratch-and-sniff card. The game prompts you when to use the latter, so not only can you imagine the well-described scene but smell it as well.

I must confess to feeling not a little apprehensive when the program first told me to scratch and sniff the card – I was standing in the Gent's at the time! But I needn't have worried – it wasn't what I feared (thank goodness) but just the first of many moments of mischief that the program delights in.

The program is magnificent. I wouldn't have thought it possible for Infocom to surpass its own very high standards but it has done it with this one. Leather Goddesses is achingly funny and marvellously entertaining. Encore!

Bob Chappell

Program: Leather Goddesses of Phobos.
Price: £29.95.
Supplier: Infocom, c/o Activision, 23 Pond Street, Hampstead, London NW3 2PN. Tel: 01-431 1101.
Requirements: Apple II or Macintosh.



The armies gather in Theatre Europe

consisting of gas or chemical warheads, and single or multi-nuclear strikes. Once all this is completed the computer will take the turn of the enemy and go through all of the phases again.

This marks the end of day one, but it is by no means certain you will last the 30 days. Thankfully there is a facility to save the current game to disc.

Obviously a great deal of thought and research has gone into the game and it takes several sittings to appreciate its complexity. It is a strategy game with some of the elements of chess but with the added interest of graphic arcade sequences.

It requires skill and mental agility from the person who wants a serious but stimulating (or should that be simulating) game. The only drawback for me was that there is no simple way of telling how well or badly you are doing until the game is over. Perhaps real life commanders have the same problem.

As the writers say "all events in this conflict simulation are entirely fictitious. They must never be allowed to happen, the danger is that they might".

Let's hope the game is never played for real.

Bill Hammerton

Program: Theatre Europe.
Price: £19.95.
Publisher: PSS, 452 Stoney Stanton Road, Coventry CV6 5DG. Tel: 0203 667556.
Requirements: Apple II, with joystick or paddles.

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More on UltraTerm

By JAROMIR SMEJC

I WOULD like to make two points to follow on from my article in the August 1986 issue of *Apple User* about the location of the auxiliary slot in European Apples and the use of slot 3 dependent cards, particularly the UltraTerm.

First, there seems to be more and more software which will not work if the Ultraterm is in slot 3. This makes the addition of the previously described toggle switch a practical necessity rather than an optional luxury.

If you have an American Apple you can add this toggle switch in a slightly different way from that described in the August article. In place of a 2-pole Molex connector use a 3-pole one and wire its lowest contact to the second pole of the toggle switch.

This second pole is connected to finger 1 of the special low profile connector as described in the original article for the Euroapple IIe and shown there in Figure 1.

The Ultraterm card will now be inhibited when the toggle switch connects the middle and lower pins of jumper J1 and the 80 column extended memory card will be operative.

Flipping the switch to connect the upper and middle pins of jumper J1 will enable the Ultraterm and disable the 80 column card.

Second, there are some typographical errors and a few points in the published article which need to be cleared up.

Most importantly, on page 59 of that issue in the second column, third paragraph, the text should read "Correct numbers of contact fingers are 1 and 41".

Also, on page 60 from the second column onwards the text should read: "Both the lines to pin 1 (I/O SEL) and to pin 41 (DEV SEL) are important for modification and you will remove all other contact fingers from your low profile connector (LC) with the exception of the contact fingers for pins 1 and 41. The LC will now have only two live contact fingers. The finger for pin 1 is connected to the printed circuit track on the Ultraterm card as shown in Figure II".

On page 60, in the fourth column, fifth paragraph, the text should be: "Nothing is connected to the Ultraterm's contact finger 41 - it is now NC".

It may also be worth noting that CTRLP?NP in the third column of page 58 refers to Applewriter's old, familiar <CTRL>–P command which elicits the response ?NP.

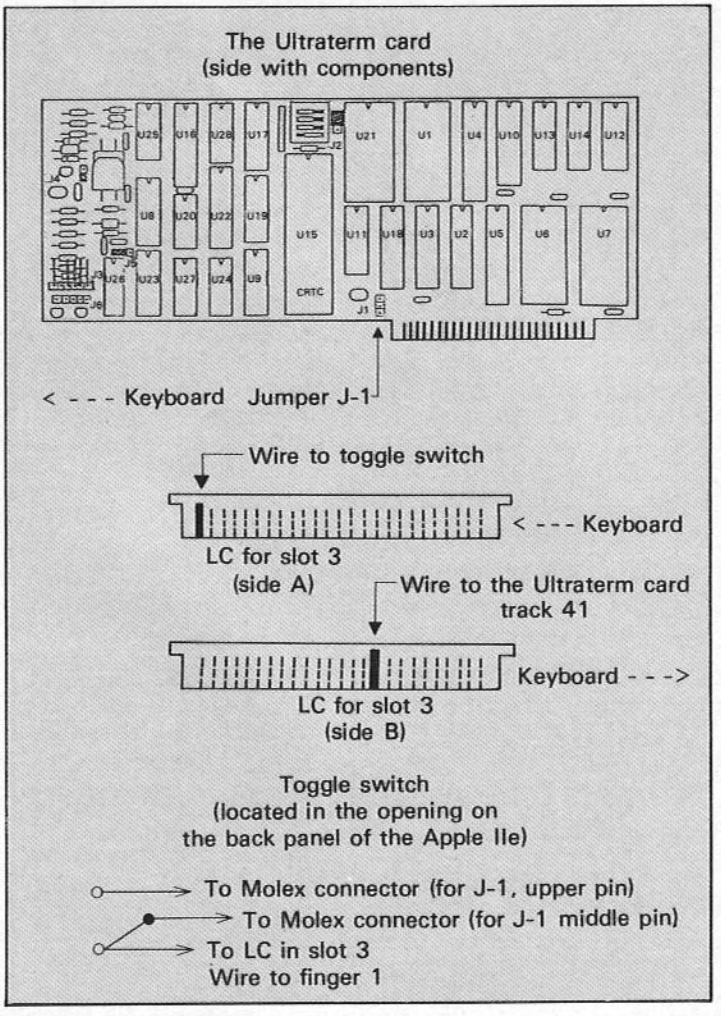

Figure I: UltraTerm reborn

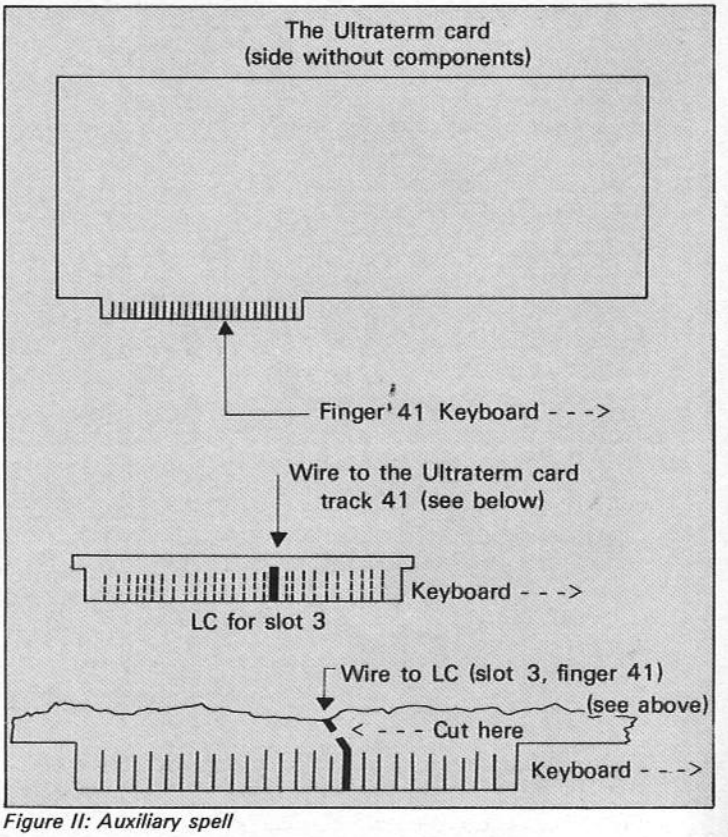

Figure II: Auxiliary spell

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Chrysanthemum

JIKANG ZHANG, G.N. OKEKE and C.H.B. MEE

introduce this flower creating plane curve

ONE of the most useful applications of the computer is its ability to plot a complex equation graphically. Many beautiful patterns can be drawn on an Apple using particular equations such as a rose curve, epicycloid or hypocycloid.

Here is a new plane curve, Chrysanthemum, which is very suitable for plotting these flowers on the screen.

For those who are interested – but you do not need to understand this to enter the program – the rose curve is expressed as follows in polar coordinates:

p=RsinNß or p=RcosNß

whereas the chrysanthemum curve can be written as:

p=(R – R1)sinNß+R1 or p=(R – R1)cosNß+R1

or in cartesian coordinates:

X = ((R – R1)sinNß + R1)cosß
Y = ((R – R1sinNß + R1)sinß
and
X = ((R-R1)cosNß + R1)cosß
Y = ((R – R1)cosNß + R1)sinß

where R is the amplitude of the curve (the radius).
R1 is a constant (a very important item).
N is a constant called shape number (another important parameter).
and ß is the angle.

Notice that the equation above will be an ordinary rose curve if R1=0. So the chrysanthemum curve is modified by adding an additional item into the rose curve equation.

To use high resolution graphics we let the angle increase in steps, calculate new values for X and Y from the equation of the curve, and HPLOT the new points.

In the BASIC program the equation of the chrysanthemum curve in the program is derived from X = ((R-R1)x sin(N x AR) + R1)x cos(AR + PHx PI/180) and Y = ((R – R1)x sin(N x AR) + R1)x sin(AR + PH x PI/180) where N is the shape number.
AR is the angle of the curve in radians.
PH is the initial phase of the curve in degrees.
PI = 3.1415926.
R and R1 are the amplitude and the constant respectively.

There are other parameters in the program:
S is the step of the angle in degrees.
A is the total angle in degrees.
F is the modified factor of the curve.
XC is the original coordinate of X.
YC is the original coordinate of Y.

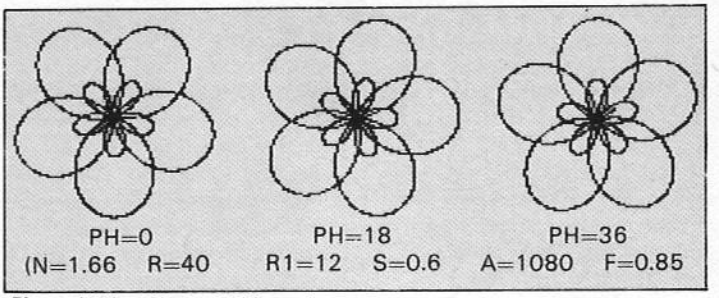


Figure I: The effect of PH on the curve

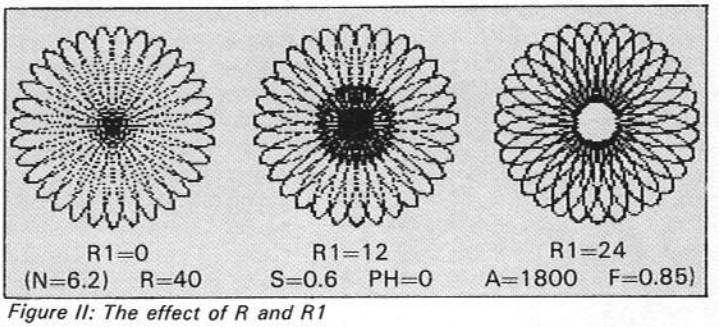


Figure II: The effect of R and R1

Lines 180 to 210 keep the curves on the screen and line 240 rings a bell to remind you that the curve is completed. The program's speed is heavily dependent on the parameters you choose, such as the shape number N, the step of the angle S and the total angle A. It can

```
10 PI = 3.1415926:P2 = PI / 180: TEXT
20 HGR : HCOLOR= 3
30 HOME : VTAB 21: INPUT "Enter Amplitude R = ";R
40 INPUT "Enter Constant R1 = ";R1
50 INPUT "Enter Angle Step S (0.5-1.5) ";S
60 INPUT "Enter Shape Number N (0.1-12) ";N
70 INPUT "Enter Total Angle A = ";A
80 INPUT "Enter Initial Phase PH = ";PH
90 INPUT "Enter Modified Factor F (0.6-1.5) ";F
100 INPUT "Enter Start Point for X ";XC
110 INPUT "Enter Start Point for Y ";YC
120 P3 = PH * P2:P4 = R - R1
130 FOR AD = 0 TO A STEP S
140 AR = AD * P2
150 Y = P4 * SIN (N * AR) + R1
160 X = Y * COS (AR + P4):Y = Y * SIN (AR + P4)
170 Y = - Y / F
180 IF X < - XC THEN X = - XC
190 IF X > 279 - XC THEN X = 279 - XC
200 IF Y < - YC THEN Y = - YC
210 IF Y > 179 - YC THEN Y = 179 - YC
220 HPLOT XC + X,YC + Y
230 NEXT
240 FOR J = 1 TO 3: PRINT : PRINT CHR$ (7): NEXT
250 PRINT "Do you want to print this? Y/N ";
260 GET G$: IF G$ < > "Y" AND G$ < > "y" THEN GOTO 300
270 PRINT : PRINT CHR$ (4)"PR#1"
280 PRINT : PRINT CHR$ (9)"GE"
290 PRINT : PRINT CHR$ (4)"PR#0"
300 PRINT : PRINT : PRINT : PRINT "Do you want to plot some more? Y/N ";
310 GET G$: IF G$ = "N" OR G$ = "n" THEN TEXT : HOME : END
320 PRINT : PRINT : PRINT : PRINT : PRINT "Do you want to keep the picture"
330 PRINT "on screen? Y/N ";
340 GET G$: IF G$ = "Y" OR G$ = "y" THEN GOTO 30
350 GOTO 20
```

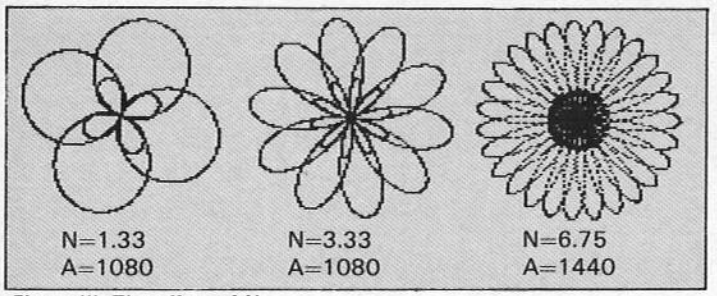


Figure III: The effect of N

vary from a few seconds to more than 10 minutes.

The initial phase PH

The curve is rotated with different PH, but remains symmetrical about multiple axes. For example, if N=1.66, R=40, R1=12, S=0.5 and A=1080 are chosen, the curve on the screen looks like a plum as shown in Figure I where PH is 0, 18 and 36 respectively.

Amplitude R and the constant R1

As mentioned previously, the chrysanthemum curve becomes a rose curve when R1 = 0. However if R1>0 an amazing curve we have never seen before is displayed on the screen as shown in the middle of Figure II.

The parameters chosen were R=40, R1=12, N=6.2, A=1800, S=0.5 and F=0.85. A shape similar to the outer part of the curve appears in the inner part if 0< R1< R/2. There will be a blank area in the centre of the flower if R/2< R1< R. As a particular case, the curve becomes a circle if R1=R.

The shape number N

This is a very important parameter of the curve. As shown in Figure III the shapes are very different from each other for their different Ns.

Each curve has its own number of petals. The number of petals will be P = N x A/360 (A is the total angle in degrees). Notice that P must be an integer number and N is a positive number (integer or fraction).

The total angle A

Only a part of the curve can be drawn if the total angle A is not big enough, as shown in Figure IV. On the other hand, time is wasted if the total angle A is bigger than the angle required for drawing a whole pattern.

The total angle for a chrysanthemum (R1>0) is just twice the total angle for a rose curve with the same shape number N.

The F factor (Figure V) allows for the variation in printer densities when screen dumping.

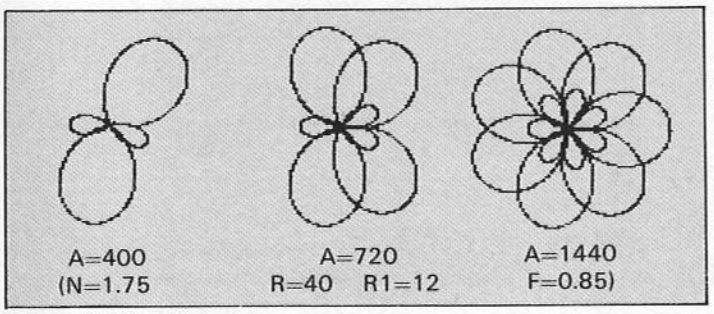


Figure IV: The effect of A

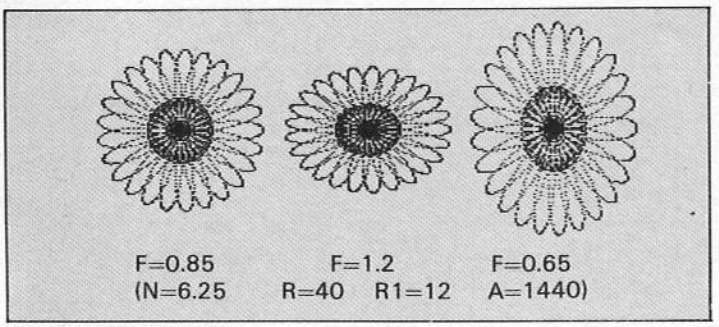


Figure V: The effect of F

MicroLink
in association with
TELECOM GOLD
NEWSLETTER

BIG TOP GOES ON-LINE

COMPUTER communications have transformed the business operations of Britain's biggest travelling circus.

MicroLink membership means that the American Circus – so called because of its three-ring, US style presentation – can utilise the very latest telex and electronic mail facilities.

But more importantly, a cellular radiolink to the public telephone system ensures that the "office" is no longer cut off from the outside world when the 30-waggon circus is travelling hundreds of miles between venues.

The computer and modem in the administrative trailer ensure that even when the show goes on the road there is constant communication with headquarters and with booking agencies in the town ahead.

"Using the Racal Vodata system and MicroLink we can do business just as efficiently as any permanently-based entertainment, like theatres for instance", says Ian Butson, administrative director of the circus.

"With 12 shows a week and up to 3,500 people at each under our Big Top, you can imagine what a difference PSS, telex and E-mail have made to running our operations.

"We are on the road from March to November and again over the Christmas/New Year season so you can see why I believe very strongly in the value of computer communications as a business resource".

Technology aids race relations

AS community relations officer for Hillingdon, the third largest London borough, Charan Rai has a big job on his hands.

His main function is to see that, in accordance with the Race Relations Act of 1976, there is no race or colour discrimination by employers in his area.

The size of his task can be seen from Hillingdon's 230,000 population and its concentration of large-scale employers such as Heathrow Airport – 50,000 work there – British Airways, Rank Xerox, EMI, Heinz and Express Dairies.

Fortunately, Indian-born Mr Rai has MicroLink's electronic mail and telex facilities to help keep him in touch with the many firms, union branches, central and local government departments he has to deal with.

Large numbers of the general public also come to him with questions.

Says Mr Rai: "Hillingdon has a large, racially diverse population living in an area that encompasses the extremes of run-down tower blocks and the stockbroker belt.

"But we have excellent community relations here, and we intend to keep things that way.

"We are greatly helped in this respect by our computerised case record system and by other new technology advances such as MicroLink".

Transatlantic link

MICROLINK has made history with the first ever interactive transatlantic computer hook-up.

With the aid of a communications satellite, MicroLink and giant American database Mnematics have set up a complex electronic gateway enabling the exchange of messages between micros in all parts of the US and UK.

It allows MicroLink subscribers not only to send messages to America, but also to take advantage of a vast array of services offered.

Stock market watchers can access instant information on share movements from Dow Jones, and there are over 40 sections for doctors, dentists; lawyers, writers and other special interest groups.

Leading news agency Associated Press supplies a 24-hour-a-day global information service.

Wildlife lifeline

THANKS to MicroLink, UK birdwatchers were able to follow the progress of a unique Japanese wildlife fund-raising event.

The 24-hour Birdathon was held to raise money to buy land for a breeding preserve for Japanese cranes.

Organisers hoped for five million yen through sponsorship of 16 teams who spent a full day and night scouring the Japanese countryside for different species of birds.

Taking part was MicroLink subscriber Yuichi Ishikawa. Armed with a mobile phone, acoustic coupler and portable micro, he was able to send regular reports to the MicroLink computer.

Phones' wasted weeks

A NEW survey by British Telecom has revealed that the average businessman wastes the equivalent of one week a year failing to communicate by telephone.

Statistics show that one in five messages left is either misinterpreted or lost, and four out of five calls find the number engaged or the other person unavailable.

As a result more and more business people are turning to electronic mail as a means of ensuring their messages reach their destinations – and the fastest growing of these systems in the UK is MicroLink.

According to the BT survey the average business person makes 2,500 calls a year, two-thirds of them to individuals who, for some reason, are unavailable at the time.

YOUR chance to join MicroLink – turn to Page 35

PINPOINT

ACCESSORIES, COMMUNICATIONS AND MUCH MORE

Stand-alone or integral with AppleWorks.

PinPoint provides desk-top accessories and communications which become an integral part of AppleWorks. A single key press gives you access to:
Communications
Calculator
Appointment diary/calendar
Notepad
Typewriter
QuickLabel
Graphics/Text Merging

PLUS: SPELLING CHECKER

PINPOINT provides communications with electronic mail/telex services such as One-to-One, Telecom Gold and EasyLink from within AppleWorks and is as easy to use as AppleWorks itself. It will directly transmit an AppleWorks Word Processor file. There is no text-file creation necessary, simply use the arrow keys to point to the file to transmit. Messages received are automatically saved as AppleWorks WP files. And all without quitting AppleWorks.

PINPOINT POP-UP SPELLING CHECKER

You can now Spell check within AppleWorks without leaving your document. There is no need to save, print or create a text file. One keypress selects PinPoint. A further single keypress selects the Spelling checker. You can check an entire document, just a paragraph or just a word, with a single keypress. You can even check the spelling of a word in a Spreadsheet cell or a DataBase field.

When a spelling is faulty the pop-up speller will suggest up to 10 alternatives for automatic correction or you can easily add the word to the dictionary. Or you can edit the word yourself.

The Spelling checker is an optional add-on to Pinpoint and is dedicated for AppleWorks.

Both PinPoint and the Spelling checker are particularly suited for use with extended memory peripherals such as RamWorks, Z-RAM and RamFactor . . .

MEMORY MANAGEMENT with Pinpoint RAM Enhancement Kit:

This is a utility program which gives much more flexibility and ease of use when using Ramdisks.

The RamFactor card can be automatically partitioned via its own on-board firmware. RamWorks and Z-RAM are usually used as a total memory area for expanded AppleWorks (or other single program such as Supercalc 3a) or a single RamDisk.

Using the PinPoint RAM Enhancement Kit enables RamWorks and Z-RAM to be easily partitioned into two areas: typically one area for expanded AppleWorks and the second area as a Ram-Disk containing often-used files. The RAM Enhancement Kit enables a startup disk to be created which will automatically load the required files into RAM on boot-up. A typical configuration would be for a 1 Meg RamWorks to have 700K available to Expanded AppleWorks and 320K designated as a Ram Disk. The Ram Disk has been set to auto-load the PinPoint accessories (including the spelling checker and its 50,000 word dictionary) plus two standard letter formats, and two spreadsheet templates. On boot-up, all these are automatically loaded into RAM, saving later disk access and giving fast loading into the AppleWorks desktop directly from the Ram disk. (AppleWorks recognises the Ramdisk directly).
PINPOINT requires a IIc or Enhanced IIe with at least 128k of RAM.

Prices: (excluding VAT)
PinPoint **£69.00**
PinPoint Pop-up Spelling Checker **£69.00**
PinPoint Ram Enhancement Kit **£29.00**
(included free with PinPoint to Z-RAM/RamWorks owners)
IIe Enhancement Kit (4 chips) **£59.00**

MULTISCRIBE

MultiScribe gives you MacWrite on the Apple IIe or IIc.

MultiScribe uses the double hi-res screen to provide multiple fonts, and sizes, proportional spacing and shadow and outline printing – just like MacWrite!

Plain Text
Bold
Italics
Underline
Shadow
Outline
Subscript

With MultiScribe you don't have to use a mouse. All functions and pull-down menus are easily accessed via the keyboard. Plus, as well as 10 fonts provided, there's even a font editor so you can create your own. All this on a full feature word processor.

MultiScribe works with a IIc or 128k IIe and most dot matrix printers and interface cards. You can even use MultiScribe to customise files created on other word processors such as AppleWorks or AppleWriter – in fact any word processor that can save text as a text file. Give your old files new life with the attractive, attention-getting fonts and print-styling available only with MultiScribe.
(MultiScribe can also save text as text files for transfer to other programs.)

For all its sophisticated features, MultiScribe is remarkably easy to learn and use. There are no complicated control codes to learn.
Macintosh-style pull-down menus provide you with all the word processor commands you'll ever need – without leaving your document. And MultiScribe feature advanced visually-oriented text editing commands, like cut & paste and ruler-based text formatting.

IF YOU'RE AFRAID OF MICE, DON'T WORRY

With MultiScribe you have the option of using a standard keyboard or a mouse. You can use your mouse to pick and click commands from the pull-down menus, or use the keyboard to simulate mouse action. And for advanced users, MultiScribe offers keyboard equivalents for most commands, allowing you to by-pass the pull-down menus.

With MultiScribe you can change type styles easily, on the screen and on your printouts. With a few simple keystrokes or mouse clicks, you can change that humdrum print into fancy fonts – like Old English, business quality print, foreign language characters or maths and engineering symbols. Ten fonts are included but if you don't like any of them, then you can create your own (or edit an existing font), with MultiScribe's FontEditor. For education the FontEditor can be used to create maths, physics, chemistry and biology fonts while for business use, the FontEditor can be used to create logos and letterheads.

MultiScribe can even be "Ram-Driven" with RamWorks, Z-RAM or RamFactor, and accelerated with TransWarp.

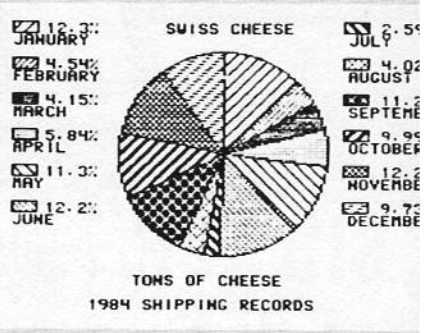
And all this for just £59.00.

No wonder Nibble magazine gave MultiScribe 5 apples – its highest rating.

Price: (excluding VAT)
MultiScribe **£59.00**

GRAPHWORK

GraphWorks is the graphics program for AppleWorks.



GraphWorks has been developed to offer business graphics capabilities for AppleWorks Users.
GraphWorks is a stand-alone program which directly accesses AppleWorks spreadsheet files and plots them as four graph types: bar, stacked-bar, line and pie charts.

Price: (excluding VAT)
GraphWorks ..... **£79.**

ProFILER 2.1

ProDos DataBase for Apple II computers

ProFiler 2.1 is a data manager/report generator which is intermediate in terms of power and ease of use between simple file systems such Quickfile/AppleWorks and complex, truly powe databases such as dBaseII and Omnis.

The structure of ProFiler is a flat-file system wi the ability to merge two files. It also provides a mail-merge facility with AppleWriter II, and wil accept database files from AppleWorks.

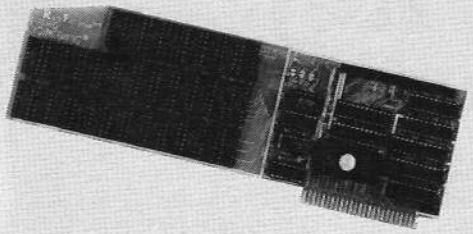
ProFiler 2.1 has been designed for ease of use is menu driven with help screens available at k points. It is programmed on a single floppy dis with hard disk transfer capabilities for increase storage and speed.

Key features are:
Maximum records per file: 64,000. (Subject available space on you disk (floppy or hard disk)).
Maximum pages per record: 8 (16 in 40 column mode).
Maximum fields per record: 250.
Index fields per record: 3.
Search: Maximum of 10 search criteria per record. (Browse and/or report).
Report: Free-Form or columnar. Calculated fields on columnar repo plus averages, counts and totals.
Mail-Merge: Witn AppleWriter II Version 2.0 (ProDos). (Use the Convert utility for Dos 3.3 version).
Import Data: Accepts AppleWorks' DataBase files directly. Will also accept text file input. (And can output as tex file).

Price: (excluding VAT)
ProFiler 2.1 ..... **£99.0**

RAMFACTOR

Compatible with IIe and II+



RAMFACTOR FOR APPLEWORKS ON THE II+

While RamWorks is the clear winner for the auxiliary slot of a IIe, Ramfactor sets the standard for IIe main slots and the II+.

Like RamWorks and Z-RAM, RamFactor follows the Apple software standard. Ramfactor also follows the Apple II Memory Expansion standard for Ram cards.
This permits the organisation of the memory into multiple work areas containing different programs and operating systems. It also permits limited expansion of AppleWorks 1.3 or later.

With RamFactor, you'll be able to instantly add another 256k, 512k or 1 Meg onto the main board of your IIe or II+.
And as it's socketed you can upgrade your RamFactor at any time.

Virtually all modern software is already automatically compatible with RamFactor: software such as AppleWorks, PinPoint, SuperCalc 3a, ProFiler, Catalyst 3.0 and more.

PROGRAM FLIPPING

RamFactor can be organised into a maximum of nine partitions. Each partition functions as a separate RamDisk which may be configured for either ProDos, Dos 3.3 or Pascal 1.3. This enables you to switch between programs and operating systems at electronic speeds.

APPLEWORKS POWER

RamFactor now includes software which enables AppleWorks to run on the II+.

So, with RamFactor you don't need any further software to run AppleWorks on your II+. And RamFactor expands AppleWorks as well:

RamFactor gives AppleWorks a larger desktop, increases AppleWorks' internal memory limits so that the Word Processor can have 5,300 lines, and the database 5,300 records. Plus it also automatically loads AppleWorks into RAM and so accelerates AppleWorks by eliminating program disk access. It will also auto-segment large files across 2 or more floppy disks. It even provides the time and date on the screen with virtually any ProDos compatible clock.

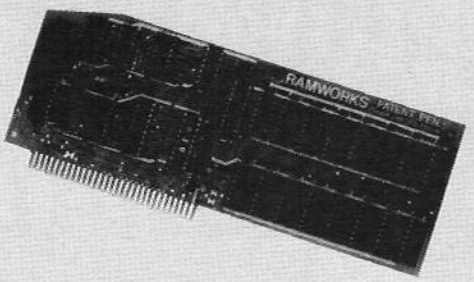
Unlike RamWorks, however, the AppleWorks must be version 1.3 or greater. And you still require an 80 column card (for the II+ we recommend ViewMaster). You also require a 16k language card in Slot 0 (or the TransWarp accelerator in slot 0).

Prices: (excluding VAT)

256k RamFactor	£239.00
512k RamFactor	£289.00
1 Meg RamFactor	£369.00

RAMWORKS

Compatible with IIe



RAMWORKS GOES UP TO 3 MEG

RAMWORKS is the sensational best selling memory card for the Apple IIe. Not only does RamWorks enhance and expand a vast array of other programs, it gives enhancements and expansion to AppleWorks that no other card can match or even come close.

No wonder people say: RamWorks for AppleWorks!

RamWorks plugs into the Apple IIe auxiliary slot and functions EXACTLY like Apple's extended 80 column card. But with RamWorks you get more memory, 80 column text, AppleWorks enhancements for ALL versions of AppleWorks, plus room to grow without using more slots. A design so advanced there's a patent on it.

Key features include:
(send for a more complete list of features, or see July or August issues of *Apple User*)

- Accelerates AppleWorks by eliminating disk access
- Increases AppleWorks Database to over 15,000 records
- Increases AppleWorks Word Processor to over 15,000 lines
- Increases AppleWorks Clipboard to 2000 lines or records
- Built-in AppleWorks printer buffer (for Super Serial Cards)
- Auto-segments large files so that files greater than disk capacity can be spread over two or more disks
- Expands ALL versions of AppleWorks – V1.0, V1.1, V1.2, V1.3 (and greater)
- Displays time and date on AppleWorks screen with any ProDos compatible clock
- Compatible with ALL IIe hardware (except Slot 3) including hard disks, Unidisk, Transwarp, Pro-App, modems etc, etc.

PLUS EVEN MORE MEMORY:

RamWorks is now RamWorks III. And that means all the above features plus increased memory above 1 Meg. 1.5 Meg RamWorks and 3 Meg RamWorks are now available:

Prices: (excluding VAT)

256k RamWorks	£219.00
512k RamWorks	£269.00
1 Meg RamWorks	£369.00
1.5 Meg RamWorks	£539.00
3 Meg RamWorks	£1299.00

HARD DISK FITS MACINTOSH PLUS APPLE IIE AND APPLE IIC

Finding a reliable and affordable hard disk for your Apple computer is now a whole lot easier with the arrival of the Pro-App 10 and 20 Megabyte hard-disk systems.

The new Pro-App hard disk is fully compatible with Apple IIe, Apple IIc and Macintosh Plus. (Macintosh 128 and 512 compatibility coming soon).

The Pro-App uses the latest hard-disk technology to improve the compatibility between Apples and Macs. Further, it uses Apple's own Unidisk controller to eliminate memory conflicts on the IIc and so provide a reliable hard-disc.

Interfaces and operating systems:

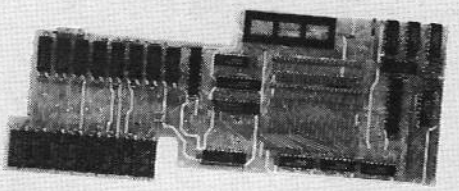
Macintosh Plus: High-speed SCSI interface.
Apple IIc: Connects to the external disk drive port on IIc. IIc MUST be Unidisk compatible. Operating systems: ProDos, Pascal 1.3 & Dos 3.3
Apple IIe: Connects to a Unidisk controller card. Operating systems: ProDos, Pascal 1.3 & Dos 3.3

The Pro-App follows the current Apple styling and is supplied with cables, manuals and software. (You may need a controller card for the IIe.)

Prices: (excluding VAT)
(Specify cable kit required/computer)

10Mb Hard Disc System	£795.00
20Mb Hard Disk System	£995.00
IIe UniDisk Controller Card	£49.00
IIc UniDisk Control Upgrade Chip	£19.00

THE 1 MEGABYTE IIC IS HERE WITH NEW Z-RAM II



Z-RAM is the supreme champion when it comes to expanding the IIc and making it more powerful. But now Z-RAM II is here, and that adds a whole EXTRA MEGABYTE to your IIc.

AppleWorks is expanded to a desktop size of 800k (that's nearly 16 times bigger than a standard IIc), PLUS you can run CP/M programs like dBase II and Wordstar.

Or you could have a half-Meg AppleWorks desktop, with a quarter-Meg RamDisk set aside to store accessories and communications such as PinPoint and its pop-up Speller, plus a 50,000 word dictionary plus a few files. And all this running at electronic speed on a IIc with no need for an external disk drive. (And there's a 64k (max) print buffer included for AppleWorks). Z-RAM is fully compatible with Pro-App Hard Disks.

You don't know how good a IIc is, until you've seen it with Z-RAM.

Z-RAM installs easily and securely inside the IIc in less than half an hour.
Installation is easy. Full, clear and precise instructions show you how and all you need is a screwdriver. (Absolutely no soldering).

For AppleWorks expansion – see details under RamWorks (or see July or August issues of *Apple User*).

Prices: (excluding VAT)

256k Z-RAM II (with CP/M)	£359.00
512k Z-RAM II (with CP/M)	£419.00
768k Z-RAM II (with CP/M)	£459.00
1 Meg Z-RAM II (with CP/M)	£599.00
640k IIc (IIc with 512k Z-RAM fitted)	£899.00
1152k IIc (IIc with 1 Meg Z-RAM fitted)	£1059.00

DESKTOP publishing is now a way of life with Apple.

In view of its importance, from next month *Apple User* will carry a regular section dealing exclusively with the latest developments.

We'll be taking a look at people currently using Apple DTP systems in different walks of life, reviewing new products as they come along and generally keeping up to date with this fascinating chapter in Apple's evolution.

If it concerns Desktop Publishing, you'll find it in *Apple User* from now on.

Take over where Caxton left off

MIKE COWLEY looks at the birth of a new printing revolution, and examines the technology that has brought about desktop publishing

IT'S not just the Eddie Shahs or the Rupert Murdochs of this world who are able to exploit the current publishing revolution.

Such is the new computer based technology that literally anyone with a micro and a laser printer can get in on the act.

And its impact is likely to be far greater than that of Caxton in Britain or Gutenberg in Germany combined.

For the first time it means that even the smallest firm can blend text and graphics to create reports, newsletters, manuals, brochures, fliers, price lists – in fact virtually anything previously farmed out to typesetting firms and graphics houses.

Users can even become instant editors of their own newspapers or magazines – even though the quality of the end product will still depend mainly on skills that have yet to be programmed into a micro.

While the current end product of computer controlled laser printers is still looked on with varying degrees of disdain by some specialist typographers, it is quite suitable for most applications.

In particular for companies it offers a level of control – from origination to finished product – previously the exclusive preserve of corporate giants like Boots who can afford to employ 485 people at its in-house printing facility.

Now, just so long as they have the creative personnel to run it, virtually anyone can publish and not necessarily be damned for it.

With external printing costs being as prohibitive as they are, it suddenly means that here is one of the few times that a market seems to be chasing the product.

And at the forefront of it all stands Apple, the supremo of desktop publishing thanks to the Macintosh and the LaserWriter.

In less than one year in the States, the company shot from nowhere to become the second largest supplier of typesetting devices and systems.

When the latest set of statistics – for 1986 – arrives, it is expected that Apple will have nudged the mighty Compugraphic, the world's number one supplier of printing plant, into second place.

Meanwhile back in the UK, Apple has already captured 70 per cent of the market which analysts reckon will be worth £300 million within two years.

It is this pot of gold situation which has resulted in formidable opposition in the shape of IBM and Rank Xerox beginning to raise their corporate heads.

As a result, Apple now has a real fight on its hands.

Yet officials, while not writing off the challenge presented by IBM – they would hardly be so foolish – believe they have a sufficient lead to give them a run for everybody's money.

Oddly enough, it wasn't even Apple who precipitated the rush into desktop publishing.

Hewlett Packard inadvertently set the scene back in 1984 with the release of the first inexpensive laser printer.

All HP had in mind at the time was a quiet, fast – if a bit expensive – successor to the daisywheel.

Apple was the first to appreciate that such a machine had considerable potential for publishing in the office world.

So the company picked up the ball and brought out the LaserWriter, the first printer to qualify as typesetting equipment and capable of producing eight pages a minute.

Where Hewlett Packard's

Cash MANAGEMENT News

No 16 February 1986

ICMS For Europe 16.1

US MAINFRAME/PC PACKAGE

In 1979 a software house in California introduced a cash and treasury management system, ICMS (Integrated Cash Management System), for large multinational corporations. This ran on large IBM mainframe computers. Since then 11 US corporations have bought the system including Daigety, Apple Computers, GTE and Valid Logic. Apple have benefitted from the system. ICMS claim, as they have grown from being a $60 million turnover/year company to $2.5 billion/year.

There are now two US companies using the system in Europe, Apple Computers and Valid Logic, both using it to run their international treasury operations. ICMS has a good reputation in the US, scoring highly in some of the recent reviews of treasury systems in the US.

The system is unusual in that it provides both a mainframe system and a PC version which can be used separately or can be integrated. ICMS is now being introduced into Europe.

The System

ICMS has 8 modules:

- communications manager
- international cash manager
- portfolio and debt manager
- accounting manager
- forecast manager
- foreign exchange manager
- bank relationship manager
- utilities module.

These are fully integrated, but can work independently where required.

Mainframe ICMS

The mainframe version of ICMS runs on large IBM mainframe computers using the VM/CMS and NOMAD operating systems. It can also be used on the Dun and Bradstreet timesharing system.

Most corporations are now buying both the mainframe and PC versions of ICMS and running them together. Of the 11 ICMS systems in operation four use the mainframe version only.

The cost of a full 7-8 module mainframe based ICMS is $112,000.

PC ICMS

The micro/PC version of ICMS has the same 8 modules. The PC version requires an IBM PC, XT or AT which has at least 512k of memory or a compatible. There is a version which works on the Apple IIe microcomputer specially developed for Apple themselves.

The Leahy Newsletter – a well respected specialist cash and treasury management newsletter in the US – gave the PC version of ICMS a '10.10' rating in its CTWS survey in November 1985.

ICMS in Europe

Initially only the PC version of ICMS is being introduced into Europe. The modules that are now available and their prices are as follows:

Module	$US
COMMUNICATIONS MANAGER	2,500
INTERNATIONAL CASH MANAGER	2,000
PORTFOLIO AND DEBT MANAGER	
Investments and Borrowings	3,500
Line Availability	500
ACCOUNTING MANAGER	3,000
Cash Ledger	500
Proof of Cash	
FOREIGN EXCHANGE MANAGER	3,000
(available Spring 1986)	
BANK RELATIONSHIP MANAGER	1,000
UTILITIES	1,000
Back-up and restore	500
Not Reported List	500
History File Access	750
Password and Access control	

The Forecast Manager module, available in the US from $3,000, is not going to be made available in Europe at this time.

ICMS will be sold direct to corporations and is also available for banks to license for selling to their customers.

Comment: The concept of an integrated PC and mainframe system is important and will be of interest to many European corporations. One of the vital determinants of its success will be how successfully this American system can be integrated with European banking and accounting practices and systems.

For more information *contact ICMS' European Sales Manager Robert J Conn at 112 Avenue Franklaind Roosevelt, 1050 Brussels, Belgium on +32-2-646 67 76 or their Sales and Marketing Director in California, USA Jeff Price on +1-415/583 3714.*

Contents

KwikBaL

BETTER THAN 30% SAVINGS

Control 750 16.2

Timesharing for electronic balance reporting and money transfer systems can be expensive particularly for small volume users. Cost is one of the main reasons many banks are looking at moving from timesharing to in-house systems. The reason for much of the expense is the large number of overhead (OH) transactions involved, viz for balance reporting:

- log-on (OH)
- ask for balance reporting (OH)
- ask for report type (OH)
- get data requested
- report data
- log-off (OH)

This overhead has to be carried for any number of accounts reported. There is also the overhead of the delays between transactions as users do not respond immediately.

Currently the whole process is lengthy resulting in long connect times and high telephone charges. The whole system is time consuming and

1

No. 16 February 1986

LaserJet had limited typographic appeal, Apple's machine produced typeset 'like' text, graphic output and even offered the facility to size type fonts.

It was the impact of the LaserWriter which was to create the desktop publishing market world wide.

With a resolution of 300 dots per inch (dpi), it is described as providing close to typeset quality. While this isn't strictly true – the fact is it offers less than half what the printing trade would accept – the customer would need to outlay an additional £20,000 plus to get anything better.

And even then it would take a trained eye to spot the real difference.

Described by chief executive John Scully as "the most powerful computing machine Apple manufactures" – it contains a 68000 processor – the LaserWriter marries the Macintosh to the Canon engine, the latter also to be found in the much cheaper LaserJet.

However, the LaserWriter offers far more graphic and typographic flexibility than its inferior cousin.

At the other end of the market can be found highly sophisticated machines. Allied Linotype offers a pair of Mac-driven typesetters – the Linotronic 100 and 300. With resolution up to 2540dpi, the top of the range 300 will not leave the purchaser with much change out of £50,000.

So for the moment at least, Apple dominates the middle ground with its LaserWriter based system. The fact of the matter is that no one around can offer anything better at a competitive price.

However, the company is well aware that with IBM openly drooling in the direction of desktop publishing, it must not be complacent.

That's why its research and development boffins have been burning the midnight oil in Cupertino to consolidate its position.

Last January saw the unveiling of the LaserWriter Plus, the first of what is likely to be a series of enhanced versions of the printer. (Rumour has it that they may already be working on a 600dpi model.)

The Plus factor for the new machine, apart from improved overall performance, lay in the fact that it added 22 type faces to the 13 already built in to the LaserWriter.

On the earlier model could be found: Times Roman, italic, bold and bold italic, Helvetica, Helvetica bold, Courier, Courier bold, and a symbol font. In all these produce 13 styles made up of these faces combined with the oblique versions of Helvetica and Courier.

With the Plus, the rom set adds 16 masters – ITC Avant Garde Book and Book Demi, ITC Bookman light, light italic, Demi and Demi italic, New Century Schoolbook italic, bold and bold italic, Palatino italic, bold and bold italic, ITC Zapf Chancery medium italic, and ITC Zapf Dingbats.

These produce 22 additional styles made up of the named faces plus oblique versions of Avant Garde and narrow versions of the Helvetica, Helvetica bold and Helvetica obliques.

And there is also a screen font disc that accompanies the LaserWriter Plus which includes a full set of screen fonts for all these faces.

All of this will be totally meaningless to the non purist. But all a purchaser needs to know is that combined they can present pages that look very much like those in commercially produced magazines – provided they are put together in the right way.

Large newspapers are already using the LaserWriter for graphics. USA Today was the first, with Eddie Shah's own Today breaking the ground in the UK.

In the States, a number of local papers have also dispensed with conventional typesetting equipment in favour of

VILLAGE VIEW 'APPLE' SUPPLEMENT

Apple System Chosen for Games Village Newspaper

More than 3,000 athletes and officials at this month's Commonwealth Games in Edinburgh will have their own daily eight-page tabloid newspaper, the "Village View", which is to be produced using Apple's unique Desktop Publishing system.

The "Village View" will run for two weeks and is a result of a joint project between Apple Computer (UK) Ltd, Edinburgh Apple dealer, McQueen Systems, and the Department of Print Media, Napier College, Edinburgh.

"We'll be trying to make it just like a normal morning newspaper, carrying everything from front-page news, horoscopes, weather reports, cartoons, and features," said Bill Allsopp, Lecturer in Journalism at Napier College, and editor of "Village View".

The rest of the editorial team comprises 13 first-year students from the College's Journalism course.

They will be split into two groups. A reporting team of eight students will work under Bill Allsopp filing copy from the Games Village. Another five trainees will make up the production group led by Print Lecturer Ron West, working from McQueen's Elliott House headquarters.

There the "Village View" pages will be electronically designed, using the Apple Macintosh LaserWriter and PageMaker software, before being despatched to The Scottish County Press printing plant at Bonnyrigg for printing - and delivery to the Games Village in time for breakfast.

'We couldn't have done it without an Apple a day'

- Editor

"We're trying to create a village atmosphere and we feel "Village View" will play an important part in moulding this feeling. It won't compete with the National Press sports coverage - rather it will be contain information and entertainment material very much within the context of the Games Village," said Village Executive Officer Robin Hastie-Smith.

There have been Commonwealth Games newspapers before. But "Village View" will be the first produced on Apple Desktop Publishing equipment.

"The most difficult problem we might face is that it will be the first time the students will have been exposed to real-world pressure," said McQueen's director Derek Gray. "Three people from McQueen's will be on hand in an advisory capacity. But, effectively, it is Napier's show. Technically, we know we can do it."

Good Luck message from David Hancock

Apple is delighted to be a part of a great international event which can show a positive side of this country to the rest of the world. We believe Apple is a very advanced company in terms of the applications and solutions it offers, especially in Desktop Publishing. With Apple products rapidly becoming accepted as the standard in Desktop Publishing, the production of "Village View" on an Apple system is an ideal opportunity to expose students of journalism to the latest technology in a real-world environment. We believe that from now on publishing is going to be different. For the first time in the history of printing, total control of the typesetting, design, and production process is back in the hands of the writers.

COMMONWEALTH GAMES SCOTLAND XIII VILLAGE VIEW 24th JULY - 2nd AUGUST

Some of the "Village View" team, lecturers Bill Allsopp and Ron West and Games Village Executive Officer Robin Hastie-Smith - the men who first dreamed up the idea of producing the Village newspaper by marrying electronic Desktop Publishing to traditional journalist skills.

Edinburgh Set for Biggest Games Ever

Four years' planning and £12.8 million have been spent on preparing for this year's Commonwealth Games, which will be the biggest since the Games were first held 56 years ago in Hamilton, New Zealand.

Nearly 3,000 athletes and officials from 59 countries, will occupy the Games Village from July 24 to August 2.

The Games Village itself has been converted from University residences. It will hold around 2,700 team members and be serviced by a 1,200-strong army of cleaners, caterers, and other service workers. Edinburgh is no stranger to the Commonwealth Games, having played host in 1970. But this is the first time the Games have been self-financed.

The £12.8 million needed to stage the Games has come from a variety of fund-raising events, as well as contributions from business and industry.

The Commonwealth Games newspaper, just one product of the new technology

'Apple has already captured 70 per cent of the market which analysts reckon will be worth £300 million within two years'

the Mac and the LaserWriter.

Even the Wilmington Town Crier, Compugraphic's home town newspaper, has joined the Apple camp.

However, those people contemplating going into production with "The Weekly Glassblower" or such like should bear in mind that it won't win any design awards if the person in charge has no basic knowledge of typography – computer or no computer.

Mind you, the Macintosh does offer considerable advantages over many other machines – particularly the IBM PC – when it comes to creative desktop publishing.

With its bit-mapped WYSIWYG (what you see is what you get) display and graphic user interface, the Macintosh could have been developed specifically for the task. In fact it wasn't but it has given the machine a new lease of life.

The Macintosh comes into its own as an illustrated document maker. It scores heavily over the PC in the fact that its central processor can handle images more readily, the screen has a higher resolution and allows the text to be displayed as printed. And for the moment at least it has superior software to its competitors.

Aldus Software's PageMaker, for one, has become the industry standard as a result of its tie up with the Macintosh.

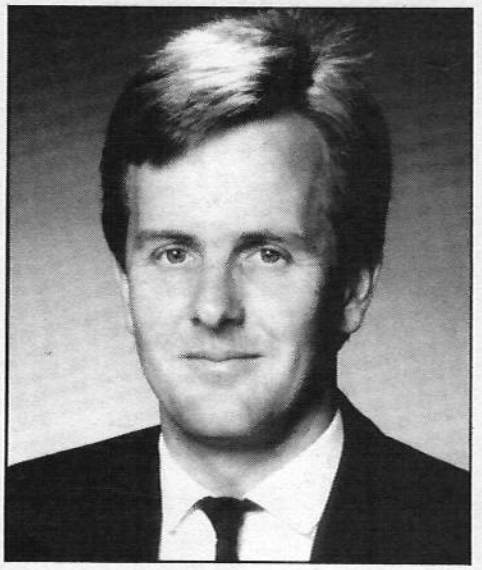
Using this package, pages can be drawn on screen with a mouse, with standard Macintosh word processing files filling the text. As elements are moved around, copy reflows automatically to reflect changes.

Although PageMaker is best known – it is now often used as the generic term for page composition software – the secret of Apple's success can be more easily identified with PostScript.

Apple came across this when they were looking for a powerful graphics language for the LaserWriter.

The main criterion required was that it would allow a large number of high resolution fonts to be stored in the printer. And that these should stay sharp no matter what the point size.

PostScript not only provides these answers but is also responsible for the speed at which LaserWriters can produce pages with mixed graphics and text.



David Jones: "We'll still remain ahead of the field".

It even allows for the altering of space between letters and condensed, justified, italic, rotated and reversed text.

With Apple just happening to own almost 20 per cent in Adobe, the company behind PostScript, it certainly gives them a feeling of added security in a market where IBM is breathing down its corporate neck.

For with PostScript the company believes it already has a grip on the market that even the corporate muscle of Big Blue will not force it to relinquish easily.

While Aldus has announced it is to release a PC version of PageMaker soon, Apple is well aware that its ace card lies in PostScript.

It is also taking consolation from what happened at the Seybold Conference in the States recently. For at this, the most prestigious event in the American printing calendar, more than 40 companies out of a total of 60 exhibiting desktop publishing products lined up on the side of the Apple system.

Similarly Apple UK is confident about continuing its current growth rate.

For they point to the fact that the current Apple Desktop System being marketed here at £8,400 would be several thousand pounds cheaper than anything comparable that can be offered by IBM.

"We currently have 70 per cent of the UK market in this field", says David Jones, Apple's DTP UK boss.

"And although we expect our share to go down eventually to around 40 per cent, we will still remain ahead of the field.

"Don't forget there are still a lot of would-be Eddie Shahs and Rupert Murdochs out there".

PS marks the start...

A STORY is usually ended with a postscript. But for Apple it was to mark the beginning.

In this case, the PostScript in question came from Adobe Systems "down the road" from the Apple headquarters in California.

Written specifically for the printing industry, it is now accepted as the standard in printer command languages.

Apple was so pleased with what it saw in PostScript that like that well known person in the electric shaver business, it made a bid for the company.

However, it was only able to acquire a 20 per cent stake because of monopoly law.

Nevertheless it found itself with a page description language which leads the world.

PostScript is a simple interpretive package, the primary application of which is to describe the appearance of text and graphics shapes, and sampled images on printed pages.

A program written in this language is used to communicate a description of a printable document from a composition system to a printing system.

The process of turning PostScript into an actual printed page is achieved in two stages – rasterization and marking.

Rasterization is the conversion of the input into an ordered series of dots.

This is necessary because the printing mechanism of a laser machine paints a page by sweeping the laser beam across a stacked set of horizontal lines that cross the page, working on the same principle as a dot matrix printer which moves the printer head to and fro across each line.

The sweep pattern or raster is fixed in order to bring the beam to each possible point on the page at a resolution of 300 dots an inch.

A built-in computer in the LaserWriter turns the beam on or off at each point in the pattern to create images.

Laser marking is the second stage, taking the dot images in raster order and turning them into black and white spots on the page.

The technology involved is very much like that of a photocopier.

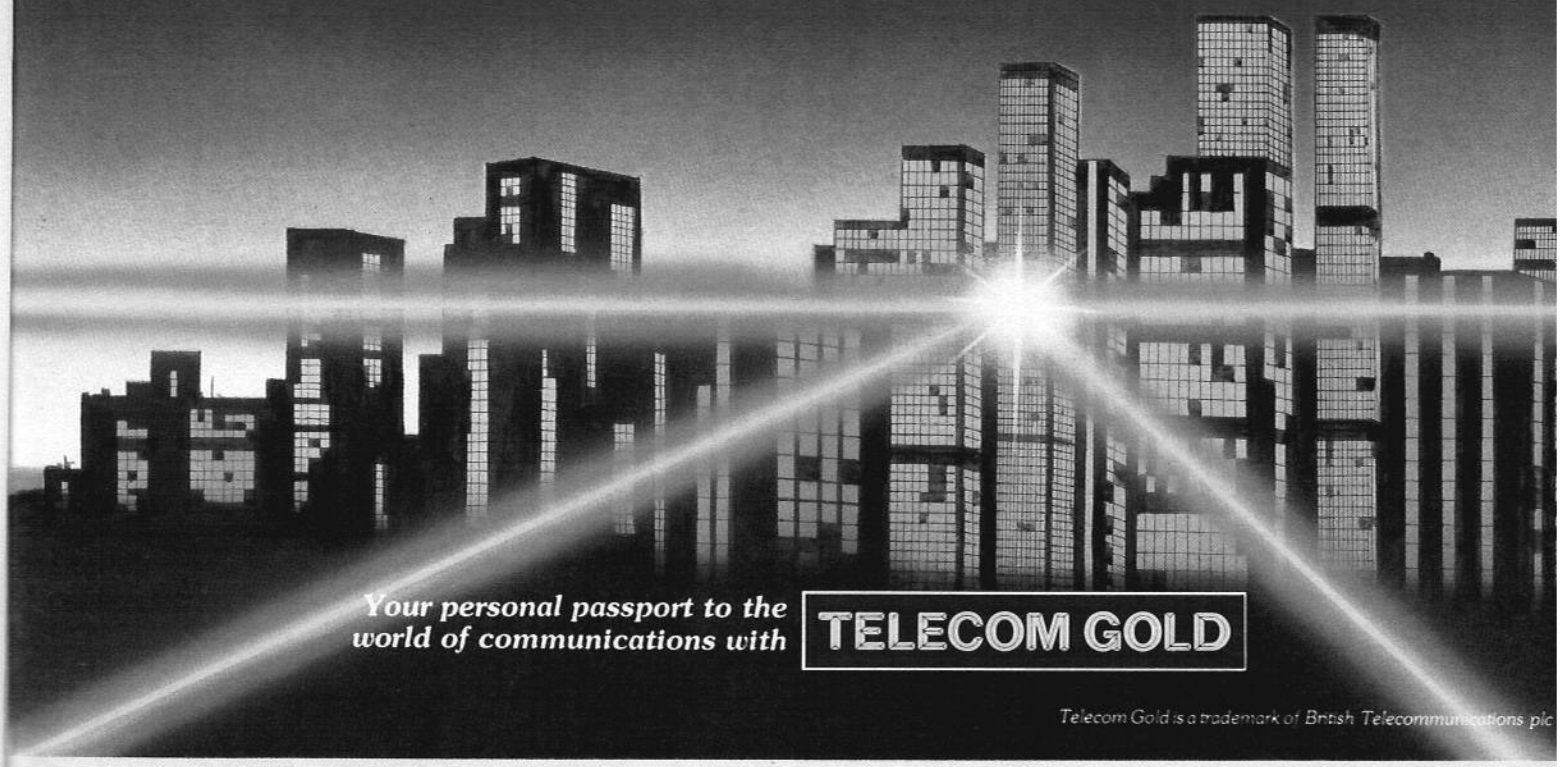
A light pattern caught on a photoconductive drum attracts toner that is then fused onto a piece of paper to create the image.

With a LaserWriter however, the optical image is not created by reflection of an already existing page but by the dot pattern the laser beam creates as it sweeps out the raster pattern.

"PostScript is as revolutionary as the laser printer itself", insists an Apple spokesman.

"It's a bit like discovering petrol after you've just invented the internal combustion engine".

MicroLink



Your personal passport to the world of communications with **TELECOM GOLD**

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 any 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.

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: No charge.

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.

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.

Telemessages: £1.45 for up to 350 words.
Telemessages can be sent with an illustrated greetings card for 75p 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.

MicroLink

in association with

TELECOM GOLD *

Application Form

I/We hereby apply to join MicroLink

(✓) □ I enclose my cheque for £5 payable to Database Publications as registration fee to MicroLink.

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

☑ I confirm that I am over 18 years of age.

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

I intend to use the following computer _____

Signature _____

Date _____

FOR OFFICE USE ONLY:

Mailbox assigned _____

Start date _____

Password _____

SEND TO: *AU11*
MicroLink
Database Publications
Europa House
68 Chester Road
Hazel Grove
Stockport SK7 5NY.

* *Telecom Gold is a trademark of British Telecommunications plc.*

Name

Position

Company

Address

Postcode

Daytime telephone

Commencement of Service
Please indicate month of commencement
Allow 10 days for validation of mailbox

□□ 19 □□

Payment
Whilst Database Publications Ltd is the supplier of all the services to you, the commission and billing thereof will be handled by Telecom Gold as agents for Database Publications Ltd.
Date of first payment to be on 15th of month following commencement.
Please complete billing authorisation form A, B or C below:

(✓) □ **A. Direct Debiting Mandate** *(Enter full postal address of Bank Branch)*

To

I/We authorise you until further notice in writing to charge to my/our account with you on or immediately after 15th day of each month unspecified amounts which may be debited thereto at the instance of British Telecommunications plc – TELECOM GOLD by Direct Debit. Bills are issued 10 days before debit is processed.

Name of Account to be debited

Account Number

(✓) □ **B. Please debit my/our Access/Visa/*American Express account number**
* *Overseas subscribers only*

I/We authorise you until further notice in writing to charge to my/our account with you on or immediately after 15th day of each month unspecified amounts which may be debited thereto at the instance of British Telecommunications plc – TELECOM GOLD. Bills are issued 10 days before charge is applied to your account.

(✓) □ **C. Please invoice the company/authority.**
If you select this option, which is ONLY AVAILABLE to government establishments and Public Limited Companies, we will require an OFFICIAL ORDER to accept unspecified amounts.

No hiding place for ProDOS files

Search them out and run them with Peter Ibbotson's handy program

THE trouble with hierarchical filing systems like ProDOS which are designed to cope with relatively large amounts of backup storage space is that it is all too easy to "lose" files in some directory or other.

Fortunately, ProDOS is designed to run the first system file which it finds on boot-up. Thus it is relatively easy to write and install a system program whose function is to search all drives and directories looking for other system files.

That is the function of the program listed here, which was created with Apple's ProDOS assembler.

By convention, a system program is loaded into memory from $2000 onwards as it is executed by a jump to this address. However a system program may relocate itself, as does BOOT.SYSTEM.

Whether you create your copy of this program with an assembler or directly via the monitor, the way to create a system file is to finally BSAVE it to disc (remember it has to be the first SYSTEM file after ProDOS) with the TSYS parameter suffix.

Probably then, the easiest way of creating this system file is to create it and BSAVE to disc with an assembler and then BLOAD it into memory at $2000.

Alternatively, create the program at $2000 with the monitor and BSAVE it to disc with the command:

BSAVE BOOT,A$2000,L$506

Remember that the first part of the code, here compiled at $700 but which actually runs at $2000, occupies $100 and the part which compiles to run at $800 is actually designed to be first loaded in at $2100. The first part loaded at $2000 then relocates this to $800 and executes it.

Now to create the system file itself BLOAD BOOT,A$2000, put the disc you want to boot in a drive and use the command:

BSAVE BOOT.SYSTEM, A$2000,L$506,TSYS

Make sure it is the first system file on the disc and that's it – boot with this disc and run any system file easily.

```
0000:                1 ********************
0000:                2 *  BOOT.SYSTEM     *
0000:                3 *  (C)OPYRIGHT     *
0000:                4 *       1986       *
0000:                5 * PETER IBBOTSON    *
0000:                6 ********************

0000:                7           LST   ON,NOASYM
0000:                8           MSB   ON
0000:                9           DSECT
0000:       0000    10           ORG   $0000
0000:       0002    11 FILECNT   DS    2          ;NO OF FILES
0002:       0002    12 ACTVENT   DS    2          ;NO OF ACTIVE ENTRIES
0004:       0002    13 ENTPTR    DS    2          ;POINTER FOR ENTRIES
0006:       0002    14 FILSTK    DS    2          ;POINTER FOR FILE STACK
0008:       0002    15 SYSSTK    DS    2          ;POINTER FOR SYSTEM STACK
000A:       0001    16 BLKENT    DS    1          ;ENTRIES FOR CURRENT BLOCK
000B:       0001    17 ENTLEN    DS    1          ;LENGTH OF EACH ENTRY
000C:       0001    18 ENTBLK    DS    1          ;No. OF ENTRIES PER BLOCK
000D:       0001    19 SYSFCNT   DS    1          ;SYSTEM FILE COUNT
000E:       0300    20 FILE      EQU   $300       ;USE UP A FREE PAGE
000E:       1B00    21 DBUFF     EQU   $1B00      ;DATA BUFFER
000E:       1C00    22 DBUFF1    EQU   $1C00      ;A.N.OTHER
000E:       4000    23 SYSSTACK  EQU   $4000      ;START OF SYSTEM STACK
000E:       BE00    24 FILSTACK  EQU   $BE00      ;START OF FILE STACK
000E:       BF00    25 MLI       EQU   $BF00      ;USEFUL ADDRESS
000E:       FDDA    26 PRBYTE    EQU   $FDDA      ;USED IN ERRORS
000E:       FDED    27 COUT      EQU   $FDED      ;OUTPUT ROUTINE
0000:               28           DEND
----- NEXT OBJECT FILE NAME IS /DEMO/BOOT.SYS.O
0700:       0700    29           ORG   $700        ;NOT REALLY HERE
0700:               30 *       BUT USED TO DUMMY
0700:A9 21          31           LDA   #$21        ;SO THAT MAIN PROGRAM
0702:85 01          32           STA   1           ;IS ORGanised TO $800
0704:A9 00          33           LDA   #$0         ;THIS SECTION COPIES
0706:85 00          34           STA   0           ;$1000 BYTES FROM
0708:85 02          35           STA   2           ;$2000 TO $0800
070A:A9 08          36           LDA   #$8         ;AND THEN RUNS IT
070C:85 03          37           STA   3
070E:A0 00          38 COPY      LDY   #$0         ;START POINT
0710:B1 00          39 COPY1     LDA   (0),Y       ;FROM HERE
0712:91 02          40           STA   (2),Y       ;TO THERE
0714:C8             41           INY               ;INCREMENT THE COUNT
0715:D0 F9   0710   42           BNE   COPY1       ;DONE 255 ?
0717:E6 01          43           INC   1           ;YEP,SO ADD ONE TO THE
0719:E6 03          44           INC   3           ;POINTERS
071B:A5 03          45           LDA   3           ;HAVE WE REACHED
071D:C9 18          46           CMP   #$18        ;$800+$1000 YET ?
071F:D0 ED   070E   47           BNE   COPY        ;NO, SO DO SOME MORE
0721:4C 00 08       48           JMP   $800        ;GO EXECUTE THE PROGRAM
0724:       00DC    49           DS    $800-*,0    ;SOME PADDING
0800:               50 *
0800:               51 * Now for the main part of the program
0800:               52 *
0800:20 7F 09       53           JSR   LINKSET     ;SET UP THOSE LINKS
0803:20 D5 08       54           JSR   ONLINE      ;WHICH VOLUMES ONLINE
0806:A5 06          55 NXTDIR    LDA   FILSTK      ;STACK EMPTY ?
0808:C9 00          56           CMP   #>FILSTACK  ;IF SO THEN GO
080A:D0 09   0815   57           BNE   NXTDIR1     ;AND DUMP FILE NAMES
080C:A5 07          58           LDA   FILSTK+1    ;TO THE SCREEN
080E:C9 BE          59           CMP   #<FILSTACK
0810:D0 03   0815   60           BNE   NXTDIR1     ;ELSE GO TO NEXT PIECE
0812:4C 7A 0A       61           JMP   DECISION    ;DUMP TO SCREEN
0815:20 1B 08       62 NXTDIR1   JSR   DISK        ;GO DO THIS DIRECTORY
0818:4C 06 08       63           JMP   NXTDIR      ;GO AND LOOP BACK
081B:               64 *
081B:               65 * This routine pulls a file off the stack
081B:               66 * reads in the directory, checks for:
081B:               67 * directory in which case it stacks the directory name
081B:               68 * System file in which case it stacks
081B:               69 *            it on the system stack
081B:               70 *
081B:20 51 09       71 DISK      JSR   GETDIR       ;GO GET THE DIRECTORY NAME
081E:20 A3 08       72           JSR   OPEN          ;OPEN IT UP
```

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0821:20 C1 08      73           JSR   READ          ;READ IN SOME DATA
0824:AD 23 1C      74           LDA   DBUFF1+$23    ;FIND OUT ENTRY LENGTH
0827:85 0B         75           STA   ENTLEN        ;SAVE IT
0829:AD 24 1C      76           LDA   DBUFF1+$24    ;FIND OUT HOW MANY
082C:85 0C         77           STA   ENTBLK        ;ENTRIES PER BLOCK
082E:AD 25 1C      78           LDA   DBUFF1+$25    ;THIS PAIR ARE
0831:85 00         79           STA   FILECNT       ;THE NUMBER OF FILES
0833:AD 26 1C      80           LDA   DBUFF1+$26    ;FOR THIS DIRECTORY
0836:85 01         81           STA   FILECNT+1
0838:18            82           CLC                 ;SET UP
0839:A9 04         83           LDA   #>DBUFF1+$04  ;THE ENTRY POINTER
083B:65 0B         84           ADC   ENTLEN        ;AFTER SKIPPING
083D:85 04         85           STA   ENTPTR        ;THE FIRST ENTRY
083F:A9 1C         86           LDA   #<DBUFF1+$04
0841:69 00         87           ADC   #$0
0843:85 05         88           STA   ENTPTR+1
0845:A9 02         89           LDA   #$02          ;PROCESS ENTRY 2
0847:85 0A         90           STA   BLKENT        ;SAY WHERE WE ARE
0849:A9 00         91           LDA   #$0           ;No. OF ACTIVE ENTRIES
084B:85 02         92           STA   ACTVENT       ;WE'VE FOUND
084D:85 03         93           STA   ACTVENT+1     ;EVERYTHINGS SET UP
084F:20 E5 09      94 WHILE     JSR   LESS          ;ACTIVE ENTRIES<FILE COUNT
0852:B0 06   085A  95           BCS   END           ;NO,THEN WE'VE ENDED
0854:20 AA 09      96           JSR   BEGIN         ;YEP THEN BEGIN THE LOOP
0857:4C 4F 08      97           JMP   WHILE         ;UNTIL FALSE
085A:20 71 09      98 END       JSR   CLOSE         ;FINISH THE JOB
085D:60            99           RTS                 ;AND GO BACK
085E:             100 *
085E:             101 * This is the error routine
085E:             102 * a bit primitive but there shouldn't
085E:             103 * be all that many
085E:             104 *
085E:48           105 ERROR    PHA                 ;SAVE THE CODE
085F:A2 00        106          LDX   #$0           ;LOAD UP A POINTER
0861:BD 6C 08     107 ERROR1   LDA   ERROR2,X      ;PRINT OUT THE MESSAGE
0864:F0 31   0897 108          BEQ   ERROR3        ;IF ITS ZERO THEN
0866:20 ED FD     109          JSR   COUT          ;WE'VE FINISHED
0869:E8           110          INX                 ;ELSE LOOP BACK
086A:D0 F5   0861 111          BNE   ERROR1
086C:8D 87        112 ERROR2   DB    $8D,$87
086E:C6 C1 D4 C1  113          ASC   'FATAL      ERROR (SEE SYSTEM '
0886:CD C1 CE D5  114          ASC   'MANUAL)    NUMBER $'
0896:00           115          DB    $00
0897:68           116 ERROR3   PLA                 ;COME BACK CODE ALL IS
0898:20 DA FD     117          JSR   PRBYTE        ;FORGIVEN
089B:A9 8D        118          LDA   #$8D          ;END THE MESSAGE
089D:20 ED FD     119          JSR   COUT          ;NEATLY
08A0:4C 65 FF     120          JMP   $FF65         ;AND DUMP INTO MONITOR
08A3:             121 *
08A3:             122 * Open up the file name
08A3:             123 *
08A3:20 B4 0B     124 OPEN     JSR   REHASH        ;DEAL WITH THE FILENAME
08A6:20 00 BF     125          JSR   MLI           ;GO AND OPEN UP THE FILE
08A9:C8           126          DB    $C8           ;OPEN UP THE FILE
08AA:B1 08        127          DW    OPEN2
08AC:F0 09   08B7 128          BEQ   OPEN3         ;ALL OK ?
08AE:4C 5E 08     129          JMP   ERROR         ;NO,SO TELL THE WORLD
08B1:03           130 OPEN2    DB    $03           ;DATA LIST
08B2:80 02        131          DW    $280
08B4:00 18        132          DW    DBUFF
08B6:00           133 REFNUM   DB    $00
08B7:AD B6 08     134 OPEN3    LDA   REFNUM        ;COPY THE REFERENCE NUMBER
08BA:8D CD 08     135          STA   RDRFNM        ;SO THAT OTHERS MAY USE IT
08BD:8D 7E 09     136          STA   CLRFNM
08C0:60           137          RTS
08C1:             138 *
08C1:             139 * read in 512 bytes from the directory
08C1:             140 *
08C1:20 00 BF     141 READ     JSR   MLI           ;LETS GO AND READ
08C4:CA           142          DB    $CA           ;IN 512 BYTES OF DATA
08C5:CC 08        143          DW    READ1
08C7:F0 0B   08D4 144          BEQ   READ2         ;DID WE HAVE AN ERROR
08C9:4C 5E 08     145          JMP   ERROR         ;PERHAPS . . .
08CC:04           146 READ1    DB    $4
08CD:00           147 RDRFNM   DB    $0
08CE:00 1C        148          DW    DBUFF1
08D0:00 02        149          DW    $200          ;1 BLOCK
08D2:00 00        150          DW    $000
08D4:60           151 READ2    RTS
08D5:             152 *
08D5:             153 * this routine stores onto a stack
08D5:             154 * the names of all online disks.
08D5:             155 *
08D5:20 00 BF     156 ONLINE   JSR   MLI           ;LETS FIND OUT WHO'S
08D8:C5           157          DB    $C5           ;AROUND
08D9:E0 08        158          DW    ONLINE1
08DB:F0 07   08E4 159          BEQ   ONLINE2       ;NO ERROR
08DD:4C 5E 08     160          JMP   ERROR
08E0:02           161 ONLINE1  DB    $02
08E1:00           162          DB    $00
08E2:00 18        163          DW    DBUFF
08E4:A9 00        164 ONLINE2  LDA   #>FILSTACK     ;SET UP THE STACK
08E6:85 06        165          STA   FILSTK        ;POINTERS
08E8:A9 BE        166          LDA   #<FILSTACK
08EA:85 07        167          STA   FILSTK+1
08EC:A9 00        168          LDA   #>DBUFF       ;SET UP SOME OTHERS
08EE:85 04        169          STA   ENTPTR
08F0:A9 18        170          LDA   #<DBUFF
08F2:85 05        171          STA   ENTPTR+1
08F4:A0 00        172 ONLINE3  LDY   #$00          ;NOW LETS COPY
08F6:B1 04        173          LDA   (ENTPTR),Y    ;THE DISK NAMES
08F8:D0 01   08FB 174          BNE   ONLINE4       ;TO THE FILE STACK
08FA:60           175          RTS                 ;END OF THE LIST
08FB:29 0F        176 ONLINE4  AND   #$0F          ;GET THE LENGTH
08FD:D0 0A   0909 177          BNE   ONLINE5       ;DO WE 'AVE AN ERROR
08FF:C8           178          INY                 ;YEP, WE DO.
0900:B1 04        179          LDA   (ENTPTR),Y    ;GO AND GET IT
0902:C9 57        180          CMP   #$57          ;IS IT DUPLICATE VOLUME
0904:D0 1C   0922 181          BNE   ONLINE7       ;NO,SO WHAT IS IT
0906:4C 5E 08     182          JMP   ERROR         ;KILL TIME
0909:C8           183 ONLINE5  INY                 ;NOW, WE REALLY DO SOME
090A:18           184          CLC                 ;SERIOUS BUSINESS
090B:69 01        185          ADC   #$1           ;ADD ONE FOR A SLASH
090D:8D 00 03     186          STA   FILE          ;SAVE IT FOR LATER
0910:A9 2F        187          LDA   #$2F          ;ADD 1 '/' TO THE
0912:8D 01 03     188          STA   FILE+1        ;START
0915:B1 04        189 ONLINE6  LDA   (ENTPTR),Y    ;AND COPY AWAY
0917:99 01 03     190          STA   FILE+1,Y
091A:C8           191          INY
091B:C0 11        192          CPY   #$11          ;DONE IT YET?
091D:D0 F6   0915 193          BNE   ONLINE6       ;NO SO COPY 1 MORE
091F:20 2C 09     194          JSR   STFDIR        ;SAVE NAME TO DIRECTORY
0922:A5 04        195 ONLINE7  LDA   ENTPTR         ;STACK AND SO ON TO THE
0924:18           196          CLC                 ;NEXT ENTRY
0925:69 10        197          ADC   #$10          ;WITH A SONG IN OUR HEARTS
0927:85 04        198          STA   ENTPTR
0929:4C F4 08     199          JMP   ONLINE3       ;AND LOOP BACK
092C:             200 *
092C:             201 * stick a directory name onto the stack
092C:             202 *
092C:EE 00 03     203 STFDIR   INC   FILE          ;ADD ONE TO THE COUNT
092F:38           204          SEC                 ;FOR THE COUNT BYTE
0930:A5 06        205          LDA   FILSTK        ;ALTER THE STACK POINTER
0932:ED 00 03     206          SBC   FILE
0935:85 06        207          STA   FILSTK
0937:B0 02   093B 208          BCS   STFDIR1
0939:C6 07        209          DEC   FILSTK+1
093B:AE 00 03     210 STFDIR1  LDX   FILE          ;FIND OUT HOW MUCH TO
093E:CA           211          DEX                 ;COPY AND START FROM
093F:8E 00 03     212          STX   FILE          ;THERE,CORRECT FILE
0942:A0 00        213          LDY   #$00          ;COUNT AND COPY AWAY
0944:8A           214          TXA
0945:91 06        215          STA   (FILSTK),Y
0947:C8           216 STFDIR2  INY                 ;NOW FOR THE TEXT
0948:B9 00 03     217          LDA   FILE,Y
094B:91 06        218          STA   (FILSTK),Y
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094D:CA          219          DEX              ;DONE THE WHOLE NAME YET?
094E:D0 F7  0947 220          BNE  STFDIR2     ;NO,SO CONTINUE ON
0950:60          221          RTS
0951:            222 *
0951:            223 * get a directory name back from the stack
0951:            224 *
0951:A0 00       225 GETDIR   LDY  #$00        ;THIS REVERSES THE PROCESS
0953:B1 06       226          LDA  (FILSTK),Y  ;AND BRINGS THE DIRECTORY
0955:8D 00 03    227          STA  FILE        ;NAME BACK
0958:AA          228          TAX
0959:C8          229 GETDIR1  INY
095A:B1 06       230          LDA  (FILSTK),Y
095C:99 00 03    231          STA  FILE,Y
095F:CA          232          DEX
0960:D0 F7  0959 233          BNE  GETDIR1
0962:AE 00 03    234          LDX  FILE
0965:E8          235          INX
0966:8A          236          TXA
0967:18          237          CLC
0968:65 06       238          ADC  FILSTK
096A:85 06       239          STA  FILSTK
096C:90 02  0970 240          BCC  GETDIR2
096E:E6 07       241          INC  FILSTK+1
0970:60          242 GETDIR2  RTS
0971:20 00 BF    243 CLOSE    JSR  MLI         ;HERE WE GO CLOSING
0974:CC          244          DB   $CC         ;DOWN THE FILES.
0975:7D 09       245          DW   CLOSE2
0977:F0 03  097C 246          BEQ  CLOSE1
0979:4C 5E 08    247          JMP  ERROR
097C:60          248 CLOSE1   RTS              ;NO ERROR
097D:01          249 CLOSE2   DB   $1
097E:00          250 CLRFNM   DB   $0
097F:            251 *
097F:            252 * This routine clears the filename stack
097F:            253 * and turns off the 80 column card
097F:            254 * resets the I/O hook to the standard
097F:            255 * pointers.
097F:            256 *
097F:A9 95       257 LINKSET  LDA  #$95        ;SET UP THE LINKS FOR
0981:20 ED FD    258          JSR  $FDED       ;LATER USE
0984:20 2F FB    259          JSR  $FB2F       ;TURN OFF ALL 80
0987:20 58 FC    260          JSR  $FC58       ;COLUMN CARDS
098A:A9 65       261          LDA  #$65        ;AND OTHER SUCH RUBBISH
098C:8D F2 03    262          STA  $3F2        ;SET THE RESET VECTOR TO
098F:A9 FF       263          LDA  #$FF        ;THE MONITOR
0991:8D F3 03    264          STA  $3F3
0994:20 6F FB    265          JSR  $FB6F
0997:20 93 FE    266          JSR  $FE93
099A:20 89 FE    267          JSR  $FE89
099D:A9 00       268          LDA  #$0         ;NOW WE HAVE GOT TO
099F:85 0D       269          STA  SYSFCNT     ;A STANDARD APPLE ][
09A1:A9 00       270          LDA  #>SYSSTACK  ;CONFIGERATION I SET
09A3:85 08       271          STA  SYSSTK      ;UP ALL MY OWN POINTERS
09A5:A9 40       272          LDA  #<SYSSTACK
09A7:85 09       273          STA  SYSSTK+1
09A9:60          274          RTS
09AA:            275 *
09AA:            276 * This routine goes through all the
09AA:            277 * entries in a directory saving all
09AA:            278 * new directories and system files.
09AA:            279 *
09AA:A0 00       280 BEGIN    LDY  #$00        ;NOW FOR SOME ACTION
09AC:B1 04       281          LDA  (ENTPTR),Y  ;ANY MORE FILES ACTIVE
09AE:F0 09  09B9 282          BEQ  NOACTV      ;NO SO DO NOTHING
09B0:20 EF 09    283          JSR  PROCESS     ;YES SO GO AND DEAL
09B3:E6 02       284          INC  ACTVENT     ;ADD ONE MORE TO THE COUNT
09B5:D0 02  09B9 285          BNE  NOACTV
09B7:E6 03       286          INC  ACTVENT+1
09B9:20 E5 09    287 NOACTV   JSR  LESS        ;HAVE WE REACHED THE
09BC:30 01  09BF 288          BMI  MORE        ;END OF DIRECTORY
09BE:60          289          RTS              ;YEP SO GO BACK
09BF:A5 0A       290 MORE     LDA  BLKENT      ;DO WE NEED TO READ SOME
09C1:C5 0C       291          CMP  ENTBLK      ;MORE IN FROM THE DISK
09C3:F0 10  09D5 292          BEQ  READMORE    ;GUESS WE DO ...
09C5:18          293          CLC
09C6:A5 04       294          LDA  ENTPTR      ;UPDATE THE POINTERS
09C8:65 0B       295          ADC  ENTLEN      ;FOR THE NEXT ENTRY
09CA:85 04       296          STA  ENTPTR
09CC:A5 05       297          LDA  ENTPTR+1
09CE:69 00       298          ADC  #$00
09D0:85 05       299          STA  ENTPTR+1
09D2:E6 0A       300          INC  BLKENT
09D4:60          301          RTS
09D5:            302 *
09D5:            303 * read in another block from a directory
09D5:            304 * and reset the pointers back to the
09D5:            305 * start
09D5:            306 *
09D5:20 C1 08    307 READMORE JSR  READ        ;READ 512 BYTES
09D8:A9 01       308          LDA  #$01        ;SAY WE ARE ON THE FIRST
09DA:85 0A       309          STA  BLKENT      ;ENTRY OF THIS BLOCK
09DC:A9 04       310          LDA  #>DBUFF1+4  ;AND SET UP THE POINTERS
09DE:85 04       311          STA  ENTPTR      ;FOR LATER USE.
09E0:A9 1C       312          LDA  #<DBUFF1+4
09E2:85 05       313          STA  ENTPTR+1
09E4:60          314          RTS
09E5:            315 *
09E5:            316 * This routine simply sets the flags for
09E5:            317 * NoOfActiveEntries - FileCount
09E5:            318 *
09E5:38          319 LESS     SEC
09E6:A5 02       320          LDA  ACTVENT
09E8:E5 00       321          SBC  FILECNT
09EA:A5 03       322          LDA  ACTVENT+1
09EC:E5 01       323          SBC  FILECNT+1
09EE:60          324          RTS
09EF:            325 *
09EF:            326 * This routine processes one entry
09EF:            327 * from the directory
09EF:            328 *
09EF:            329 * You could make modifications to list
09EF:            330 * out all the files on a disk
09EF:            331 *
09EF:A0 10       332 PROCESS  LDY  #$10        ;What type of file do we
09F1:B1 04       333          LDA  (ENTPTR),Y  ;have
09F3:C9 0F       334          CMP  #$0F        ;is it a directory?
09F5:D0 2E  0A25 335          BNE  PRINT       ;no so go else where
09F7:AD 00 03    336          LDA  FILE        ;we got one!
09FA:48          337          PHA              ;add the name on to
09FB:A0 00       338          LDY  #$0         ;the old one (Prefix)
09FD:B1 04       339          LDA  (ENTPTR),Y  ;how long is the name
09FF:29 0F       340          AND  #$0F
0A01:18          341          CLC              ;add it on to the old
0A02:69 01       342          ADC  #$1         ;+1 for the /
0A04:6D 00 03    343          ADC  FILE        ;save it as the new
0A07:8D 00 03    344          STA  FILE        ;length
0A0A:68          345          PLA              ;now where do we start?
0A0B:AA          346          TAX              ;tell the x-reg
0A0C:48          347          PHA              ;but keep a copy
0A0D:A9 2F       348          LDA  #$2F        ;add a slash to the end
0A0F:9D 01 03    349          STA  FILE+1,X    ;of the old name
0A12:C8          350 DIRECT   INY              ;and copy it over.
0A13:E8          351          INX
0A14:B1 04       352          LDA  (ENTPTR),Y  ;not very difficult
0A16:9D 01 03    353          STA  FILE+1,X
0A19:C0 10       354          CPY  #$10        ;end yet?
0A1B:D0 F5  0A12 355          BNE  DIRECT      ;no.
0A1D:20 2C 09    356          JSR  STFDIR      ;yep so go and stuff
0A20:68          357          PLA              ;onto the stack
0A21:8D 00 03    358          STA  FILE        ;reset file name back
0A24:60          359          RTS              ;to its old level
0A25:            360 *
0A25:            361 * this routine could print out the file
0A25:            362 * name and so form a comprehensive listing program
0A25:            363 *
0A25:C9 FF       364 PRINT    CMP  #$FF        ;IS IT A SYSTEM FILE
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0A27:F0 01   0A2A  365          BEQ   SYSTEM
0A29:60            366          RTS                  ;NO SO RETURN BACK
0A2A:E6 0D         367 SYSTEM   INC   SYSFCNT        ;ADD ONE TO FILE COUNT
0A2C:A0 00         368          LDY   #$0            ;And add the file
0A2E:B1 04         369          LDA   (ENTPTR),Y     ;file name including
0A30:29 0F         370          AND   #$0F           ;prefix to the system
0A32:18            371          CLC                  ;stack
0A33:6D 00 03      372          ADC   FILE
0A36:69 01         373          ADC   #$01
0A38:91 08         374          STA   (SYSSTK),Y
0A3A:C8            375          INY
0A3B:AE 00 03      376          LDX   FILE
0A3E:B9 00 03      377 SYS1     LDA   FILE,Y
0A41:91 08         378          STA   (SYSSTK),Y
0A43:C8            379          INY
0A44:CA            380          DEX
0A45:D0 F7   0A3E  381          BNE   SYS1
0A47:AC 00 03      382          LDY   FILE
0A4A:C8            383          INY
0A4B:A9 2F         384          LDA   #$2F
0A4D:91 08         385          STA   (SYSSTK),Y
0A4F:98            386          TYA
0A50:18            387          CLC
0A51:65 08         388          ADC   SYSSTK
0A53:85 08         389          STA   SYSSTK
0A55:A5 09         390          LDA   SYSSTK+1
0A57:69 00         391          ADC   #$00
0A59:85 09         392          STA   SYSSTK+1
0A5B:A0 01         393          LDY   #$01
0A5D:B1 04         394 SYS2     LDA   (ENTPTR),Y
0A5F:91 08         395          STA   (SYSSTK),Y
0A61:C8            396          INY
0A62:C0 10         397          CPY   #$10
0A64:D0 F7   0A5D  398          BNE   SYS2
0A66:A0 00         399          LDY   #$0
0A68:B1 04         400          LDA   (ENTPTR),Y
0A6A:29 0F         401          AND   #$0F
0A6C:18            402          CLC
0A6D:69 01         403          ADC   #$1
0A6F:65 08         404          ADC   SYSSTK
0A71:85 08         405          STA   SYSSTK
0A73:A5 09         406          LDA   SYSSTK+1
0A75:69 00         407          ADC   #$00
0A77:85 09         408          STA   SYSSTK+1
0A79:60            409          RTS
0A7A:              410 *
0A7A:              411 * now we list out the file names
0A7A:              412 * and ask the user to pick one
0A7A:              413 *
0A7A:A9 00         414 DECISION LDA   #)SYSSTACK     ;start at the beginning
0A7C:85 08         415          STA   SYSSTK
0A7E:A9 40         416          LDA   #(SYSSTACK
0A80:85 09         417          STA   SYSSTK+1
0A82:A9 00         418          LDA   #$00
0A84:85 0C         419          STA   ENTBLK
0A86:E6 0C         420 NEXT     INC   ENTBLK         ;add one to the count
0A88:A5 0C         421          LDA   ENTBLK         ;now add 'A'
0A8A:18            422          CLC
0A8B:69 C0         423          ADC   #$C0           ;to give the choice a
0A8D:20 ED FD      424          JSR   COUT           ;letter
0A90:A9 A9         425          LDA   #')
0A92:20 ED FD      426          JSR   COUT           ;print out x)
0A95:A9 A0         427          LDA   #$A0
0A97:20 ED FD      428          JSR   COUT           ;plus a space
0A9A:A0 00         429          LDY   #$00
0A9C:B1 08         430          LDA   (SYSSTK),Y     ;how long is it?
0A9E:AA            431          TAX
0A9F:C8            432 NEXT1    INY                  ;get the next character
0AA0:B1 0B         433          LDA   (SYSSTK),Y
0AA2:09 80         434          ORA   #$80           ;make it acceptable to
0AA4:20 ED FD      435          JSR   COUT           ;cout
0AA7:CA            436          DEX                  ;end of this name yet?
0AA8:D0 F5   0A9F  437          BNE   NEXT1
0AAA:A9 8D         438          LDA   #$8D           ;yep so go to the next
0AAC:20 ED FD      439          JSR   COUT           ;line down
0AAF:98            440          TYA                  ;now we update the
0AB0:18            441          CLC                  ;pointer to the next
0AB1:69 01         442          ADC   #$01           ;name
0AB3:65 08         443          ADC   SYSSTK
0AB5:85 08         444          STA   SYSSTK
0AB7:A5 09         445          LDA   SYSSTK+1
0AB9:69 00         446          ADC   #$00
0ABB:85 09         447          STA   SYSSTK+1
0ABD:A5 0C         448          LDA   ENTBLK         ;have we listed out
0ABF:C5 0D         449          CMP   SYSFCNT        ;all the files?
0AC1:D0 C3   0A86  450          BNE   NEXT
0AC3:A0 00         451          LDY   #$00           ;now we ask a question
0AC5:B9 D0 0A      452 NEXT2    LDA   MSG,Y
0AC8:F0 1D   0AE7  453          BEQ   NEXT3
0ACA:20 ED FD      454          JSR   $FDED
0ACD:C8            455          INY
0ACE:D0 F5   0AC5  456          BNE   NEXT2
0AD0:8D BD         457 MSG      DB    $8D,$BD
0AD2:D4 D9 D0 C5   458          ASC   'TYPE          YOUR CHOICE (A-'
0AE6:00            459          DB    $00
0AE7:18            460 NEXT3    CLC                  ;now for the last letter
0AE8:A5 0D         461          LDA   SYSFCNT
0AEA:69 C0         462          ADC   #$C0
0AEC:20 ED FD      463          JSR   $FDED
0AEF:A9 A9         464          LDA   #')            ;print out
0AF1:20 ED FD      465          JSR   $FDED          ; x)
0AF4:20 0C FD      466 KEY      JSR   $FD0C          ;go and get some input
0AF7:38            467          SEC                  ;subtract the
0AF8:E9 C0         468          SBC   #$C0           ;offset
0AFA:F0 F8   0AF4  469          BEQ   KEY            ;has '@' been pressed?
0AFC:C5 0D         470          CMP   SYSFCNT        ;more than we have to
0AFE:F0 02   0B02  471          BEQ   NEXT4          ;offer?
0B00:B0 F2   0AF4  472          BCS   KEY            ;yep so try again
0B02:85 0A         473 NEXT4    STA   BLKENT         ;save it away
0B04:A9 00         474          LDA   #)SYSSTACK     ;now count through
0B06:85 0B         475          STA   SYSSTK         ;the files available
0B08:A9 40         476          LDA   #(SYSSTACK
0B0A:85 09         477          STA   SYSSTK+1
0B0C:A9 01         478          LDA   #$01
0B0E:85 0C         479          STA   ENTBLK
0B10:A5 0C         480 NEXT5    LDA   ENTBLK
0B12:C5 0A         481          CMP   BLKENT
0B14:F0 11   0B27  482          BEQ   FOUND          ;until we reach the
0B16:E6 0C         483          INC   ENTBLK         ;right one
0B18:A0 00         484          LDY   #$00           ;try another one
0B1A:B1 0B         485          LDA   (SYSSTK),Y
0B1C:38            486          SEC
0B1D:65 0B         487          ADC   SYSSTK
0B1F:85 0B         488          STA   SYSSTK
0B21:90 ED   0B10  489          BCC   NEXT5
0B23:E6 09         490          INC   SYSSTK+1
0B25:D0 E9   0B10  491          BNE   NEXT5          ;not there yet.
0B27:A0 00         492 FOUND    LDY   #$00           ;we've made it
0B29:B1 0B         493          LDA   (SYSSTK),Y     ;now go and store in
0B2B:8D 00 03      494          STA   FILE           ;the right spot
0B2E:AA            495          TAX
0B2F:C8            496 FOUND1   INY
0B30:B1 0B         497          LDA   (SYSSTK),Y
0B32:99 00 03      498          STA   FILE,Y         ;copy it over
0B35:CA            499          DEX
0B36:D0 F7   0B2F  500          BNE   FOUND1
0B38:20 E4 0B      501          JSR   SETPFX         ;SET UP THE PREFIX
0B3B:20 A3 0B      502          JSR   OPEN           ;open up the file
0B3E:20 4A 0B      503          JSR   SYSEOF         ;when does it finish?
0B41:20 70 0B      504          JSR   SYSREAD        ;Read it in
0B44:20 71 09      505          JSR   CLOSE          ;and close it down
0B47:4C 00 20      506          JMP   $2000          ;and execute it
0B4A:              507 *
0B4A:              508 * this routine gets the length
0B4A:              509 * of the chosen file and copies this
0B4A:              510 * to the read routines request bytes
0B4A:              511 *
0B4A:AD B6 08      512 SYSEOF   LDA   REFNUM         ;get its number
```

```
0B4D:8D 6C 0B      513          STA   EOF+1          ;and now get its
0B50:8D 7D 0B      514          STA   SYSREAD1+1     ;length
0B53:20 00 BF      515          JSR   MLI
0B56:D1            516          DB    $D1
0B57:6B 0B         517          DW    EOF
0B59:F0 03   0B5E  518          BEQ   EOF2
0B5B:4C 5E 0B      519          JMP   ERROR          ;broke?
0B5E:AD 6D 0B      520 EOF2     LDA   EOF+2          ;Tell the read routine
0B61:8D 80 0B      521          STA   REQUST         ;how much to read in
0B64:AD 6E 0B      522          LDA   EOF+3
0B67:8D 81 0B      523          STA   REQUST+1
0B6A:60            524          RTS
0B6B:02            525 EOF      DB    $2
0B6C:00            526          DB    $0
0B6D:00 00 00      527          DB    $0,$0,$0
0B70:              528 *
0B70:              529 * read in the system file requested
0B70:              530 *
0B70:20 00 BF      531 SYSREAD  JSR   MLI
0B73:CA            532          DB    $CA
0B74:7C 0B         533          DW    SYSREAD1
0B76:F0 03   0B7B  534          BEQ   SYSREAD2
0B78:4C 5E 08      535          JMP   ERROR
0B7B:60            536 SYSREAD2 RTS
0B7C:04            537 SYSREAD1 DB    $4
0B7D:00            538          DB    $0
0B7E:00 20         539          DW    $2000
0B80:00 00         540 REQUST   DW    00
0B82:00 00         541          DW    0
0B84:              542 *
0B84:              543 * this routine splits up the
0B84:              544 * file name if it is longer than
0B84:              545 * 63 into two halves one of which
0B84:              546 * is a prefix, the other bit
0B84:              547 * is used by open
0B84:              548 *
0B84:AD 00 03      549 REHASH   LDA   FILE           ;get the length
0B87:C9 3F         550          CMP   #$3F           ;more than 63
0B89:B0 0C   0B97  551          BCS   REHSH2         ;yep so go and split
0B8B:A2 40         552          LDX   #$40           ;up,no so copy
0B8D:BD 00 03      553 REHSH1   LDA   FILE,X         ;it to the open
0B90:9D B0 02      554          STA   $280,X         ;commands file address
0B93:CA            555          DEX
0B94:10 F7   0B8D  556          BPL   REHSH1
0B96:60            557          RTS                  ;and return
0B97:4A            558 REHSH2   LSR                  ;divide by two
0B98:AA            559          TAX
0B99:BD 00 03      560 REHSH3   LDA   FILE,X         ;search for a /
0B9C:C9 2F         561          CMP   #$2F
0B9E:F0 03   0BA3  562          BEQ   REHSH4         ;found one ?
0BA0:CA            563          DEX                  ;now so back up a bit
0BA1:D0 F6   0B99  564          BNE   REHSH3
0BA3:8A            565 REHSH4   TXA                  ;got one
0BA4:48            566          PHA                  ;save the length
0BA5:BD 00 03      567 REHSH5   LDA   FILE,X         ;make this bit into a
0BA8:9D B0 02      568          STA   $280,X         ;prefix
0BAB:CA            569          DEX
0BAC:10 F7   0BA5  570          BPL   REHSH5
0BAE:68            571          PLA                  ;say how long it is
0BAF:8D B0 02      572          STA   $280           ;
0BB2:CE B0 02      573          DEC   $280           ;knock one off
0BB5:20 00 BF      574          JSR   MLI
0BB8:C6            575          DB    $C6
0BB9:C0 0B         576          DW    PREFIX         ;set the prefix
0BBB:F0 06   0BC3  577          BEQ   REHSH5.1       ;no errors so continue
0BBD:4C 5E 08      578          JMP   ERROR
0BC0:01            579 PREFIX   DB    $1
0BC1:B0 02         580          DW    $280
0BC3:AD B0 02      581 REHSH5.1 LDA   $280           ;now copy the rest to
0BC6:18            582          CLC                  ;the correct place for
0BC7:69 02         583          ADC   #$02           ;open command
0BC9:AA            584          TAX
0BCA:AC 00 03      585          LDY   FILE
0BCD:A9 00         586          LDA   #$0
0BCF:99 02 03      587          STA   FILE+2,Y
0BD2:A0 00         588          LDY   #$00
0BD4:BD 00 03      589 REHSH6   LDA   FILE,X
0BD7:F0 07   0BE0  590          BEQ   REHSH7
0BD9:99 81 02      591          STA   $281,Y
0BDC:E8            592          INX
0BDD:C8            593          INY
0BDE:D0 F4   0BD4  594          BNE   REHSH6         ;done yet
0BE0:8C B0 02      595 REHSH7   STY   $280           ;save the length
0BE3:60            596          RTS
0BE4:              597 *
0BE4:              598 * this routine sets the system prefix
0BE4:              599 * for badly behaved system programs which do
0BE4:              600 * not look at $280 to find out where they are
0BE4:              601 * The assembler is a good example of this
0BE4:              602 * perhaps someone should tell apple
0BE4:              603 *
0BE4:A0 02         604 SETPFX   LDY   #$02           ;skip the first
0BE6:A9 2F         605          LDA   #$2F           ;/
0BE8:8D 81 02      606          STA   $281           ;store a slash in
0BEB:B9 00 03      607 SETPFX2  LDA   FILE,Y         ;in the right place
0BEE:99 80 02      608          STA   $280,Y         ;now copy the name
0BF1:C8            609          INY                  ;of the volume
0BF2:C9 2F         610          CMP   #$2F           ;over and make it the
0BF4:D0 F5   0BEB  611          BNE   SETPFX2        ;prefix
0BF6:88            612          DEY
0BF7:8C B0 02      613          STY   $280           ;set up the length
0BFA:20 00 BF      614          JSR   MLI            ;use the Rehash prefix
0BFD:C6            615          DB    $C6            ;list
0BFE:C0 0B         616          DW    PREFIX
0C00:F0 03   0C05  617          BEQ   SETPFX1
0C02:4C 5E 08      618          JMP   ERROR
0C05:60            619 SETPFX1  RTS                  ;and go back whence we came
```

appletip

Using the backs of Apple discs is frowned upon by some, but done by most. For peace of mind, VERIFY each file under DOS when saving a file.

Any file which does not verify under DOS can be renamed RUBBISH. Under the Pascal system do a BAD BLOCK scan after formatting.

Don James

The connectors used by the cassette I/O turn into superfluous holes if you use disc drives because information storage on cassette isn't used any more in this case. But the cassette I/O function can still be used for interconnecting two Apples. Data can be transferred if the receiving Apple acts like a cassette recorder.

Now, connecting the output of Apple No 1 to the input of Apple No 2 is not effective as the output signal has an amplitude of 25 millivolts peak to peak whereas the input needs a signal in the range of 1 volt peak to peak.

The amplitude of the output signal can be changed to 1 volt peak to peak by changing an attenuator inside the Apple. To do this the value of resistor R9 is changed from 100 ohms to 6800 ohms. You'll find it on the main board of the Apple IIe near the cassette connector.

To send a Basic program from Apple 1 to Apple 2 type LOAD followed by Return on No 2 to make it start listening. Now type SAVE followed by Return on No 1 to make it start sending data. Keep to this sequence, otherwise data may not be transferred completely.

In the same way it is possible to transfer data from the monitor. Even the commands STORE, RECALL and SHLOAD have their function back.

Martin Keesen

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Lowdown on CP/M

The full potential of CP/M on the Apple can be yours – explore it with ROBERT NEALE. First of a new series.

CP/M version 2 in one form or another has been available on Apple II computers for a long time. This is interesting given that the Apple is a 6502 based machine and CP/M was written as an operating system for the 8080 microprocessor.

Many people use CP/M every working day on their Apples but know little about it. This state of affairs is crying out to be rectified and hopefully this series will help you to understand "What it is", "How do I use it", and "How does it work."

In fact there is more than one form of CP/M available on Apple computers – all from third party vendors – and although CP/M is billed as the universal standard for 8 bit machines there are differences which we will have to consider.

Most users appear to have the Microsoft version but unfortunately there is more than one form of this.

However, CP/M is pretty standard so by describing Microsoft's version 2 and digressing where necessary into CP/M 3 commands we should be okay.

CP/M (Control Program for Microprocessors) was the creation of one man – Doctor Gary Kildall. He was working for Intel and needed a rudimentary operating system to marry the new 8080 microprocessor with the new floppy disc drives which were appearing. These were the 8in variety known to old hands as the regular or standard floppy.

Kildall left Intel and was approached and asked to provide CP/M for another floppy drive controller.

He made the decision to split CP/M into parts, one to control the screen, keyboard and disc I/O and the other to handle the actual nitty-gritty of disc operations and other I/O. This is usually called the low-level operations of I/O.

This meant that the second part, known as the BIOS (Basic Input and Output System), could be changed from machine to machine while the first part, known as the BDOS (Basic Disc Operating System) could remain constant.

Thus the way was open for the CP/M system to appear on many micros. It was popular because it was there and also it appeared the same to the user on a variety of different machines.

Next, Zilog produced the Z80 microprocessor which incorporates the old opcodes of the 8080 but which has a much extended range of operating commands.

This at once means that Z80 based microcomputers can use CP/M as an operating system but also, unfortunately for the user, the programs which come with CP/M, such as DDT, only know the older 8080 codes. This is a subject to which we will return.

Microsoft, the maker of the well-known Basic, produced a Z80 card for the AppleII+ known as the Softcard which comes with CP/M as the operating system. This is the card which most users have.

There are several forms of this card and it has been distributed with CP/M v2.20, v2.23, and more recently with v2.25 which are all versions of the same generic CP/M known as CP/M 2.2.

Digital Research, the owner of CP/M, also makes cards for the Apple II series of computers. These Gold Cards come with CP/M v3 (often known as CP/M Plus) and also give an 80 column output and bank switching capabilities to increase the memory available.

More recently Cirtech has introduced a new system for the IIc and IIe (where a precious Apple slot is not used) which replaces the microprocessor – the 65C02 – with a board which carries the Z80 and 65C02. This Cirtech system also comes with CP/M v3.

There are other systems on the market but generally they do not appear as popular as these three. I have no personal experience of them but CP/M is, of course, used in the same way.

Each of these Apple CP/M cards effectively gives the user a new computer and of course they are not identical. Memory is used in a different way and consequently the BIOS of each system is different. However, as far as I know, the physical and logical formats used on 5.25in discs is identical and hence files can be transferred easily between them.

On each manufacturer's system, entry to CP/M is the same. Insert a system disc – more on this later – into drive 1 of slot 6 and switch on the machine or use Open-Apple-Control-Reset. You will very quickly see a Copyright or sign-on message which varies from system to system. This will be followed by the CP/M prompt A> which is the same on all machines.

Actually > is the prompt and the A signifies that you are logged on the A drive (or drive 1 of slot 6). Under CP/M drives are labelled A, B, C, D and so on. A and B will correspond to drives 1 and 2 of slot 6. Other drives may not necessarily be in order – C, D . . . may be missing. This is especially true if your system has been patched in order to recognise ram discs.

If you type DIR or dir, because CP/M will recognise both upper and lower case commands, you will see a directory listing of your boot up or system disc.

You'll note that most of the files have three letters after the name. This is the filename extension which can be anything you want it to be, but also it can mean something to CP/M.

The most important extension is COM which sig-

appletip

Taming Tricky Dick

Users of the CIA programs may have experienced an annoying problem when disassembling a sector to printer with Tricky Dick. Unless the last instruction ends at $FF – that is, the next opcode starts at $100 – Tricky Dick will throw out approximately four pages of BRKs. This problem can be fixed by patching Tricky Dick as follows:

```
CALL -155
BLOAD TRICKY DICK
1CBA:C0 2F
BSAVE TRICKY DICK,A$0803,L$3800
```

nifies that the file is executable. Examples are MBASIC and CPM56, both of which appear on the system disc from Microsoft v 2.20, or WS, the usual file name for Wordstar).

At the keyboard such files are executed by typing their name. For example MBASIC followed by Return will call up Microsoft Basic and WS will execute Wordstar.

But at other times the files are referred to by name and extension, the two parts being separated by a period. Thus MBASIC.COM or WS.COM are what you would type if in PIP – a file transfer program which we will turn to soon.

The full specification of a file will also include the drive on which it resides but it is not necessary if you want to refer to the logged drive.

The drive specification is given by the drive letter, followed by a colon and the name, maybe with extension.

Note that spaces are not tolerated in this scheme of things. Thus Basic could be called up by typing MBASIC, or A:MBASIC or, if the file is in drive B, by B:MBASIC.

Returning to the directory listing you will not see the actual CP/M system files appearing on the list. CP/M 3 will warn you that system files are present, CP/M 2.2 does not.

I have already mentioned the BDOS and BIOS, but there are other CP/M parts with equally mystifying names to which you should be introduced. The most important is the CCP (Command Control Processor). This is the part of CP/M which lets you talk to your machine.

Even more important for programmers is a system of function calls they can make, thus freeing themselves from the tricky problem of having to write the necessary parts.

When a COM file is loaded the CCP is overwritten because it is no longer needed. When you exit the program the CCP will be reloaded from disc.

COM files are loaded into an area of memory known as the TPA or Transient Program Area. This usually starts at the hexadecimal address of 100H – this is the Z80 way of writing hex numbers, it's the same as the 6502's $100 – but not all CP/M machines do, so beware!

The other parts of memory contain the system parameters (in the SPA – System Parameter Area) and the BDOS and BIOS. The usual memory map is shown in Figure I. From this you can see that the CCP lies in the TPA and why it is necessary to reload it after using a program.

Next month I will cover the operation of the CCP but for the moment I'll leave you with a tip which many people do not know. Before using any new system you should back up your discs and only use the copies. With CP/M the disc copy programs vary from manufacturer to manufacturer – you will have to consult your manuals which come with the machine.

But on the Apple at least all of you can copy your disparate system discs by using COPYA from DOS or the system filer from ProDOS.

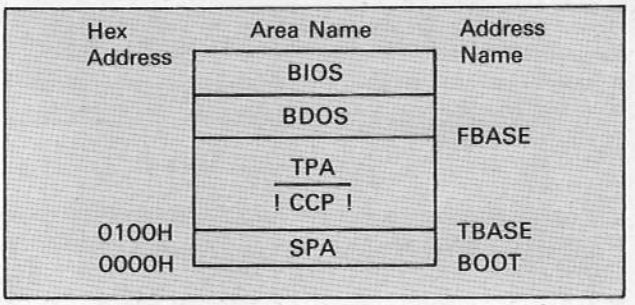

Figure I

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Access

In the September 1985 Apple User, the second Pascal Tutorial Series addressed itself to the use of Units in Apple Pascal. The aim of this new series is to go beyond the introductory stage and develop a set of Units which will be useful for anyone developing programs under Apple Pascal.

The Unitary approach to program development

By STUART BELL

WHEN UCSD Pascal was first made available in the late 1970s, the concept of a Unit was perhaps its most revolutionary feature – apart from the achievement of putting Pascal on to a micro, something that many had said was impossible!

A Unit is a piece of Pascal code, much like a program, which may be stored in a library and used by any program which requires it. Thus frequently used procedures may be kept in this "recipe book" and need not be rewritten each time. Like good recipes, they have been shown to work and produce the required results.

Using Units allows us to avoid repeatedly compiling such building blocks each time we write a new program. Indeed, if such an approach is taken to its limit, user programs become little more than a series of calls to procedures in pre-existing units.

Effectively, we are able to extend the Pascal language to do very complex operations by means of one statement. This approach has been used both by Apple – for example in providing the Applestuff and Turtlegraphics units – and also by independent software programmers who have written Units to provide graphics and database functions within Apple Pascal.

Three "building blocks" – major Pascal Units – will be developed. They will in turn deal with screen handling, printer control and disc management. I hope that they will both illustrate the value of a unit-orientated approach to programming and also prove useful tools in their own right.

Perhaps at this point we should note that Apple Pascal provides two kind of units, Regular and Intrinsic.

The differences are explained on page 76 of the Apple Pascal Language Manual. In short, Regular Units are not linked into a Library, but rather the code is linked into each and every file which uses the Unit. Thus much re-compilation is necessary, and much disc space wasted by many copies of the same code.

This series will deal with Intrinsic units, which I'll simply refer to as Units. We hope that you will use the Units in your own personal programs but please, if you are writing commercial applications, drop us a line if you wish to use them.

A little examination of your programs probably reveals huge amounts of code doing little more than providing pretty on-screen displays. Writing input and output routines can be a very time-consuming task.

However, many such jobs are the same in many programs – routines to get a yes/no reply from the keyboard, to clear part of the screen, or to check for Escape being pressed are examples of screen operations which most programs require. Thus they are ready-made candidates for a Unit.

There is, however, one problem which may not be immediately apparent to the Apple II user who only writes programs for use on his own machine – terminal dependence.

When, with a standard II+, you have the statement:

```
write (chr(29));
```

you can be sure that it will clear the line to the right of the cursor. That is, the character whose Ascii code is 29 (decimal) is termed the "clear to end of line character", and the BIOS (Basic Input/Output System) of Apple-Pascal will recognise it as such.

But if you use that same program on a different computer, or even on an Apple with an external terminal or display card, it is by no means certain that chr(29) will perform in that way. Indeed, it might produce a totally unwanted side-effect, such as locking the keyboard. This is not a rare problem, as those who have tried to use the up/down arrows in a program required to run both on the II+ and IIe will have found.

The designers of the UCSD p-System recognised this problem and built into it a file called SYSTEM.MISCINFO which stores information about the hardware on which the system is running. Every system has such a file.

Various ones are supplied with the Apple Pascal 1.2 system to handle the II+ and IIe with 40 and 80 column screens. The editor and filer look at this file to determine how they should display information. The SETUP.CODE program supplied on the APPLE3: disc allows us to modify SYSTEM.MISCINFO.

The point of this discussion is that within this file are the codes which will produce certain effects on the screen (such as "clear to end of line"), and also the codes of the keys which indicate special actions (for example, "up arrow").

Thus if we make our screen-control unit read the SYSTEM.MISCINFO file when it starts, it can be totally terminal independent and our programs will work with any screen, any terminal and even any computer running the UCSD p-System – without us having to worry about the particular codes used by particular hardware.

So how do we make sense of SYSTEM.MISCINFO? Officially, Apple Computers has never released a description of the structure of the file. However, a number of folk, by using SETUP to change one value and then examining the file to see which bytes or even single bits have changed, have enabled us to reconstruct the declarations that might have been used to define the data structures concerned. These are given in Listing 1.

By using that declaration in our Screen Control Unit, and reading the contents of SYSTEM.MISCINFO into the variable "miscinfo", we can then access the codes used for special keys and cursor control. Let us now turn to the tasks we want the Unit to perform.

The main problem is to develop a set of procedures which meet most needs, without the whole thing getting too large. Remember that we shall place the Unit in SYSTEM.LIBRARY and that even on two-drive systems we haven't got an excess of disc space. One or two Units have been published in the past – a simple one by Ray Bollinger is given in All About Pascal published by Call-A.P.P.L.E.

However, little uniformity was achieved until Softech Microsystems, the originators of version IV of the UCSD p-System, defined a standard Screen Control Unit for that

version, with the intention that all programmers should use the same unit. Such a standard has never been defined for version II.1 (Apple Pascal), so it would seem to make sense to have our Apple User Screen Control Unit follow Softech's specification.

The interface section of the unit is shown in Listing II. Note that if your keyboard cannot generate the under-score characters, simply enter the listing without them. Apple Pascal ignores them, but don't replace them by anything else, such as hyphens.

It is not a complete implementation of the version IV unit, partly because some procedures in it are very complex and would take several articles to themselves, but primarily because some things – for example, keeping track of the cursor position – are not easily accomplished under Apple Pascal.

Nevertheless, the procedures listed provide an adequate range of facilities for most programmers, and it can easily be extended as required. As for the implementation of the Unit, that will have to wait until next month.

Listing I

```
miscrec = packed record
    (* contents of SYSTEM.MISCINFO see pages 208 & 209
                          of Apple Pascal Op Sys Manual *)
                filler1 : packed array [0..28] of integer;

                filler2,    (* fillers indicate unused bytes   *)
                filler3,
                student,    (* forces edit after syntax errors *)
          hasslowterminal,  (* suppresses long messages        *)
  hasrandomcurosraddressing,(* ie can do a gotoxy              *)
             haslowercase,  (* old terminals often didn't!!    *)
                 has8510a,  (* refers to a Terak minicomputer  *)
                 hasclock   (* hardware clock - 1/60 sec ticks *)
                        :boolean;

                filler4 : integer;

              erasescreen,
                eraseline,
         verticalmovedelay, (* actually a count, 0..255        *)
                backspace,
                  movecup,  (* ie move cursor up  etc...       *)
               movecright,
                eraseeol,
                eraseeos,
           movecursorhome,
           leadintoscreen   (* the 'prefix' character used by
                               some terminals                  *)
                        : char;

              preerline,    (* booleans to indicate if the     *)
            preerscreen,    (* respective codes are prefixed   *)
           predcharacter,   (* yes, the order IS inconsistent! *)
               premchome,
                preereos,
                preereol,
              premcright,
                 premcup : boolean;

             screenwidth,
            screenheight : integer;

          editoracceptkey,  (* now follow the codes generated  *)
        leadinfromkeyboard, (* by various keys                 *)
          editorescapekey,
              keytodline,
            nonprintchar,
       keytodeletecharacter,
              keyforstop,
             keyforbreak,
             keyforflush,
            keytoendfile,
            keytomcright,
             keytomcleft,
             keytomcdown,
              keytomcup : char;
               filler5 : integer;

               filler6,
               filler7,
               filler8,
        predacceptkey,      (* and now the booleans to show    *)
      prekeydcharacter,     (* if the terminal sends a prefix  *)
          prekeydline,      (* ie preceded by 'leadinfromkeyboard' *)
        preedescapekey,
        prekeyendfile,
          prekeyflush,
          prekeybreak,
           prekeystop,
       prenonprintchar,
           prekmcdown,
             prekmcup,
           prekmcleft,
          prekmcright : boolean;

              filler9 : packed array [97..511] of 0..255
                        (* to fill up whole block *)
          end;
```

Listing II

```
{$S+}
unit screenops;  intrinsic code 27 data 28;

interface
    uses applestuff;          (* use keypress function
                                 in sc_space_wait!    *)
type

     (* copy into here the definition of miscrec,
        as in Listing 1                                 *)

        sc_chset        = set of char;
        sc_key_command  = (eof,etx,dline,escape,delchar,up,down,
                           left,right, sc_not_legal);

  var  mfile:file;

  procedure sc_left;
  procedure sc_right;
  procedure sc_up;
  procedure sc_down;
  procedure sc_erase_to_eol(x,line:integer);
  procedure sc_clr_screen;
  procedure sc_clr_line (y:integer);
  procedure sc_home;
  procedure sc_eras_eos (x,line:integer);
  procedure sc_getc_ch(var ch:char; return_on_match:sc_chset);
  function  sc_map_crt_command(var k_ch:char):sc_key_command;
  function  sc_space_wait(flush:boolean):boolean;
  function  sc_width:integer;
  function  sc_height:integer;
```

Ignore a pixel or two and shrink your pictures

Max Parrott offers a Hi-res Picture Reducer, to be used in conjunction with Paul Sinnett's Hi-res Picture Editor

PAUL Sinnett's Hi-res Picture Editor, featured in the June, July, and August issues of *Apple User* has generated a lot of interest.

By coincidence a couple of readers have written asking if there is a way of reducing a hi-res picture in size.

I thought that the algorithm to do that must be very complex because there are so many ways in which a pixel could influence its neighbours. That is, should a point be plotted in the reduced version if there are 2, 3, 4 or more neighbours which are lit and which colours to use?

Actually, taking the simplistic approach of ignoring every other pixel, both vertically and horizontally works surprisingly well (see Figure I) although colour information and, of course, some detail are lost (see Figure II).

However, Paul's editor offers a manual way of "repairing" a reduced picture and so I produced the following routine. (Listing I is a Lisa generated assembly language source.)

The quickest way of entering this program – which uses the standard Basic subroutine HPOSN at $F411 which I have not tested on the enhanced roms – is to enter the monitor and directly enter the bytes. If you have never done this before, boot your system and get to Basic. Type CALL-151 and press return, you will see a * as a prompt.

If you study Listing I you will see that on the left of the listing is a set of four digit numbers (in the hexadecimal form), then a space then one, two or three more numbers, a bigger space and a decimal number which is the line number of this source listing.

The first number is the memory address at which the code has been assembled. We will enter the first part of the code. Note that the code proper starts at $1000, so we enter:

1000:A9 0 8D 54 C0 8D 50 C0 8D 50 C0 8D 57 C0

and press Return. By doing this we have filled the bytes sequentially from $1000 with the values we want. The next address is $100B so we repeat, starting with this address.

You can enter any number of bytes from 1 up to the maximum you can cram into about 230 characters (around six lines of 40 column text) but generally don't be tempted to enter too many, it becomes unwieldy.

You can check your entry by typing 1000L followed by Return. You will see the addresses at the left, followed by the bytes you entered, followed by the assembler commands which are much the same as in Listing 1. Carefully compare them to the end and if satisfied, save the file to disc by typing:

BSAVE PICREDUCER.OBJ, A$1000,L$93

The program works at the simplest level, that is, only the even numbered pixels are plotted in the reduced picture. The result is a picture one quarter of the size of the original. Generally the result is reasonably impressive and the reduced picture is instantly recognised; sometimes it's lacking a little information but with Paul's editor you can quickly knock it into shape.

Listing II is a simple Basic program to load your picture into hi-res page 1 and to save the result. Note that no protection is offered against disc errors.

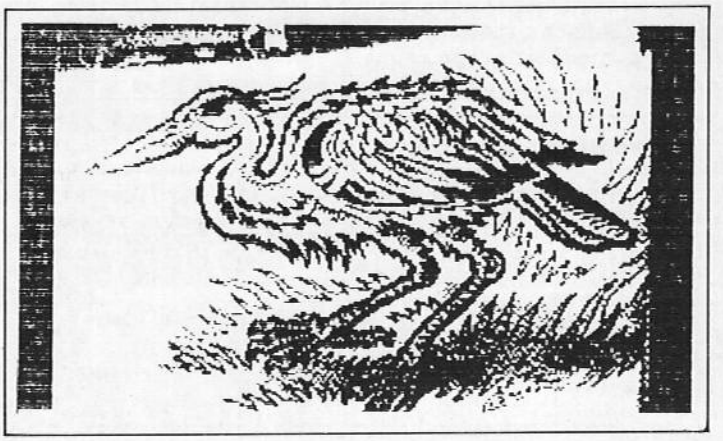


Figure I: The simplistic approach works surprisingly well

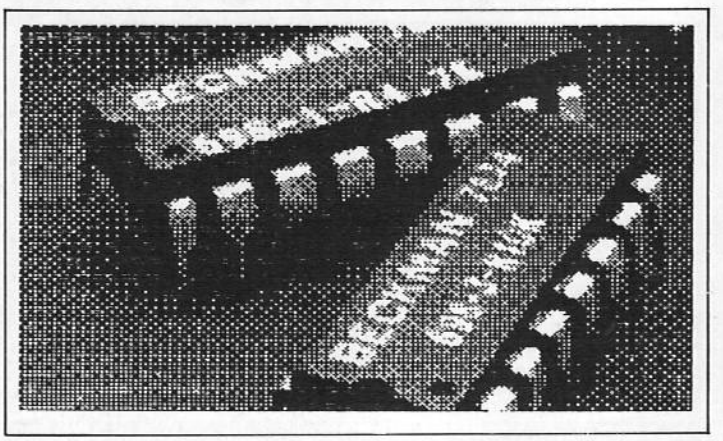
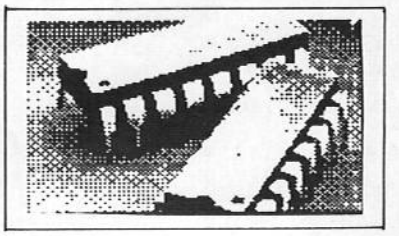


Figure II: But colour information and some detail are lost



```
10  HIMEM: 16 * 256
20 D$ =  CHR$ (13) +  CHR$
   (4)
30  PRINT D$"BLOAD
   PICREDUCER.OBJ"
40  TEXT : HOME : VTAB 5
50  PRINT "THIS PROGRAM WILL
   REDUCE A HIRES"
60  PRINT "PICTURE TO ONE
   QUARTER OF ITS"
70  PRINT "SIZE AND THEN
   SAVE IT TO DISK AS"
80  PRINT "A NORMAL 33
   SECTOR PICTURE FILE."
90  VTAB 12: INPUT "ENTER
   THE PICTURE NAME ";A$
100  HOME : VTAB 5: PRINT
   "PUT THE SOURCE DISK IN
   DRIVE 1 AND"
110  GOSUB 230
120  PRINT
   D$"BLOAD"A$",A$2000,D1"
130  HOME : VTAB 5: PRINT
   "YOU WILL SEE THE PICTURE
   REDUCED"
140  PRINT "PRESS SPACE BAR
   TO RETURN TO TEXT"
150  VTAB 20: INPUT "ENTER
   FILE NAME TO SAVE PICTURE
   ";A$
160  CALL 16 * 256
170  GOSUB 240
180  TEXT : HOME : VTAB 5:
   PRINT "INSERT DESTINATION
   DISK IN"
190  PRINT "DRIVE 1"
200  GOSUB 230
210  PRINT
   D$"BSAVE"A$",A$2000,L$1FFE
   ,D1"
220  END
230  PRINT "PRESS SPACE BAR
   WHEN READY"
240  GET S$
250  IF S$ = " " THEN
   RETURN
260  GOTO 240
```

Listing I

```
0800                 1  * ROUTINE TO REDUCE A HIRES
0800                 2  * PICTURE TO ONE QUARTER OF
0800                 3  * ITS SIZE, BLACK & WHITE
0800                 4  *
0000                 5  DESTROW  EPZ $0
0001                 6  SRCROW   EPZ $1
0002                 7  DESTADD  EPZ $2
0004                 8  TEMP     EPZ $4
0005                 9  DESTIND  EPZ $5
0006                10  SRCIND   EPZ $6
F411                11  HPOSN    EQU $F411
1000                12           ORG $1000
1000                13  *
1000                14  *
1000 A9 00          15  START    LDA #0
1002 8D 54 C0       16           STA $C054          ;SWITCH TO PAGE 1
1005 8D 50 C0       17           STA $C050          ;GRAPHICS
1008 8D 57 C0       18           STA $C057          ;HIRES
100B 8D 52 C0       19           STA $C052          ;FULL GRAPHICS
100E 85 00          20           STA DESTROW
1010 85 01          21           STA SRCROW
1012 85 05          22           STA DESTIND
1014 85 06          23           STA SRCIND
1016 A9 20          24           LDA #$20
1018 85 E6          25           STA $E6            ; MAKE IT PAGE 1
101A A5 00          26  LOOP     LDA DESTROW
101C 20 8C 10       27           JSR ADDRESS
101F A5 26          28           LDA $26
1021 85 02          29           STA DESTADD
1023 A5 27          30           LDA $27
1025 85 03          31           STA DESTADD+1
1027 A5 01          32           LDA SRCROW
1029 20 8C 10       33           JSR ADDRESS
102C A0 00          34           LDY #0
102E 84 05          35           STY DESTIND
1030 84 06          36           STY SRCIND
1032 A4 06          37  LOOP0    LDY SRCIND
1034 A2 03          38           LDX #3
1036 B1 26          39           LDA ($26),Y
1038 6A             40  LOOP1    ROR
1039 66 04          41           ROR TEMP
103B 6A             42           ROR
103C CA             43           DEX
103D 10 F9          44           BPL LOOP1
103F C8             45           INY
1040 A2 02          46           LDX #2
1042 B1 26          47           LDA ($26),Y
1044 6A             48           ROR
1045 6A             49  LOOP2    ROR
1046 66 04          50           ROR TEMP
1048 6A             51           ROR
1049 CA             52           DEX
104A 10 F9          53           BPL LOOP2
104C 6A             54           ROR
104D 66 04          55           ROR TEMP
104F C8             56           INY
1050 84 06          57           STY SRCIND
1052 A4 05          58           LDY DESTIND
1054 A5 04          59           LDA TEMP
1056 91 02          60           STA (DESTADD),Y
1058 C8             61           INY
1059 84 05          62           STY DESTIND
105B C0 14          63           CPY #20
105D D0 D3          64           BNE LOOP0
105F A9 00          65           LDA #0
1061 91 02          66  LOOP3    STA (DESTADD),Y
1063 C8             67           INY
1064 C0 28          68           CPY #40
1066 D0 F9          69           BNE LOOP3
1068 E6 00          70           INC DESTROW
106A E6 01          71           INC SRCROW
106C E6 01          72           INC SRCROW         ;SKIP ONE
106E A5 01          73           LDA SRCROW
1070 C9 C0          74           CMP #192
1072 D0 A6          75           BNE LOOP
1074 A5 00          76           LDA DESTROW
1076 20 8C 10       77  LOOP4    JSR ADDRESS
1079 A9 00          78           LDA #0
107B A8             79           TAY
107C 91 26          80  LOOP5    STA ($26),Y
107E C8             81           INY
107F C0 28          82           CPY #40
1081 D0 F9          83           BNE LOOP5
1083 E6 00          84           INC DESTROW
1085 A5 00          85           LDA DESTROW
1087 C9 C0          86           CMP #192
1089 D0 EB          87           BNE LOOP4
108B 60             88  END      RTS
108C A2 00          89  ADDRESS  LDX #0
108E A0 00          90           LDY #0
1090 4C 11 F4       91           JMP HPOSN
1093                92           END
```

Listing II

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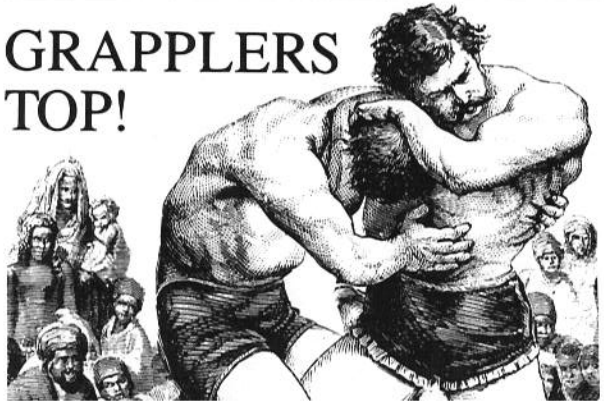

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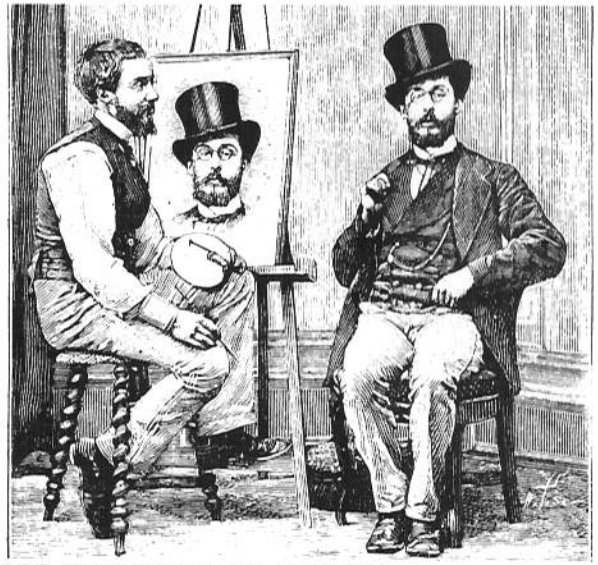

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In the game you command either NATO or Warsaw Pact forces. To help you there is a full colour poster map, together with a detailed instruction booklet.

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

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TO ORDER, PLEASE USE THE FORM ON PAGE 61

DODGE IT

THIS time a hi-res game from Dunstan Marris, which is simple to understand and enter. The default key moves are I – up, M – down, K – right, and J – left but these may be changed.

The game may also be played with a joystick, which makes it considerably easier to stay alive for a long time because you can jump from one part of space to another. You have to select the joystick operation from the initial menu as the default is keyboard play.

```
10 MK = 0:I$ = "I":M$ =
   "M":K$ = "K":J$ = "J":SH
   = 10
20  REM       SET UP
30  HOME
40  HCOLOR= 7
50 BALL = 1
60 YY = 100:YX = 100
70 SCO = 0
80  GOSUB 1230
90  HGR2
100 S =  - 16336:A =  PDL
   (1)
110  FOR SPOT = 1 TO 100
120 V =  INT ( RND (A) *
   270)
130 B =  INT ( RND (A) *
   192)
140  HPLOT V,B
150  NEXT
160 XOLD = 20:YOLD = 38
170 UOLD = 10:KOLD = 100
180 ROLD = 150:ZOLD = 100
190 XMOVE = 15
200 UMOVE = 15
210 RMOVE =  - 15
220 YMOVE = 15
230 KMOVE =  - 15
240 ZMOVE = 15
250  GOTO 790
260  REM     <<<ATOM
   LASER>>>
270 XNOW = XOLD + XMOVE
280 UNOW = UOLD + UMOVE
290 RNOW = ROLD + RMOVE
300  IF (XNOW < 15) OR (XNOW
   > 260) THEN 340
310  IF (UNOW < 15) OR (UNOW
   > 260) THEN 360
320  IF (RNOW < 15) OR (RNOW
   > 260) THEN 380
330  GOTO 440
340 XMOVE =  - 1 *
   XMOVE:XNOW = XNOW + XMOVE
350  GOSUB 390: GOTO 320
360 UMOVE =  - 1 *
   UMOVE:UNOW = UNOW + UMOVE
370  GOSUB 390: GOTO 320
380 RMOVE =  - 1 *
   RMOVE:RNOW = RNOW +
   RMOVE: GOSUB 390: GOTO
   440
390  FOR B = 1 TO 5
400 BOUNCE =  PEEK (S) -
   PEEK (S) +  PEEK (S) -
   PEEK (S)
410 SCO = SCO + .1
420  NEXT
430  RETURN
440 YNOW = YOLD + YMOVE
450  GOTO 500
460 KNOW = KOLD + KMOVE
470  GOTO 540
480 ZNOW = ZOLD + ZMOVE
490  GOTO 560
500  IF (YNOW > 15) AND
   (YNOW < 175) THEN  GOTO
   640
510 YMOVE =  - 1 * YMOVE
520  GOSUB 590
530  GOTO 250
540  IF (KNOW > 15) AND
   (KNOW < 175) THEN  GOTO
   690
550 KMOVE =  - 1 * KMOVE:
   GOSUB 590: GOTO 250
560  IF (ZNOW > 15) AND
   (ZNOW < 175) THEN  GOTO
   740
570 ZMOVE =  - 1 * ZMOVE:
   GOSUB 590: GOTO 250
580  GOTO 250
590  FOR B = 1 TO 5
600 BOUNCE =  PEEK (S) -
   PEEK (S) +  PEEK (S) -
   PEEK (S)
610 SCO = SCO + 1
620  NEXT
630  RETURN
640  HCOLOR= BALL
650  HPLOT XNOW,YNOW TO XNOW
   + 15,YNOW + 15: HPLOT
   XNOW + 15,YNOW TO
   XNOW,YNOW + 15
660  HCOLOR= 0
670  HPLOT XOLD,YOLD TO XOLD
   + 15,YOLD + 15: HPLOT
   XOLD + 15,YOLD TO
   XOLD,YOLD + 15
680 YOLD = YNOW:XOLD = XNOW:
   GOTO 460
690  HCOLOR= BALL
700  HPLOT UNOW,KNOW TO UNOW
   + 15,KNOW + 15: HPLOT
   UNOW + 15,KNOW TO
   UNOW,KNOW + 15
710  HCOLOR= 0
720  HPLOT UOLD,KOLD TO UOLD
   + 15,KOLD + 15: HPLOT
   UOLD + 15,KOLD TO
   UOLD,KOLD + 15
730 KOLD = KNOW:UOLD = UNOW:
   GOTO 480
740  HCOLOR= BALL
750  HPLOT RNOW,ZNOW TO RNOW
   + 15,ZNOW + 15: HPLOT
   RNOW + 15,ZNOW TO
   RNOW,ZNOW + 15
760  HCOLOR= 0
770  HPLOT ROLD,ZOLD TO ROLD
   + 15,ZOLD + 15: HPLOT
   ROLD + 15,ZOLD TO
   ROLD,ZOLD + 15
780 ROLD = RNOW:ZOLD = ZNOW:
   GOTO 250
790  REM       <<<YOUR
   MOVE>>>
800  HCOLOR= 0
810  HPLOT YX,YY TO YX +
   10,YY: HPLOT YX + 5,YY -
   5 TO YX + 5,YY + 5
820  IF  PEEK ( - 16384) >
   127 THEN  GET A$
830  IF (A$ = I$) AND  NOT
   MK THEN YY = YY - SH
840  IF MK THEN YY =  PDL
   (1)
850  IF YY > 180 THEN YY =
   180
860  IF  NOT MK AND (A$ =
   M$) THEN YY = YY + SH
870  IF YY < 10 THEN YY = 10
880  IF  NOT MK AND (A$ =
   K$) THEN YX = YX + SH
890  IF MK THEN YX =  PDL
   (0)
900  IF YX > 260 THEN YX =
   260
910  IF  NOT MK AND (A$ =
   J$) THEN YX = YX - SH
920  IF YX < 10 THEN YX = 10
930  HCOLOR= 7
940  HPLOT YX,YY TO YX +
   10,YY: HPLOT YX + 5,YY -
   5 TO YX + 5,YY + 5
950  REM       <<<CHECK>>>
960  HCOLOR= 0
970  IF  SQR ((YX - XNOW +
   7.5) * (YX - XNOW + 7.5)
   + (YY + 5 - YNOW + 7.5) *
   (YY + 5 - YNOW + 7.5)) <
   15 THEN 1010
980  IF  SQR ((YX - UNOW +
   7.5) * (YX - UNOW + 7.5)
   + (YY + 5 - KNOW + 7.5) *
   (YY + 5 - KNOW + 7.5)) <
   15 THEN 1010
990  IF  SQR ((YX - RNOW +
   7.5) * (YX - RNOW + 7.5)
   + (YY + 5 - ZNOW + 7.5) *
   (YY + 5 - ZNOW + 7.5)) <
   15 THEN 1010
1000  GOTO 260
1010  HPLOT YX,YY TO YX +
   10,YY: HPLOT YX + 5,YY -
   5 TO YX + 5,YY + 5
1020  HCOLOR= 7:YY = YY + 1
1030  HPLOT YX,YY TO YX +
   10,YY: HPLOT YX + 5,YY -
   5 TO YX + 5,YY + 5
1040  IF YY > 180 THEN  GOTO
   1080
1050  HCOLOR= 0
1060  HPLOT YX,YY TO YX +
```

```
   10,YY: HPLOT YX + 5,YY -
   5 TO YX + 5,YY + 5
1070  GOTO 1020
1080  TEXT : HOME : PRINT "
   W   E   L   L   D   O   N
   E"
1090  PRINT
   "WWEELLLLDDOONNEE"
1100  PRINT
   "WWEELLLLDDOONNEE"
1110  PRINT "  W   E   L   L
   D   O   N   E"
1120  PRINT : PRINT : PRINT
   : PRINT
1130  PRINT "YOUR SHIP HAS
   FALLEN OUT OF A HYPER"
1140  PRINT "-SPACE LEARNER
   AREA.  IT IS HEADING"
1150  PRINT "LUCKILY TO THE
   JUNK-YARD OF SCIODAN."
1160  PRINT "IT WILL NOT DO
   TOO MUCH DAMAGE THERE"
1170  PRINT "I HOPE.  BUT
   YOU DID GET A SCORE OF:"
1180  PRINT , INT (SCO)
1190  POKE  - 16368,0
1200  PRINT : PRINT : PRINT
   "DO YOU WANT TO PLAY
   AGAIN": INPUT GAM$
1210  IF  LEFT$ (GAM$,1) =
   "Y" OR  LEFT$ (GAM$,1) =
   "y" THEN 20
1220  HOME : END
1230  HGR2 :R = 65
1240 X = 70:Y = 65:C =  COS
   (.1):S =  SIN (.1)
1250 X1 = R:Y1 = 0:FL = 0
1260  FOR I = 1 TO 64:T = X1
   * C - Y1 * S:Y1 = Y1 * C
   + X1 * S:X1 = T
1270 SX = X1 + X:SY = Y1 + Y
1280  IF FL THEN 1310
1290  HPLOT SX,SY TO SX +
   60,SY + 60
1300 FL = 1: NEXT
1310  HPLOT  TO SX + 60,SY +
   60 TO SX,SY TO 70,65
1320  HPLOT SX + 60,SY + 60
1330  NEXT
1340  TEXT : HOME
1350  VTAB (10): PRINT
   "*(R)ULES*(N)EW
   KEYS*(J)OY STICK*(S)TART"
1360  GET CHO$
1370  IF CHO$ = "R" THEN
   GOSUB 1450
1380  IF CHO$ = "N" THEN
   1640
1390  IF CHO$ = "J" THEN MK
   = 1
1400  IF CHO$ = "S" THEN
   RETURN
1410  GOTO 1360
1420  FOR D = 1 TO 700: NEXT
   D
1430  RETURN
1440  REM
   <<INSTRUCTIONS>>
1450  HOME
1460  PRINT "D DO OD D6 6E
   EI IT T"
1470  PRINT " D  O  D  6  E
   I  T"
1480  PRINT " D  O  D  6  E
   I  T"
1490  PRINT "D DO OD D6 6E
   EI IT T"
1500  PRINT : PRINT "
   BY:
1510  PRINT "     D. MARRIS"
1520  PRINT : PRINT
1530  PRINT "RULES: KEEP AS
   FAR AWAY FROM THE
   CROSSES"
1540  PRINT "AS YOU CAN,
   THEY'VE GOT L-PLATES!"
1550  PRINT "BUT DON'T THINK
   I'M STUPID IF I"
1560  PRINT "TAKE TIME TO
   REACT, I'M ONLY A"
1570  PRINT "BEGINNER AT
   THIS YOU KNOW!"
1580  PRINT : PRINT
1590  PRINT "PLAY WITH THE
   SHIFT LOCK ON"
1600  PRINT : PRINT : PRINT
1610  PRINT "PRESS ANY KEY
   TO CONTINUE"
1620  GET GAM$
1630  GOTO 1340
1640  REM     MAKE KEYS
1650  HOME
1660  PRINT "D DO OD D6 6E
   EI IT T"
1670  PRINT " D  O  D  6  E
   I  T"
1680  PRINT " D  O  D  6  E
   I  T"
1690  PRINT "D DO OD D6 6E
   EI IT T"
1700  PRINT : PRINT : PRINT
   : INPUT "UP-";I$
1710  INPUT "DOWN-";M$
1720  INPUT "RIGHT-";K$
1730  INPUT "LEFT-";J$
1740 MK = 0: GOTO 1340
```

American cure for the enhanced IIe

By JAROMIR SMEJC

ENHANCING the Apple IIe with the new roms can bring a number of desirable benefits including pull-down menus, better graphics and faster running.

But the incompatibility problem of some software written for a normal IIe which does not work in the enhanced IIe (which I call the IIec) is a sad reality. Furthermore some software written for the IIec cannot be used on the IIe at all.

Unfortunately, the problem lies not only with the 65C02 and the character generator rom but also with the monitor roms, so the simple remedy discussed in Creative Computing and June's Feedback *(Apple User,* page 58, letter by Kenneth McQuillan) whereby a board switches between old and new character generators is only good for some software problems.

Lee Harris in the September issue of *Apple User* (page 59) points out that on the American market there is a product called the Switchback from Computer Accents, which really is an excellent solution for this problem. But – and now the bad news – it is only for the American Apple IIe.

As I pointed out in my August *Apple User* article (page 58) the European and American Apples have a completely different motherboard layout, so the reason the Switchback will not work in European Apples is a simple one – it will not fit!

If you have an American Apple IIe the Switchback is available in England from MGA Microsystems of Tenterden, Kent. It consists of a PCB with eight ICs, some resistors, six sockets, a selector switch ("old" and "new") and selection logic circuitry.

The sockets are for the enhanced set of three ICs (one character rom and two monitor roms) and the normal (or old) set of the same. An optional external pushbutton allows you to select one of the rom sets without having to open the case of the Apple.

The Switchback does not use an expansion slot but plugs directly into the three sockets on the American Apple IIe motherboard which formerly housed the original roms.

You can decide which mode is preferred for startup by using the switch. If the optional, external pushbutton is fitted you can hold this down as the Apple is switched on and start in the other mode.

In order to install the Switchback you need the Apple IIe Enhancement Kit and the old roms as well. You can buy the enhancement kit from your local dealer but be sure that you will be able to keep all the old roms.

Because *Apple User* readers come from all over the world and may not be sure which kind of Apple they have here is a picture to help. Figure I is of the main board layout of an American and Figure II of an European Apple IIe.

You will clearly see why the Switchback cannot be used on the Euroapple IIe – the sockets are in completely different locations.

Let's hope that a European company will soon start producing a similar product for the Euroapple IIe and that Apple never commit the same mistake again.

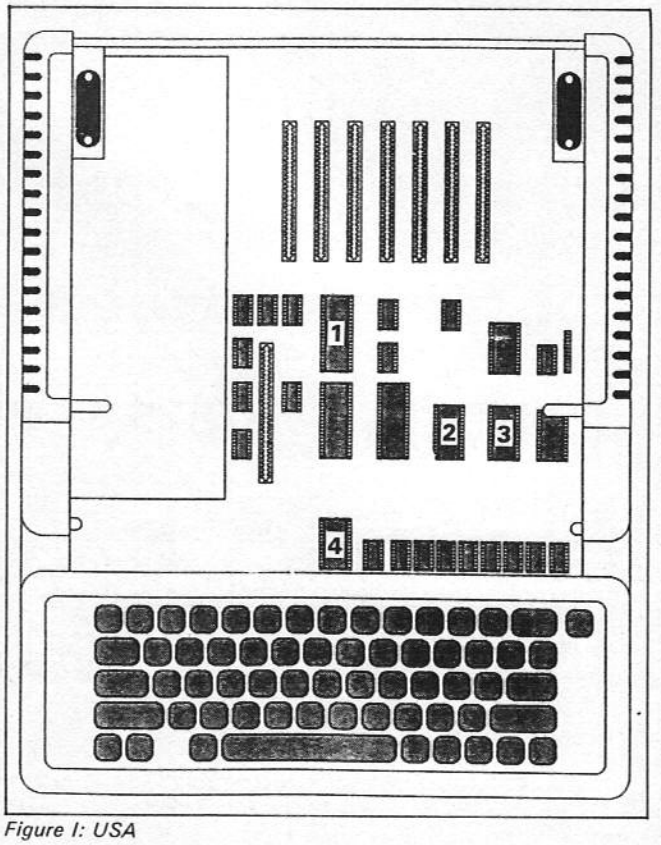


Figure I: USA

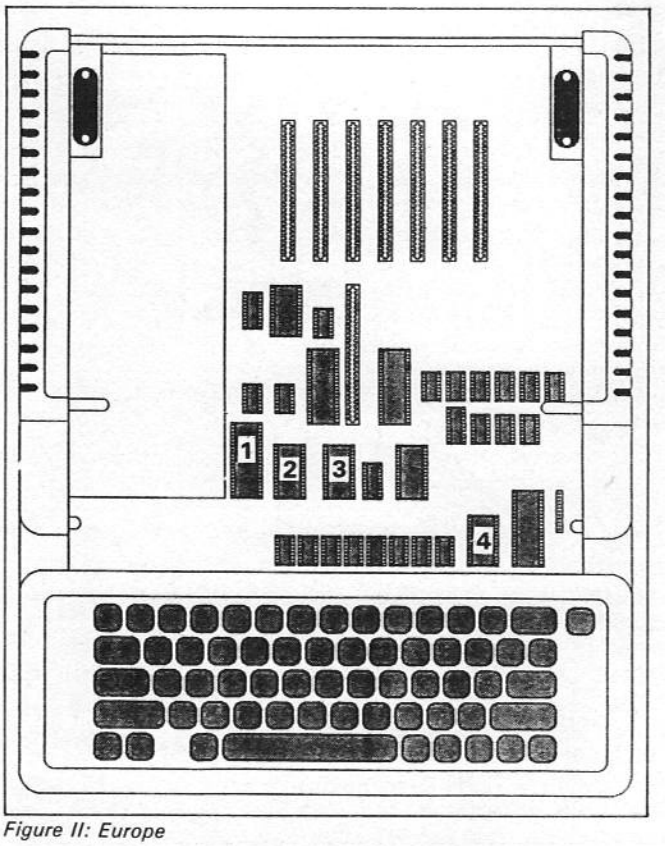


Figure II: Europe

Boosting maths capability in Basic

I HAVE an Apple II europlus and was wondering if there is any product, hardware or software, which would allow the mathematics capability of my micro to be boosted and be accessible through Basic – preferably Applesoft, but if necessary any other version.

What I need from this product is high accuracy – 16 significant digits if possible and standard trigonometric, logarithmic and hyperbolic trigonometric functions.

All these are available on most scientific calculators except possibly the accuracy criteria, so my needs are not really that specialised.

I have already tried MBASIC (under CP/M) but this only satisfied the first criterion with only 4 decimal place accuracy available when trigonometric and logarithmic functions were used.

I have contacted most of the large Apple dealers but have had no success. – **A.S. Karlcut, Birmingham.**

● As you have probably realised MBASIC is actually less accurate than Applesoft when using trigonometric and logarithmic functions and should be avoided although it does have double precision available for simple arithmetic.

Most micros do not have much accuracy built-in to their mathematical functions as there is a trade-off between accuracy and memory. The newer ones such as the Macintosh and the new Apple IIGS do have greater precision – up to 80 bit.

The simple built-in functions of Basic, namely SIN, COS, TAN, ATN, SQR and LOG may be built up into other, more complex functions. For example:

SECANT	=	1/COS(X)
COSECANT	=	1/SIN(X) COTANGENT = 1/TAN(X)
ARCSIN	=	ATN(X/SQR(–X*X+1))
ARCCOS	=	–ATN(X/SQR(–X*X+1))+1.5708
SINH	=	(EXP(X)–EXP(–X))/2.0
COSH	=	(EXP(X)+EXP(–X))/2.0
TANH	=	SINH/COSH
SECH	=	2/(EXP(X)+EXP(–X))
ARCSINH	=	LOG(X+SQR(X*X+1))
ARCCOSH	=	LOG(X+SQR(X*X–1))
ARCTANH	=	LOG((1+X)/(1–X))/2.0

The easiest way for you to increase accuracy is probably to use Turbo Pascal under CP/M as you already have the operating system. You will then have an 11 digit accuracy for real (floating point) numbers.

Alternatively you will have to write the routines yourself which is no trivial matter. Apple produces a manual for IEEE standard mathematical operations. This may be helpful to you but you will have to apply directly to Apple for it.

Enhanced spreadsheet

IN response to Chris Burridge's request in the July issue for improvements to his Stock Market spreadsheet here are some from my Multiplan templates.

I am a less active, long term investor with a more extensive portfolio. So first of all I have a Sector column next to the Holding column (C54-64 in the illustration). This tells me where to find the share prices in my paper. When I do a valuation I first SORT on this column between the appropriate rows making it easy to enter the current prices.

Next I am nterested in long term growth rates, so next to the Purchase date column (G11-22) I have a Month No. column giving the month of purchase counting from an arbitrary zero, say January 1970. This month number simplifies subsequent time related calculations.

*Further purchases are similarly dated and next to the Total gross investment (G54-64) I have a money weighted average month number such as sum of £*months divided by total investment. At valuation a Compound annual growth yield column is entered using:*

EXP(LN(present value/gross investment)/(current month no. – investment month no.)*12)–1

Dividend dates occupy three columns, dd mm yy. This allows me to SORT on each column in turn to provide a dividend listing in date order. For my annual tax return I can print out the list from April 6 of one year to April

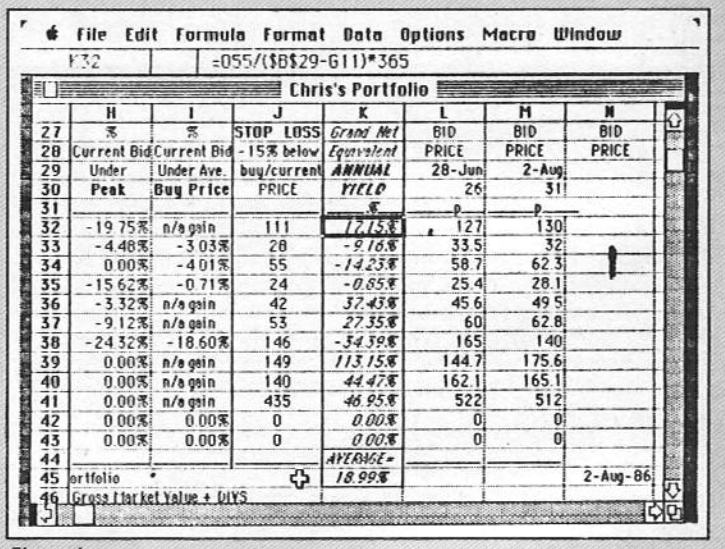


Figure I

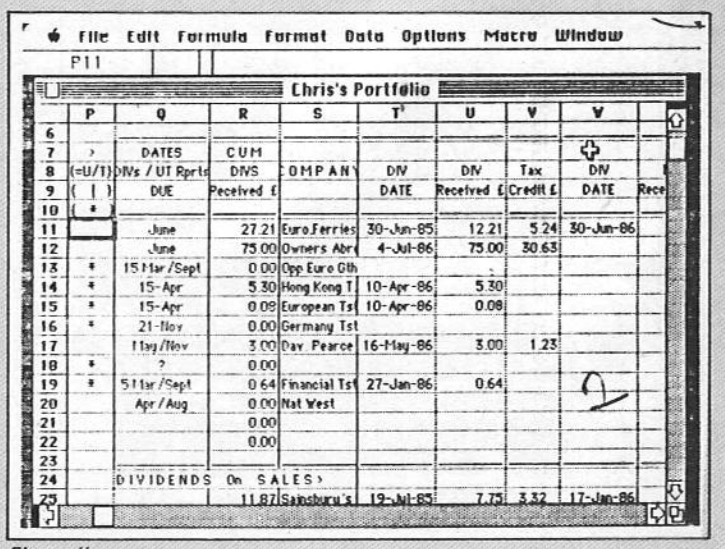


Figure II

5 of the next. For fiscal reasons I also enter tax credits in the column next to the dividends.

Dividends received during the 12 months preceding the valuation are totalled for each holding, divided by the present value and placed in a Dividend yield column.

Finally a Total return column is produced by adding growth yield to dividend yield. This total return tends to iron out general market fluctuations because a rise in price increases the growth yield but decreases the dividend yield and vice versa. However, an increase in dividend followed by (or anticipated by) a price rise increases the total return.

Extensive use is made of the SORT command to examine the portfolio by size of holdings, sector allocations and returns. Comparing the league tables of one period with those of the next highlights the stocks out of line. – **Louis Baker, Northwood, Middlesex.**

● Chris Burridge replies: I like Louis Baker's sorting ideas although readers should be warned that once a block has been sorted it is sometimes difficult to unsort and results are not always as intended. I speak from experience. My template was designed therefore strictly on the KISS basis (Keep It Simple Stupid).

The compound 'time' yield column suggested is excellent although more relevant for investors looking for income. You'll see from Figure I that I've already adopted Louis' idea into my template – the arithmetic simply divides the net % gain in cell 055 by the number of days stock has been held multiplied by 365 for one year. Note that one of the joys of Excel is the easy manipulation/calculation of dates.

Dividend yields can be calculated with either net or gross income – and on moving market value as Louis does or possibly more accurately on the fixed gross investment in that stock. For capital growth I still prefer my *absolute* ongoing percentages on capital at cells B82/84. The important point is that which ever method you use to monitor investment performance you must bear in mind current inflation and market rates.

As to the tax return problem I've already enhanced my own spreadsheet to incorporate Tax credit columns (see Figure II) and agree with Louis this is really essential. I simply rule off the sales table dividends in tax years and refer to the dividend table for current holdings.

Louis' Sector column is sensible although it may vary in different newspapers – and you soon get the breakfast time sleepy-eyed knack of knowing exactly where to look.

Finally, my article appears to have created quite a bit of reaction and requests for ready made templates. For the benefit of readers who cannot spare the time to reconstruct the model, I'll gladly supply it but only in Excel format. Just send a blank disc together with a nominal £10 to "Cillacrest", 69 The Dormers, Highworth, Swindon, Wilts. SN6 7PB – and as a bonus I'll throw in the monthly budgets and petrol economy models already published.

CP/M on the Apple II

CAN you please give me some basic information on the use of CP/M programs on the Apple? – **G.P. Owen.**

● To run CP/M on an Apple II you need a Z80 card of some form, the operating system on disc and an 80-column display card. A printer is also useful because most CP/M software is for serious, business use.

You have probably read that CP/M offers the greatest range of software available on micros. This is both true and false – up to a point.

First, CP/M probably did offer the greatest range in the past but I should imagine that most quality software is now offered on MSdos format for the various IBMs and IBM look-alikes. If you are looking for new software to do some task or other for your business I suspect, though it pains me to say it, that an IBM compatible may be the best route for the foreseeable future, at least until the new Apple IIGs becomes available.

Second, although CP/M offers a lot of software it is not necessarily readily available on Apple format discs, although to be fair all the well-known titles are on Apple.

CP/M has been through different versions over the years. The latest is known as CP/M Plus or CP/M 86 or CP/M version 3, but most Apple users actually have CP/M version 2 from Microsoft. This also comes in slightly different versions – version 2.20 runs in 44k or 56k depending on whether a language card is present in a II+ and v.2.23 runs in 60k if a language card is present. With a IIe you already have the language card built in.

Recently a new version 2.25 has come from Microsoft and this does not run on the old Z80 cards and presumably just about all of the Z80 clones.

Other manufacturers also produce versions of CP/M 2 for the Apple. Probably the best known is the Star card but it is relatively rare. You get different software with the card, for example there are routines to put text on the hi-res screen so that you don't need an 80-column card (CP/M really needs an 80-column display).

The other manufacturer of CP/M cards for the Apple which is worth considering is Cirtech. They produce a Z80 card which will run Microsoft's CP/M v.2.20 and v.2.23 and another card which doesn't occupy a slot but goes in the microprocessor socket of a IIe (or IIc) and which runs CP/M 3 and which comes with the operating system on two discs.

Theoretically any piece of CP/M software, once available on the Apple II disc format, will run on any CP/M version in an upwards compatible fashion. That is, if written under v.2 it will run on 2.20, 2.23 and 3.0 but if written under v.3 you cannot necessarily expect it to run under v.2.

Generally I have found this to be true – the only real trouble comes with the odd 80-column display card on the Apple. If you have a IIe with an Apple or Apple type 80-column card you should not experience any trouble. Likewise a II+ with a Videx or Ultraterm type card will be okay – the difficulty comes with a Vision-80 on a II+ with some but not most software.

To use CP/M you need:

● A program to format discs and copy them – this changes names from manufacturer to manufacturer.

● A program to copy files between discs (and other peripherals such as printer cards and modems). This is known as PIP and tends to come in versions 2 and 3, for CP/M 2 and 3.

● A program to tell you about your system and disc usage is useful. This comes on v. 2, as STAT and on v. 3 as DIR.

● A language sometimes to manipulate text files or to do something similar. Microsoft CP/M comes with MBASIC. You can also buy BBCBASIC, CBASIC, FORTRAN, C, and probably the most generally useful, Turbo-Pascal.

Irritating display

AS you all know, the listings displayed by a standard Apple II computer are very annoying as they are limited to 33 characters per line.

This is extremely bad when you want to check a program by the listing. I was wondering if you know of any commands to change this. I hope so as I am getting sick about this. – **Betrand Lee, Winthrop, Western Australia.**

● You may find it more comfortable with a narrowed text window (Esc , followed by POKE33,33) but I doubt it. Your best solution is to buy one of the Basic program editors such as ACE or the Lostock Editor which abound at most dealers.

Stuck in the old routine

COULD you please help me with the program on hi-res scrolling in the May issue? I have found that once the routine is called (27461) the pages scrolls as mentioned. Unfortunately it does not seem to return from the subroutine that is called. I have pin-pointed the problem to address 6B7A – CPY 38. – **B. Winter.**

● I ran the program again and it appears to return quite happily from the subroutine at $6B45 (27461) which suggests that your version of the program probably has an error in it. As you say, the flag for quitting the program is the CPY #38 at $6B7A which suggests to me that the Y register is not reaching #38.

However, quite how the page can scroll and yet Y not reach 38 is beyond me because Y is set towards the end of the loop by being loaded from N2 (at $6B75) and N2 is increased from its original value of 20 (at $6B51) by one at $6B80. Perhaps you could check these locations to see if the appropriate memory locations are being used correctly. N2 is $FC.

JX-80 software

PLEASE advise me if there is a way – software and/or hardware – to make my Epson JX-80 colour printer compatible with programs which run only on the Imagewriter printer.

If the JX-80 is fully compatible with software which runs on the Epson FX and RX lines of printers, and if not, how can I make it so?

Is it a waste of money to buy a super high resolution RGB monitor (Amdek 710) for my Apple IIe 128k with an 80 col card?

I have heard that it will not fully utilise the resolution of such high resolution monitors.

Is there a way around this problem and what is the best RGB card for the above monitor. – **N.M. Eldib, Manama, Bahrain.**

● We have no direct experience of the JX-80 but it should obey the commands of the FX and RX series, and of course, more besides.

Programs which expect to print to an Imagewriter could be made to print to the JX-80 if you can isolate the printing routines and change them – a thing much easier said than done!

Graphics is the biggest problem. The JX-80 uses Esc,r, (colour code) to select a "primary" colour and so is easily programmed to print in one colour by yourself.

Rumour has it that Penguin's Paper Graphic, Koala's Graphics Exhibitor and Wagner's Printographer can cope with the JX-80, but check – we haven't seen them.

If you plan to use 80 column text screens in colour you definitely do need a good resolution monitor. It is very hard with a low or even medium resolution monitor. Ask for a demo before buying.

Express delivery

IN the March 1986 Apple User *a news item gave some details of a Program Exchange Division of Software Express. Could you please give the address of Software Express?* – **P. Grover, Batley.**

● Certainly, Software Express are at 514-516 Alum Rock Road, Alum Park, Birmingham B3 8HX. Tel: 021-328 3585.

Budget plotter

A BUDGET printer/plotter capable of 80 column printing is now available for the Apple II series.

Manufactured by Comx World Operations and distributed by Digital Delicatessen, the PL-80 operates as a 10cps Ascii printer or a software controlled plotter.

The slow Ascii printing rate is compensated for by a top speed of 92mm per second with a resolution of 0.2mm per step when the printer runs in plotting mode.

In addition to the usual plot and draw commands, the PL-80 is compatible with the centronics-driven commands used by Lotus 1-2-3 and SuperCalc, making it – at £150 – an extremely low-cost plotter for the new Apple IIGS.

● *Digital Delicatessen, Unit 204, 22 Highbury Grove, London N5 2EE.*

Mac-IBM link

DATA recording equipment manufacturer Cristie Electronics has released MicahTops, a local area network capable of connecting to two different operating systems which also works as a distibuted file server.

It is compatible with AppleTalk and supports LaserWriter, allowing Macintosh computers to take advantage of its printing capabilities.

MicahTops allows the Macintosh to share files with IBM PCs or compatibles. Files can be transported directly between workstations without delay regardless of whether the files are resident on, or created by, machines of dissimilar operating systems.

Machine compatibility is achieved by translating local system requests into universal requests recognisable by the MicahTops software on any machine in the network. For instance, a Macintosh user can view the directory of the hard disc of an IBM AT, the directory appearing in Macintosh format as icons on a desktop.

Users may access and work with files stored on remote drives exactly as if they were internal to their own machine, regardless of the type of operating system.

Data is shared transparently and networking activities occur in the background with no disruption to normal computer operations. Once the MicahTops network is loaded into each machine no special procedures are needed to access remote programs or files.

Information is transferred at 800,000 bits per second and the software occupies about 15k of memory on each participating Macintosh. Price £149.95.

● *Cristie Electronics, Bonds Mill, Bristol Road, Stonehouse, Glos. GL10 3RF. Tel: 045-382 3611.*

Card expanded

THE Apple II compatible 80 column card range from Rosco is expanded by the new Resolution 128.

This 80 column card for the IIe sits in the auxiliary slot and gives another 128k of memory to the machine's existing 64k, providing 192k of ram.

Supplied with Resolution 128 is Ramdrive e/c Dos or CP/M software which uses the extra memory as a ram disc the size of a single sided disc.

Rosco has reduced the price of Resolution and Resolution 64 cards to £19 and £29 respectively.

Resolution 64 is also being offered with Ramdrive e/c Dos or CP/M. Termed Resolution 64+, it costs £59.

● *Rosco, 289 Birchfield Road, Birmingham B20 3DD. Tel: 021 356 7402.*

Business workstation

WELL known for its Head Start workstations for the handicapped, Macintosh specialist Bit 32 has announced a series of business workstations for the general public.

Fronting the range is the Bit 32 Desk Top Publishing Workstation for printer/publishing operations, price £8,751.

The other three modules in the series are a PA Workstation for secretarial staff, price £9,157, a Design Workstation for architects, engineers and other technical designers, price £8,941 and an Accounts Workstation for accounting, payroll and business planning roles, price £6,167.

The pre-configured Workstation systems are priced between £1,000 and £2,000 below manufacturers SSP.

Training and installation are included, and as an added bonus Bit 32 is upgrading each MacPlus to 2mb ram at no extra charge.

● *Bit 32, 32 North John Street, Liverpool L2 9QJ. Tel: 051 227 3232.*

Perception course

NEW from US educational publisher Instructional/Communications Technology is Processing Power courseware for the Apple II series.

The programs provide perceptual processing training that heightens a reader's ability to recognise, store and use visual impressions during reading.

Each basal correlated program contains 30 reading selections from Keys to Reading, Ginn Reading Program, Bookmark Reading Program, Reading Basics Plus, Houghton Mifflin Reading Program, Holt Basic Reading System, and Scott Foresman Reading program.

There are four discs in each basal correlated program with seven or eight reading selections per disc, a total of 30.

Processing Power is designed for use with both developmental and special education students. The manner in which reading selections are presented visually is varied to produce different training outcomes according to a student's needs.

Each four-disc basal costs $180. Additional teacher guides are available for $10 and back-up sets are available at half-price.

● *Instructional/Communications Technology, 10 Stepar Place, Huntington Station, New York 11746. Tel: 516 549 3000.*

pH board for Apple II

CHEMICAL laboratory automation specialist Fylde Scientific has produced the pH Meter Board for the Apple II series.

It plugs directly into a user slot to create a research grade pH/ISE meter which can be programmed to meet the user's specific needs.

The board allows ion selective or pH electrodes to be connected directly to the micro, eliminating the difficulties encountered when interfacing a pH meter to a computer.

In addition to the basic software provided with the pH Meter Board, the company also markets a range of advanced software to provide all the features normally found in the latest breed of pH meters.

These include auto-buffering, automatic recognition of the BS standard buffer solutions and determination of electrode stability, Gran's plots, standard addition analysis, and others.

● *Fylde Scientific, 23 West Paddock, Leyland, Preston, Lancs. PR5 1HR. Tel: 0772 720257.*

Database management

DBASE Mac, a relational database management system, is to be Ashton Tate's first release for the Macintosh.

Features include pop-up menus and dialogue boxes which serve as navigation aids, prompting users with lists of options and choices.

The Quick Create option provides a template for data entry screens and reports.

Custom multi-field reports can be generated without programming. Users can select type styles and sizes, design and draw on the screen, and store and incorporate graphic images.

Dbase Mac requires a Macintosh with 512k of ram or a Macintosh Plus and at least one 800k floppy disc drive. Price around £600.

● *Ashton Tate, 1 Bath Road, Maidenhead, Berkshire SL6 4UH. Tel: 0628 33123.*

BACK ISSUES

Catch up on articles you may have missed. Back issues from January 1985 are still available at £1.25.

January 1985

John Sculley's View of 1985 – Games (Gelfling Adventure, Story Maker, Stellar 7) – Application: Apples down on the Farm – Cloze Technique (Plus review of Clozemaster) – World of the 6809 Part II: Flex Operating System – Apple II v ITT 2020 – Reviews (Ormbeta Compact Accounting System, CGL Half-Height Drive) – Apple IIe and IIc compatibility – Handling Interrupts and large arrays in Pascal – Reporter's view of Macintosh – PLUS News, New Products, Appletips and Letters.

February 1985

Steve Wozniak talks about Apple II developments – Quicksort algorithm in Forth and Basic – Games (Deadline, Witness, Planetfall, Enchanter, Scorcerer, Expedition Amazon) – Graphics DIY part XI – Targeting with a spreadsheet – Apple to Apple file transfer – Miners' strike resolved by computer? – Chemical formulae on Lisa – two Macintosh books reviewed – World of the 6809 Part III – Software reviews (Sales Edge and Management Edge) – Application: book publishing – Split screen techniques – PLUS News, new products and letters.

March 1985

Circle drawing algorithms – Super Pilot System Log – Summarising data with VisiCalc – Competitive estimating with Multiplan – Graphics DIY part XII – Ampersand editing – Macintosh (MacTerminal, Mouse Stampede, optical mouse, plus Mac book) – Reviews (Merl modem, Intec hard drive, Vision 128/256 card, the Editor, plus three educational packages) – Fun and Games (Xyphus, Fighter Command, Picture Writer) – PLUS News, New products, letters and Appletips.

April 1985

Apples in the dental surgery – Adding graphics commands to Applesoft – Using the VBLANK signal – Getting to grips with software – Reviews (Spee-Demon card, PFS File/Report for Macintosh, W-P-LAB) – Weather forecasting with Mac – Pascal Filer's D command – Fun and Games (La Triviata, Design Your Own Home: Architecture, Interiors, Landscape) – Books (Appleworks, VisiCalc, Machine level programming) – Index to Windfall Vols. 1 and 2. PLUS News, New products, Letters and Appletips.

May 1985

Sports Day runs smoothly 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) – Bin-search 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

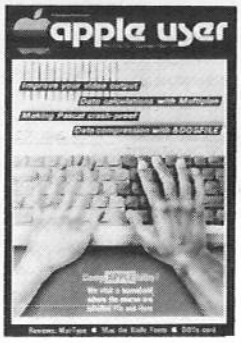
Apples keep track of music companies and Macintosh designs record sleeves – Fun and Games (Music Construction Set, Song Writer, Music Readiness) – Pascal Tutorial: start of a new series looks at records – Reviews (Tick-Tack translation package for Apple II+/IIe, Musicworks for Macintosh) – Graphics (three 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

Apples at the heart of Papworth Hospital – Fun & Games (Secret of Arendarvon Castle, Antagonists, Fahrenheit 451, Rendezvous with Rama, Amazon, Shadowkeep, Adventure Writer) – Pascal Tutorial: using files of records – Binary file load utility – Using extended 80 column card memory – Macintosh (Flowcharting, Preview of Guide) – Book reviews (Business Basic, Epson printers) – Reviews (FingerPrint and Printerrupt) – Graphics DIY Part XIV – DOS patches – PLUS News, New Products, Letters and Appletips.

August 1985

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



September 1985

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

October 1985

&DOSFile: start of a new series – spreadsheet for home budgets – Apples in a Hertfordshire college – using Page 3 routines with a language card – Graphics DIY Part XVI – Reviews (Ramworks extended 80-column card, Computereyes and Magic digitisers) – add a 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

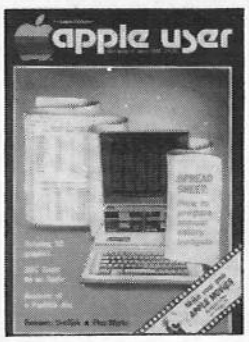
Graphics Library final part plus disc offer – MEMDOS operating system – calculating duty rosters with a spreadsheet – Macintosh: reviews of Microsoft's Excel and P&P's fat Mac upgrade – ProDOS gives Applesoft new lease of life – Review of Cirtech CP/M Plus system for IIc – Apple word processors compared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

December 1985

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

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.



April 1986

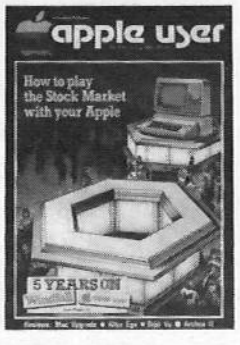
Pascal tutorial: Tips and books – Fun & Games (Mac Wizardry, Brataccas, Enchanted Scepters and Airborne) – Comms: budget equipment interfaced Part 2, software to simulate a simple teletype terminal – Spreadsheet: annual salary budgets – Graphics: machine code routine to rotate 3D wire frame images –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

May 1986

Making of a monster Macintosh – Fun & Games (Ultima IV, Spellbreaker, Captain Goodnight) – Scrolling hi-res pages – Making the most of Wordstar – Spreadsheet: presenting balance sheets in visual form – ProDOS Part 2 – Reviews (Supercharged Apple II with Snapshot Shuttle and Cirtech Flipper, Jeeves for desktop facilities) – DOS amendment to display free sectors – Application! Apples in use in a technical college – PLUS all the latest Apple news and your letters.

June 1986

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



July 1986

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

August 1986

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

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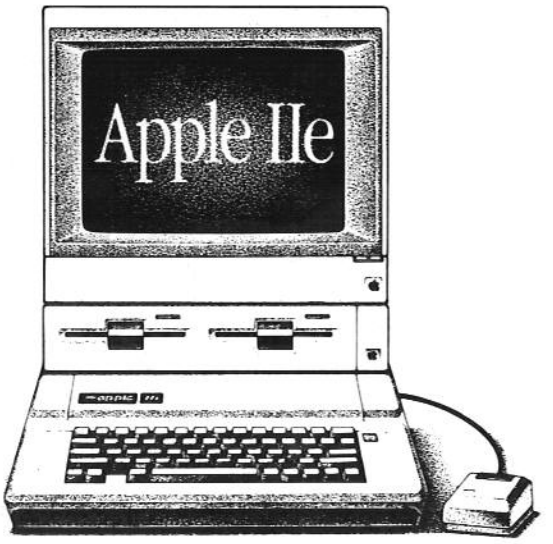

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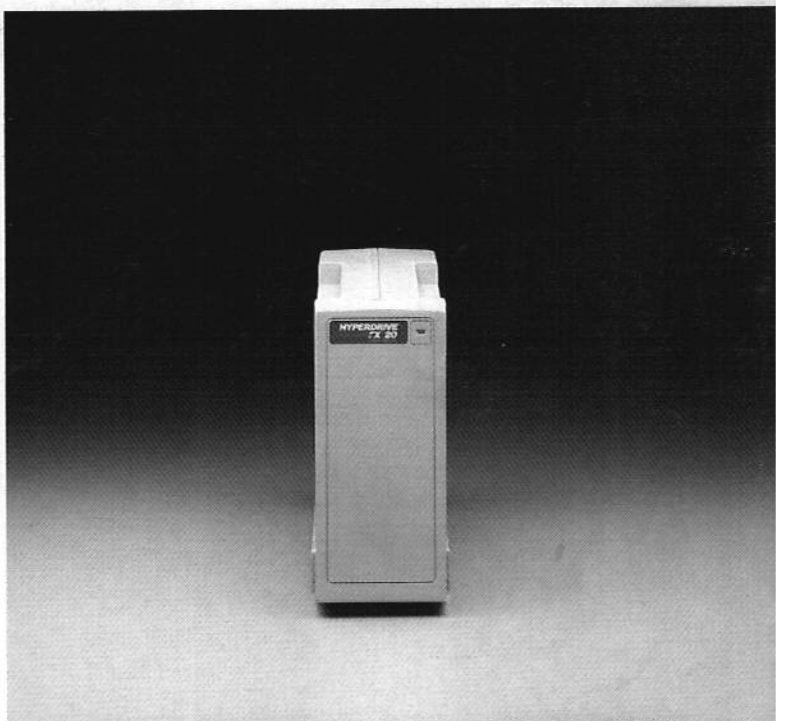

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When General Computer introduced HyperDrive, it set performance standards that remain unmatched by all but succeeding HyperDrives.

That's because HyperDrive was installed inside the Macintosh, where it connected directly to the microprocessor and was accompanied by software that made the most of this unique arrangement.

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HyperDrive FX/20 not only runs all software programs developed to Macintosh or Macintosh Plus standards; it runs them faster than any other external hard disk.

Plug it into the Mac Plus' SCSI port, and it will reduce power-up time by 66%. It will load Aldus' PageMaker over one and a half times as fast as a Mac Plus. And Microsoft's Excel two and a half times as fast.

But unlike other external disks, HyperDrive FX/20 brings both speed *and* sophistication to the management of information.

A program called Backup, for example, lets you quickly make back-up copies of files onto diskettes—and checks to make sure each copy matches its original.

A print spooler program lets you use your Mac for other documents even while your LaserWriter is still busy printing the one you just finished. And it reduces by up to 90% the time you might otherwise have to wait.

A security program protects your files from unauthorized entry. It scrambles data so that it's indecipherable to everyone who doesn't know the password you assign it.

The FX/20 also *stores* information intelligently. Its 20-megabyte capacity accommodates the data that would otherwise occupy up to 50 diskettes. Files are structured hierarchically. So your data is dynamically stored and retrieved, and you don't have to partition the hard disk.

In short, with the FX/20, as with the Macintosh itself, elegance is more than cosmetic; it is designed into the system, and measured by functionality rather than just appearance.

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HyperDrive FX/20 arrives with the paradoxical advantage of being both new and proven at the same time.

Its software has been proven on previous HyperDrives. And its overall reliability is perhaps best summed up in the fact that HyperDrive is the largest-selling Macintosh peripheral in the world.

So if you prefer an external hard disk, you no longer have to settle for performance beneath the standards of HyperDrive. And if you prefer an internal hard disk, that issue was resolved in favor of HyperDrive some time ago.

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