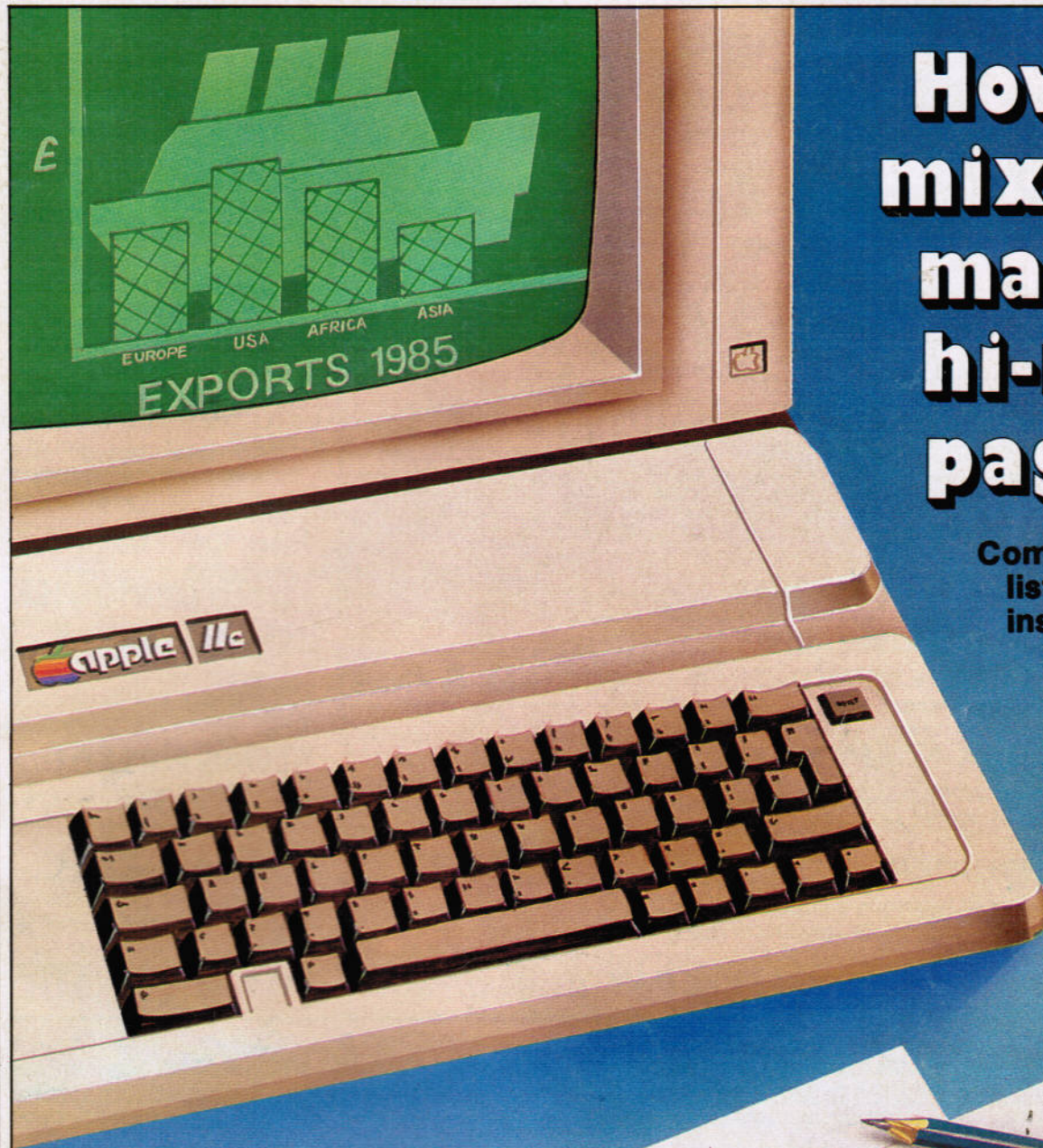




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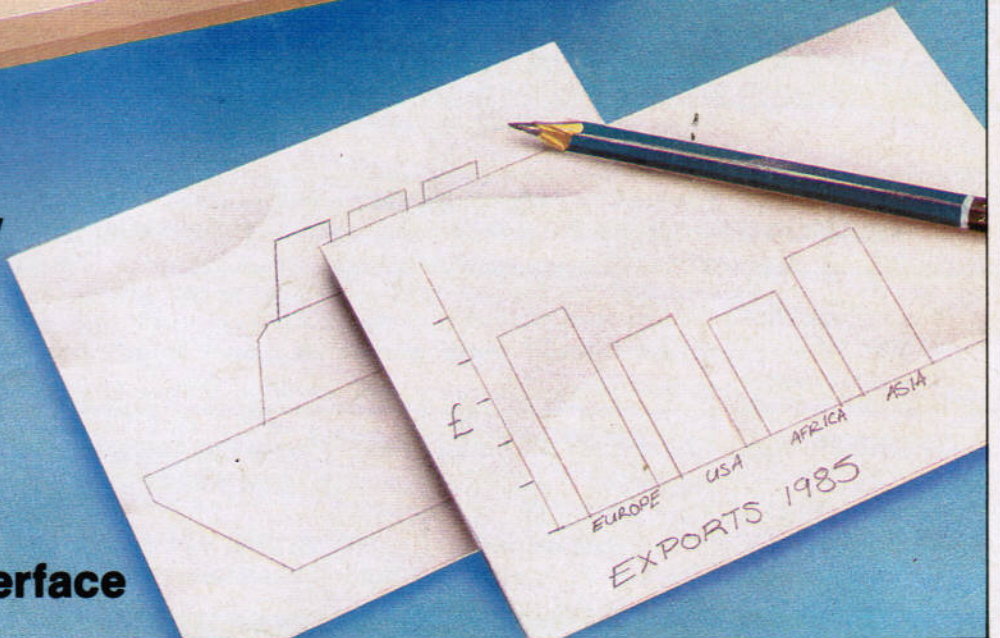
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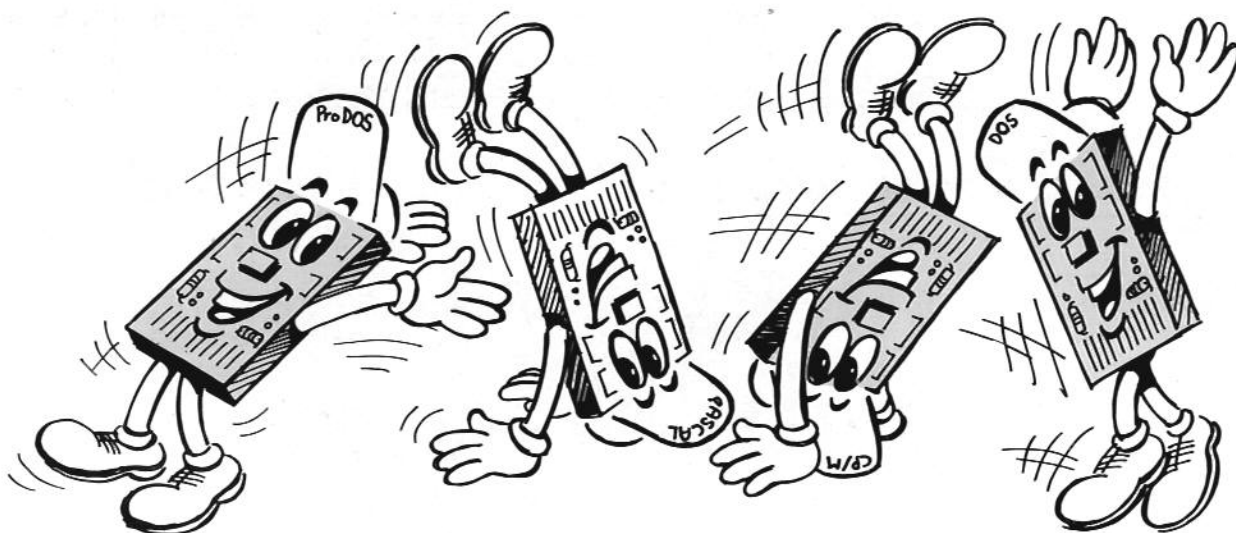
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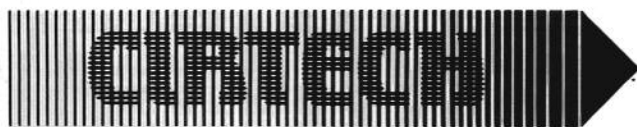
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By JOHN MacGIBBON
Apple User's New Zealand
correspondent

STEVE Wozniak, who less than a year ago made his much publicised exit from Apple Inc, now believes the company he co-founded is back in good shape.

"Things are in good hands now – technically and business-wise", he told members of New Zealand's Wellington Apple Users' Group.

Wozniak was speaking and answering questions during his second annual breakfast meeting with the 250 member organisation.

During his first visit to Wellington in 1984 he was extremely critical of the direction Apple was headed. In particular he objected to the cavalier way he believed the Apple II division was being treated.

But at the latest breakfast his attitude had swung practically full circle. The Apple II now enjoys much support throughout the company, Wozniak emphasised to his audience.

"Look at the recent peripherals that have come out – the megabyte memory card, 3.5 inch 800k disc drives, the printer in excellent shape. Everything's starting to come together", he said.

"The next real enhancements are more along the lines of increased memory, increased memory capability with a slightly different processor, a lot of co-processor thinking, the Apple II working into an

Wozniak gives Apple a vote of confidence



Steve Wozniak is presented with a Maori pendant during the Wellington Apple User Group's "Breakfast with Woz". Seated is Andy Hertzfeld

environment where another computer and software exists including IBM. Also more Amiga-like colour.

"John Sculley has put together the right management and key teams – ones who work well together and work in the interests of the company.

"He's done a very good job of planning our three major product lines – IIc, IIe and

Macintosh – and making them all play in balance. They're all doing well, all being enhanced and all being supported well.

"We'd been in a mode for quite a few years at the company where one product would be a personal favourite and would get all the attention and support while other products would be neglected. That's not the case currently".

Andy joins Jobs

FORMER backstage star at Apple Andy Hertzfeld has taken a part time job with the new company launched by Steve Jobs, the corporation's recently departed co-founder.

"Steve's a very, um, persuasive character, and he decided a few weeks ago he wanted some of the people who worked on Macintosh to work with him there", explained Hertzfeld.

"He was able to convince me it was an opportunity to make the next great computer. And that's what I want to do in my life – make better and better, greater and greater computers.

"It's a chance to see something really great, and as I say I don't like large companies, so working at Apple isn't an alternative for me".

Set for success in '86

APPLE expects profits world wide for the last three months of 1985 to be the highest of any quarter in the history of the company, although total sales for the festive season will be lower.

Net income is projected to be approximately £37 million.

"Apple Computer is healthy and strong", said president and chief executive officer John Sculley.

"Our gross margins will climb to the highest level in over three years and our cash

balance continues to increase.

"Our new product development efforts are right on track and we're investing heavily in our future with significant increases in research and development.

"Our management team is confident and capable, and our employees are motivated. Apple is well positioned for success in 1986".

Sculley said Apple's record earnings, which will be achieved despite lower sales than last year's holiday season, illustrate

the ability of the company to become significantly more profitable on flat revenues in fiscal year 1986.

He pointed to reductions in overhead, expense control throughout the company and conservative inventory management as major reasons for the higher gross margins and profits.

The previous record for quarterly profitability was established a year ago, when the company posted profits of £33 million.



Steve Wozniak... candid chat on Apples and Jobs

More than one Logo?

UK manufacturer Microsoft has dropped a clanger in its press statement announcing the release of its Logo language version for the Macintosh.

The company claims Microsoft Logo "is the only implementation of the language currently available" on the machine.

This must come as a surprise to at least one UK distributor, P&P Micros. It has been selling ExperLogo for the Macintosh for the past four months.

In fact this version of the language — from American company ExperTelligence — was released in December 1984 in the States.

Asked about ExperLogo, Microsoft's marketing spokesman Ann Murdoch said she had no knowledge of the rival.

"We worked very closely with Apple on our product and as far as we are both aware Microsoft Logo is the only Logo being marketed for the Macintosh".

THE Wellington Apple Users' Group was treated to another Steve Wozniak Show when the corporation's co-founder flew to New Zealand to be the guest at a champagne breakfast.

And *Apple User's* local correspondent, John MacGibbon, was on hand to report what he had to say.

Wozniak was generally less voluble in 1985 than he had been the previous year, but he did open up at great length on the subject of his former partner Steve Jobs:

"Steve Jobs — let's see — there was an episode occurred, and ah... a relatively interesting set of stories led up to it (laughter).

"Let me give you a little bit of a story... (more laughter).

"I had fallen in love with an idea for a really great product. I could obviously have got its development funded at Apple to any extent I wanted, just because of who I was.

"But if I ever developed a project like that in Apple — a hand held programmable remote control, nifty little thing — it would never become an Apple product.

"Every manager at Apple

Apple talk of the two Steves

said it wouldn't because it wasn't a computer and it didn't plug into a computer. If I did it at Apple, they would not put it out as their product, but meanwhile they would own it. And that the world could be deprived of it, was the risk.

"So I left and started my own company (Cloud Nine). But I was very up front. I went on the bulletin boards, drew pictures, showed everyone at Apple, right up to Sculley.

"I told Steve Jobs. I made sure everyone knew what I was doing, because you can't make it look like you were holding something back later. That will always come to haunt you".

Early in his new company's history Wozniak contracted a plastics design and moulding company to produce a case for his product. Then one Sunday Steve Jobs visited the company and saw drawings for the case.

When told what it was, Jobs "... apparently started throwing our models against the wall and then told them to package them up and send them to me and he'd pay for them. It's hard to understand why he did it.

"He stated publicly that it was because it was a product related to Apple's products, that I should not use a firm that Apple was using. Privately he said a lot of different things.

"We had it, of course in writing from Apple in the friendliest terms that it didn't relate to Apple's products. But publicly Steve Jobs took a stand that it was competitive or something.

"Well now he's kinda on the outs with Apple. Jobs brought Sculley on board a couple of years ago. And boy, Steve was his spiritual leader — Sculley's

inspiration as to the direction computers were going: what did they mean to the people, they would change our lives and in what way.

"And boy Sculley was just so happy. For about a year, everywhere Jobs went, Sculley was two feet away — six inches away.

"After about a year I started noticing at conferences that Jobs and Sculley would be on opposite sides of the room. There wasn't the same close-talking friendship. That link was no longer there.

"Steve would come up and start talking about something — a little humorous or jokey, even about the Pepsi Cola industry, but they just weren't on the same level — not together any more.

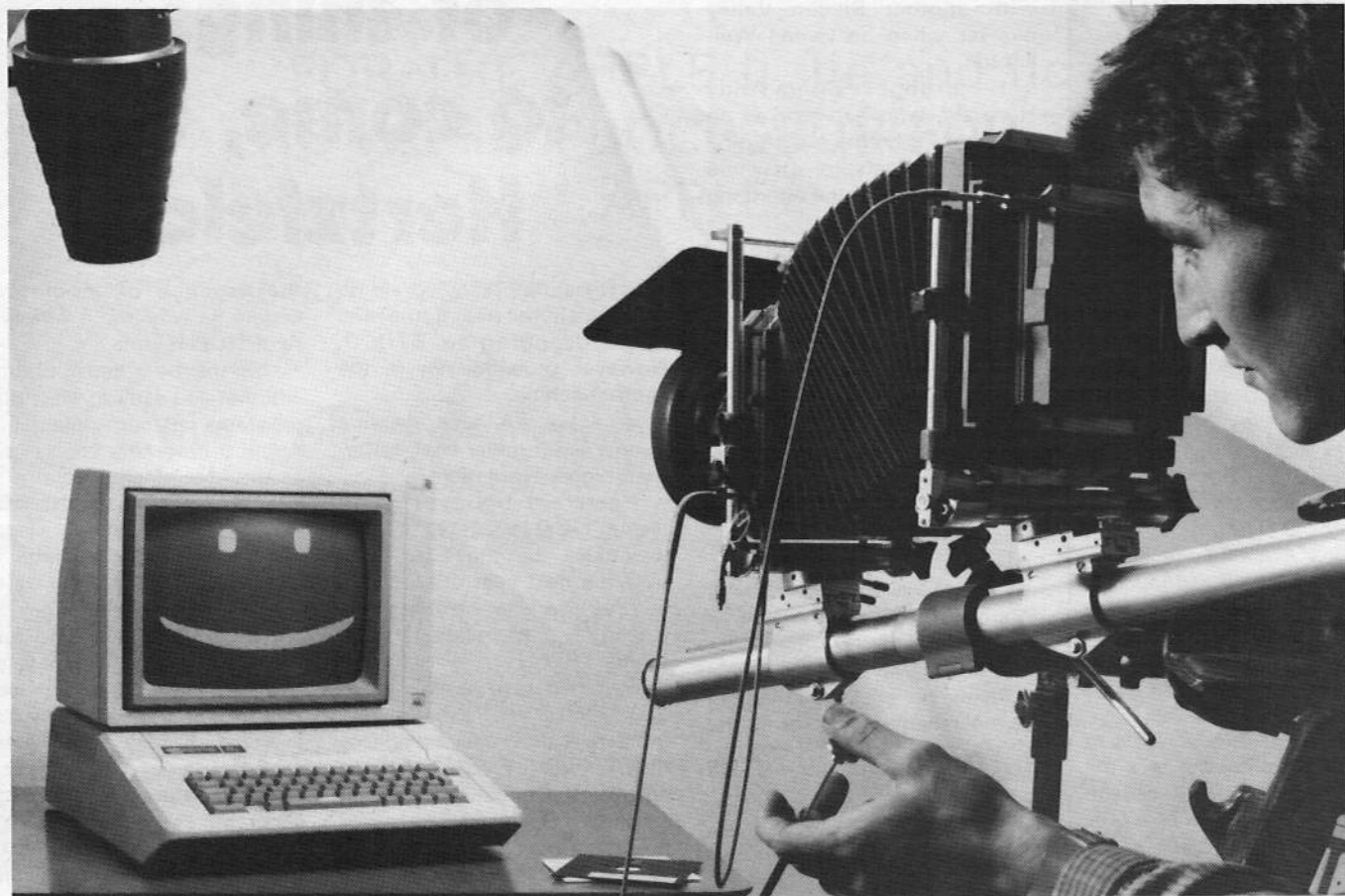
"Oddly enough, going 'round Sculley now, he's so happy. You can see it in his face. After what he's gone through in the last couple of months a lot of people thought 'Boy he might just want to get away from Apple and might just regret that he ever came out here, although he's got a lot from it'. I think he's really delighted how things are going now.

"In the meantime Steve decided to go off and start this company. I can't really talk too much of what I know regarding discussions at different levels with different people, because it's in litigation".

The two former partners have not severed all communications.

"Steve Jobs called me up one night and thanked me because I said on a TV interview that whatever he builds will be so great it'll improve my life and I'll go and buy one".

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



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

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

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The Amiga? It's great —for games

HERTZFELD has a Commodore Amiga, but while he thinks it has great potential as a games machine, he is less enamoured of it as a general computer.

"It's kinda like a colour Mac in that it has the same processor. But the Amiga in some sense is more like the Apple II, because it is built around the NTSC television standard", he said.

"It has the limitations of NTSC. It will never have the clarity of display or the number of pixels that a Mac has. In the interlace mode the Amiga flickers terribly. It's not useful as an office type machine because of that.

"I also think the Amiga software is very very bad. We spent several years, many years, tweaking Mac's software. It went through many evolutionary states, refining it.

"Whereas the Amiga, I think, doesn't really believe in the user interface. They just sort of sugar coated it all at the last minute to try to make it seem like a Macintosh.

"Yet I hope the Amiga succeeds. It's the greatest game machine, and I love playing games".

Hertzfeld is not impressed by Digital Research's Gem product. "It's poorly implemented. The screen looks the same (as the Macintosh), but when you start using it you see the dynamic behaviour is quite different. Things don't work like they should. I am biased of course, but... it really is shallow".

APPLE'S co-founder Steve Wozniak shared centre stage with another Silicon Valley pioneer when he visited Wellington.

He brought along Andy Hertzfeld, who had worked on the Apple II before transferring to the Macintosh project, where he wrote much of the operating software.

Now working independently of Apple, he is best known for his Switcher software for the Macintosh and the Thunderscan Digitiser.

He went on to tell his audience of an esoteric use for Thunderscan.

"A botanist at the University of California at Berkeley is using Thunderscan to take very precise measurements of the veins and capillaries in leaves.

"Previously he had to use a microscope to get measurements down to 200ths of an inch or so. Very tedious.

"Now he sticks the leaf in Thunderscan and scans it. He wrote his own program to analyse the image and extract the information automatically, something I never would have thought of.

"Something that is wonderful about Apple II and Macintosh products is that everything is magnified by the creativity of the world.

"The hardware is only the start. The tens of thousands of people who are using it are always going to come up with amazing things you've never thought of yourself".

Just how amazing the former Apple boffin attempted to explain to his enthusiastic New Zealand audience in a wide ranging examination of the Apple world.

Hertzfeld revealed his buddy Bill Budge is working on Macintosh software and on a space shuttle simulation for the Mac with true shaded details.

"He's also done his Pinball Construction Set for the Mac, and his ultimate goal in life is to write a construction set construction set!"

Hertzfeld described two directions being pursued by manufacturers, greater resolution than the present 300 dots per inch available on the LaserWriter, and lower cost. He

Hi-res shape of things to come, by Hertzfeld

sees resolution moving up to 1000 dpi in the near future, and costs dropping to \$1000. However probably not in the same machine.

Wozniak believes Apple's priority is for lower cost, rather than higher resolution.

Hertzfeld believes page layout programs have a long way to go, "but they'll get there over the next year or so. What you see now is only the tip of the iceberg — Pagemaker is rudimentary".

Hertzfeld says Apple's move to 3.5 inch drives for the Apple II family will allow easy transfer of files between those machines and the Macintosh.

"Apple is working on utility programs that will allow you to stick a Macintosh disc in your Apple II and convert files to ProDos very easily — and vice versa. That media compatibility

'Mac's future very healthy'

is an important step in linking the two machines", Hertzfeld said.

"There are some other quite strange products. One actually transforms Apple II programs into Macintosh programs.

"That was a very very difficult problem. The guy's got special hardware in the Apple II that's reading DOS references and stuff.

"The problem is that you have to run the Apple II programs through every stage you can possibly get to. You have to execute every instruction to translate the program completely. It can't work in each case — it's too hard a problem.

"The other thing you're now seeing is the Macintosh spirit,

the essence of Macintosh, finding its way into a variety of Apple II programs.

"So maybe it doesn't matter whether you can run Macintosh programs on your Apple II if the Apple II programs are as good as the Macintosh programs".

Both Wozniak and Hertzfeld use Hyperdrive and consider it the best hard disc available for the Mac. However Hertzfeld points out that while they are the best performers and have the best software, they are relatively expensive for what they deliver, and being internally installed, if they break down, your Mac is out of commission.

Mac's future is very healthy, according to Hertzfeld. "You can learn a lesson from the Apple II. Computers are unlike consumer-oriented products like calculators and watches, which have a limited lifespan.

"Computers are different because they are a foundation. They're not a product — they're open-ended, totally customisable by software.

"A computer has to be around a few years before it reaches the prime of its life. I still think Mac is kinda like where the Apple II was in 1979, when Visicalc hadn't yet come out for it".

The Macintosh's potential as a music synthesiser was well demonstrated by a just-released program from Hayden Software called Jam Session, he said.

Mac's screen shows a ghetto blaster in great detail — even down to needles waving on individual VU meters for the six separate recording tracks.

Jam Session's sound is amazingly realistic, and a clever feature is the ability to write a melody and then tell the Mac what style you want it played in — jazz, reggae, acid rock and so on.



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When you need some dynamic memory

MOST languages provide the programmer with static allocation of memory. For example, in Basic the statement DIM A(50) will reserve storage for an array of 50 elements. Storage for simple variables is assigned automatically, so that the first time the variable TAX is used, space is reserved for it in memory.

In Pascal, all variables must be declared, that is described in a Var statement before they are used. Variables used like this are said to be static, that is they have a lifetime which is as long as the lifetime of the program or procedure in which they are declared – remember that when a procedure is exited, its local variables are lost.

However there are some programming applications which require the dynamic allocation of memory. In particular, there are times when the programmer will not know how much data is to be stored, and hence cannot declare the variables to store the data. The storage space can only be allocated as the data is examined, hence storage allocation is said to be dynamic.

This technique is best understood by reference to a very simple problem, that of inputting a sequence of numbers and outputting them in reverse order. We could use an array, but would not know how long it might be. Furthermore, over-generous static declaration of the storage area might demand much more storage than is available. It would be much better to allocate memory when the data is being read in.

Dynamic variables are created as the program is executed. Associated with each dynamic variable is a pointer to that variable. The dynamic variable is always accessed by using this pointer variable, which is stored as a normal static variable. Figure I might make things a little clearer.

Dynamic variables may be of any type, so that they can themselves be records which contain pointers to other dynamic variables. We can then use this facility to create a linked list of values. Each value has associated with it a pointer to the next value. Figure II illustrates this – the dynamic record used consists of two fields, a data value and a pointer. We use a static variable as a pointer to the start of the chain.

Now think back to the list reversing problem that I introduced earlier. By storing each item in a record, together with a pointer to the next item, we shall produce our list. If we add to the front of the list – the left-hand end in Figure II – and remove from that same end, items will be removed in reverse order.

Enough of the theory, now let's get down to the Pascal. To use a list like that in Figure II we need to define the record structure in a type statement. We need also to define the pointer to the start of the list. Our type statements will look like this:

```

type
    point = ^entry;
    entry = record
        value:integer;
        next :point
    end;

```

We have said earlier that dynamic variables are created during the execution of a program. To do this we need to declare a variable as a pointer to the record. In the type statements above, 'point' has been declared as being of type pointer to entry, when entry is a record containing data and another pointer. We shall need the following variables:

```

var
    rec,first:point;

```

The variable 'rec' is a pointer to the dynamic variable – we use it to access each record. The variable 'first' will point to the start of the list, while rec points to the current record. To create a new record, we write:

```

new(rec);

```

```

program revlist;
type point = ^entry;
    entry = record
        value : integer;
        next : point
    end;
var
    x:integer;
    first,
    rec:point;
begin
    first:=nil; (* set first pointer to NIL *)
    readln(x); (* input first number to be stored *)
    while x <> 0 do
    begin
        new(rec); (* allocate space for new variable *)
        rec^.value:=x; (* put new number into newly allocated variable *)
        rec^.next:=first; (* make new pointer point where first did point *)
        first:=rec; (* make 'first' pointer point to new entry *)
        readln(x) (* get next number to be added to list *)
    end;
    (* entry complete: now output the list in reverse order *)
    rec:=first; (* start at first entry *)
    while rec <> nil do
    begin
        writeln(rec^.value); (* output value pointed to *)
        rec:=rec^.next (* move onto next record *)
    end
end.

```

Listing I

This creates space in a data area called the heap for a dynamic variable which *rec* points to, that is it makes space for one entry, and sets the new *rec* so that it points to that space. To access the value in the new dynamic variable of type *entry* we refer to *rec^.value*, by which we mean the value field in the record pointed to by *rec*. The pointer in the record is accessed by *rec^.next*. Figure III should make this a bit clearer.

Back to the list reversing problem again. As each number is input the program must create a new record to hold the number. The value in that record will be the number just input and the next pointer will point to the previous record. The first variable will always point to the last record created.

Figure IV shows the building up of the linked list as the numbers 4, 54 and -6 are input. The listing of the numbers in reverse order is trivial, as the program simply has to work down the chain of pointers. The complete program is given in Listing I.

There is one problem with this kind of use of dynamic variables – the inefficient use of memory space. The memory used by the various records in the list is permanently assigned and cannot be re-used to hold other information. We need the opposite of the new statement, one which gets rid of unwanted dynamic variables returning them to the heap.

First the good news. Standard Pascal provides us with just this, a *dispose* statement. Now the bad news, Apple Pascal doesn't allow us to use *dispose*. What it does provide are *Mark* and *Release* procedures which can be used together to remove whole chunks of data off the heap.

Apple Pascal implements its heap area almost like a stack. (One UCSD Pascal expert has called it a *steap*!). The *Mark* procedure makes a note of the pointer to the top of the heap and stores it in the parameter to the procedure. A later *Release*

procedure will reset the pointer to the top of the heap, effectively throwing away all dynamic variables created since the *Mark* was performed.

The parameters to these procedures are declared as pointers, usually to integers, so that the following code would be used to regain heap space after it is no longer needed:

```

var    heapsize:^integer;

begin
  mark(heapsize);    (* make a note of top of heap *)

  (* code here which creates dynamic variables
     on the heap. When they are no longer required,
     we use: *)

  release(heapsize); (* reset top-of-heap pointer to
                       original value. *)

  (* code which may re-use the same heap area *)

end.

```

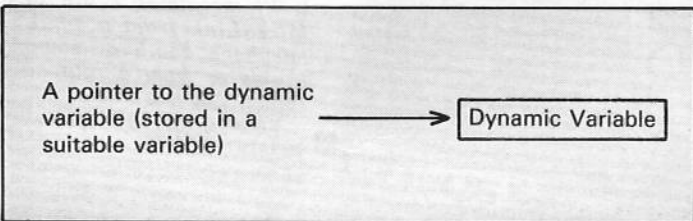


Figure I

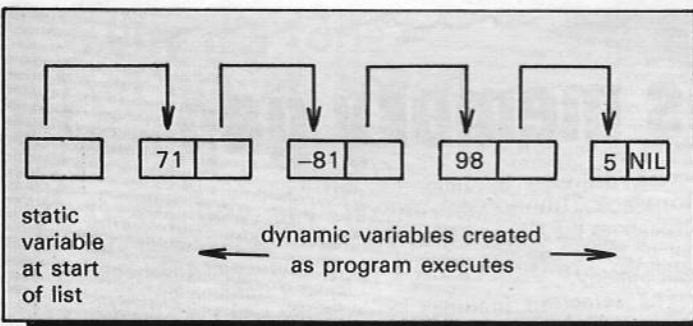


Figure II

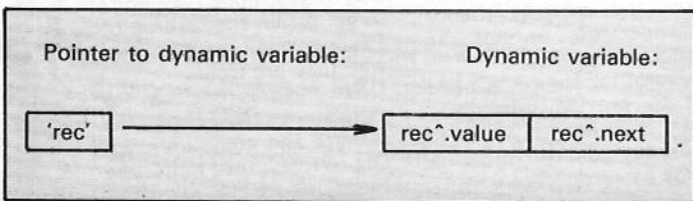


Figure III

By using several variables of type *^integer*, note of the top of heap can be made at various points in a program, and releases done to different points on the heap. However note that it is the responsibility of the programmer to ensure that only sensible operations are done. Note the warning on page 47 of the language manual about "dangling pointers".

● Next month we shall look further into dynamic memory allocation, examining slightly more complex applications.

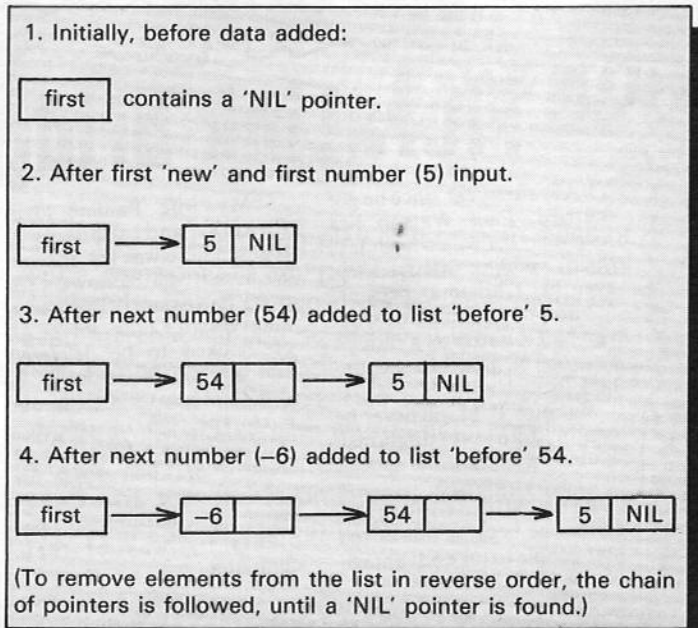


Figure IV

NEWSLETTER

Never a wrong note

THE European Community Chamber Orchestra is nearing the end of its busiest ever year, and MicroLink has been helping to ensure the group is as efficiently organised as it is artistically gifted.

And that's a big job – the orchestra has fulfilled a schedule of 60 concerts in the last 12 months, including the opening concert of Europe Music Year and tours of Holland, Germany, France, Belgium, Great Britain and Italy.

On top of all this the orchestra has released its first record, *The Symphony in Europe*, and has made two more recordings with Rudolf Barshai.

Fortunately the orchestra's artistic director Ambrose Miller is a MicroLink subscriber and is able to use the telex facility to keep in contact with agents on the continent.

Wide awake at weekends

ONE of the many drawbacks to traditional mail is that you can access it effectively only five and a half days a week.

If you have a letter that must be delivered on Monday you have to get it into your neighbourhood pillar box before midday on Saturday.

Otherwise you might as well tear it up as it won't be

collected for nearly two more days.

For threequarters of the weekend pillar boxes are about as useful as chocolate teapots. Unless you're prepared to travel miles to a major sorting office you've no chance of getting your letter into the system.

However MicroLink subscribers can not only ensure

first post Monday morning delivery of letters composed during the weekend – they can take their time writing them.

MicroLink's Telemessage service is open right up to 6pm on Sunday for guaranteed next day delivery at a cost of only £1.25 for up to 350 words. And to any address in the UK or USA.

Prime service

MICROLINK'S host network, Telecom Gold, has been forced to add one of the world's most powerful computers to its system in order to cope with the increase in demand for electronic mail.

The Prime 9955 costs close to £500,000, is capable of handling up to 256 terminals at any one time and has 16mbyte of memory.

Hot line to Japan

IT can get more than a little chilly in Japan at certain times of the year.

But the wife of the editor of a Japanese magazine won't be feeling the cold for some time – thanks to MicroLink Telemessages.

For her husband has just used the service to order her some of the finest cashmere sweaters from an exclusive boutique in the plush Burlington Arcade, London.

Yuichi Ishikawa edits the

4 x 4 Magazine of Japan and is a MicroLink enthusiastic, using it regularly to keep in touch with an associate company in Bristol.

"Sometimes I tap to MicroLink from a small telephone booth at countryside or from a railroad station", he told MicroLink.

"But besides my business, I think better communications mean a better world". And obviously a happier wife.

FloraLink bridges memory gap

YEAR after year since he got married, Paul Watson has forgotten his wife's birthday, their wedding anniversary, even her Christmas present.

"So you can imagine what I've had to suffer as a result", says the 40-year-old accountant from Hull.

But now Paul will never be confined to the doghouse again for missing the special occasions.

As a MicroLink subscriber he became one of the first people to take advantage of the FloraLink service.

"My wife Pauline loves flowers, and suddenly I realised here was the answer. So now it will be flowers for every occasion – birthdays, anniversaries, the lot – all pre-booked to be delivered annually via FloraLink".

MicroLink joined forces with the world famous delivery service Interflora to create FloraLink, which for the first time ever enables people to send flowers or pot plants by way of their computer.

With 24 hours a day open

access, deliveries by Interflora's 2,700 members throughout the UK and Eire can be made any day other than Sunday.

The selection includes freshly cut flowers, bouquets, wreaths and sprays and potted plants – all manner of sizes and specially shaped arrangements to suit the customer's pocket.

FloraLink carries a price list to provide subscribers with a guide to what is available and payment is made by credit card.

"It couldn't be simpler", says Paul Watson, "and what appealed particularly to me of course was to be able to leave a standing order."

"So this year I've gone the whole way. I've even ordered some flowers for Valentine's Day. I just hope they don't forget to put the card in, or Pauline won't have a clue who they are from."

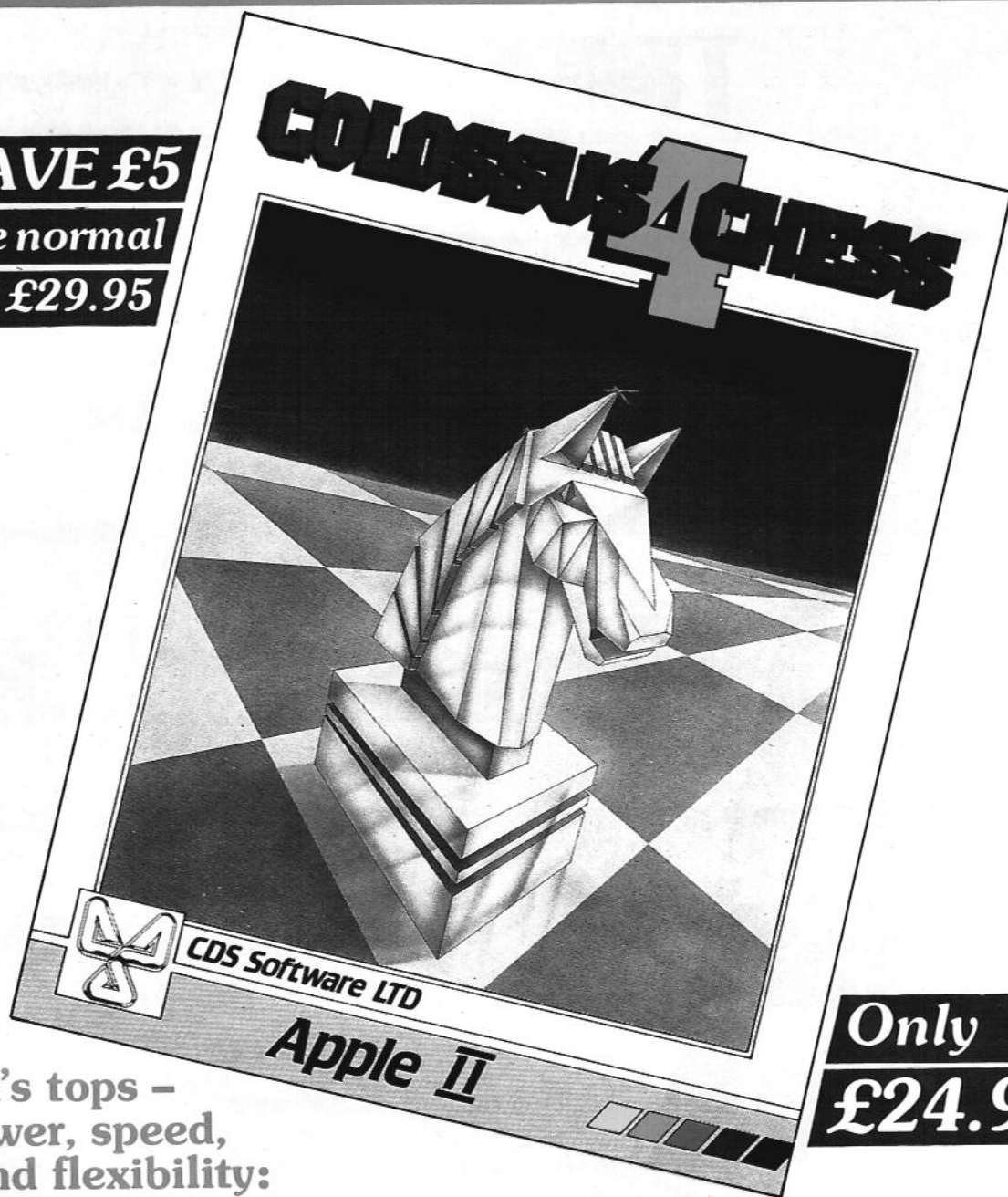
"If there is one way to extricate yourself from the manure and come up smelling of roses, then it must be FloraLink for me".

YOUR chance to join MicroLink – Page 50

Apple user
SPECIAL OFFER

It's the most outstanding chess
program ever written for the Apple II!

SAVE £5
on the normal
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Why it's tops –
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Power: In a series of 16 game matches, Colossus Chess 4 has defeated 24 other chess programs – the results varying from 10-6 to 16-0 in Colossus' favour.

Speed: The average number of moves examined per second is 300 with the program working from 2 to 17 ply ahead.

Size: There is 22k of machine code program driving Colossus 4, with 5k of data and a "book" of over 3,000 opening moves on the disk.

Flexibility: Besides having an infinite number of levels, to suit both the beginner and the expert, Colossus 4 is far more flexible than any credit

card! The program can play one or both sides of a game, swapping at any point in the game. It can display the board in two or three dimensions or even invisibly – if you so desire. It will give you a hint at anytime – just ask. You can even backtrack to correct your mistakes. Two full feature chess clocks are available with tournament and five other modes. So many features that it takes the programs author, Martin Bryant, 28 densely packed pages to explain them all.

Order form on Page 61

Here's

IBM, Epson QX-1

Acorn Electron, ACT

Ericsson...and t

that fits them all-the

At last, your computer can have an Epson printer.

Even if it's only supposed to be compatible with 'own brand' printers (like Atari).

Our latest printer, the GX-80, has a revolutionary new interface called PIC (it means Printer Interface Cartridge and that's it on the right). The cartridge slips into the back of the GX-80 and enables the GX to understand commands from the host computer.

So if you've ever wanted to have an Epson printer for your micro but thought you couldn't, here it is.

But first, read about the GX-80's other cracking advantages . . .

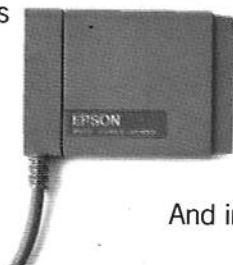
What happens when I change computers?

Gone are the days when you had to scrap a perfectly good printer just because it 'didn't go with' your new computer.

Once bought, your GX-80 stays put. (Epsons tend to stick around for ages anyway; now we've taken tradition a little further.)

When the time comes to upgrade your computer, you simply go back to your Epson dealer and buy the corresponding new PIC.

It's a far sight cheaper than being forced to sell/scrap out your printer only to buy another one. And in effect it makes the GX-80 your printer for life.



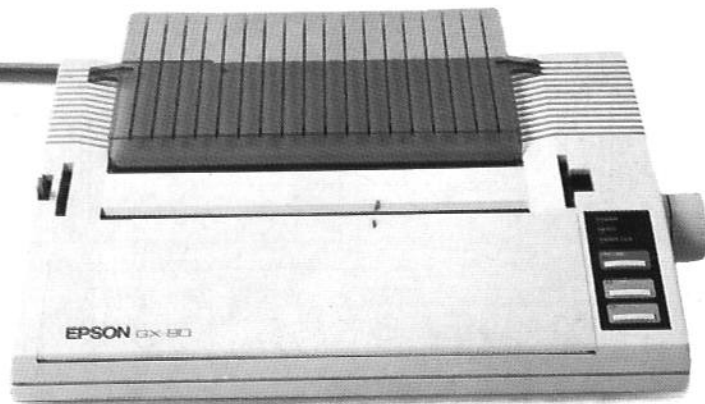
a plug for any Atari,

6, Apple IIc, BBC,

Sirius/Apricot, Compaq,

this is the printer

new Epson GX-80.



A printer for life? What's the catch?

Sheer, unremitting boredom.

The GX-80 takes all the fun out of printer ownership. You can't shout, "Lousy printer! It's fouled up again!" because it won't. It's just as reliable as every other Epson.

Nor can you gleefully chuck it merely because you've changed computers — PIC's seen to that.

But all is not lost. You could change your computer a bit more often. Just for fun.

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*Please leave blank if inapplicable.

KPA 2

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VISA

EVER wanted to load one hi-res picture on top of another? Then Hi-Res Overlayer could be the answer.

A small machine code routine is used to logically OR, EOR or AND the pictures together and display the composite result on either hi-res screen HGR1 or HGR2.

The Basic program is menu driven and allows you to decide which screen to use, or whether to clear a particular screen, or to load or save a screen to disc. You can also toggle between HGR1, HGR2 or text screens with a single keystroke, and most importantly, merge two pictures together.

Listing I shows the machine code OVERLAY routine. It is initially set up to use HGR1 (\$2000-\$3FFF) and logically OR the data. This set-up can be changed from within the Basic program.

Referring to the assembly listing, Listing I, lines 14 to 20 load the SOURCE address and the TARGET address into spare locations in Zero Page which is used because of the type of addressing when merging the screens.

This type of addressing is called post-indexed (indirect) addressing and requires that the start address for each table is stored in Zero Page. The four addresses, \$F9 to \$FC inclusive, are used because they are not overwritten by Basic or the system monitor.

There is, however, still a problem with addressing as the hi-res screens are 8k long. In this addressing mode the Y register is used to increment the screen address, and therefore only 256 bytes can be addressed before overflow in the Y register occurs.

This means that the SOURCE and TARGET addresses have to be incremented and restored into Zero Page.

This is done by the subroutine RESET (lines 29 to 37). The X register is loaded with the most significant byte (MSB) of the SOURCE address, initially HGR1. It is then incremented and checked to see if the end of the screen is reached - \$4000. If not, the MSB is stored out and the TARGET MSB is loaded, incremented and stored.



Hi-Res overlayer

Display composite graphics with this routine
by JOHN and DARRELL PHILLIPS

The subroutine BEGIN, lines 22 to 28, merges the data and then stores the composite byte out at the SOURCE address.

The Y register is incremented for the next byte and this continues until overflow occurs, then the RESET routine is called.

If overflow does not occur it jumps back to line 23 and continues with the next byte.

Listing II shows a hexadecimal dump of the OVERLAY routine. To save time when typing the program in enter the dump at address \$300. Then enter Basic and type BSAVE OVERLAY.OBJ0,A\$300,L\$30.

Listing III is the Basic program. Line 10 ONERR GOTO, should only be typed into the program when you are happy that the rest of the

program is working correctly.

Lines 20 to 180 BLOAD the machine code and display the main menu.

Lines 190 to 250 enable the user to CATALOG the disc in drive 1.

Lines 260 to 330 delete a picture file from the disc in drive 1.

Lines 340 to 440 allow the user to save to disc either hi-res screen.

Lines 450 to 530 soft screen switches for HGR1, HGR2 and the main menu.

Lines 560 to 740 is the merge routine. It allows either hi-res screen to be cleared. Picture files can then be logically OR, EOR or ANDed on to either screen.

Note that if the picture file is ANDed on to a blank screen the

resultant picture will be blank, as only white is recognised as a logic 1 and all other colours are logic 0.

Line 650 sets the SOURCE address to HGR2.

Line 660 resets the SOURCE Address to HGR1.

Line 690 alters the machine code so that the data can be ANDed.

Line 700 resets the machine code to the OR condition.

Line 710 allows the data to be Exclusively ORed.

Line 730 calls the machine code routine.

Lines 750 to 820 allows either screen to be dumped to a printer. You must enter the control commands for your printer, as a string followed by Return, when prompted to do so in the program.

Listing I

```

SOURCE FILE: OVERLAY
0000:      1 #####
0000:      2 # # # # #
0000:      3 # HIRES OVERLAY #
0000:      4 # # # # #
0000:      5 # # # # #
0000:      6 # # # # #
0000:      7 #####
----- NEXT OBJECT FILE NAME IS OVERLAY.OBJ0
0300:      8                                ORG $0300
00F9:      9 SOURCEL EQU $00F9
00FA:     10 SOURCEH EQU $00FA
00FB:     11 TARGETL EQU $00FB
00FC:     12 TARGETH EQU $00FC
0300:     13 #####
0300:A9 20 14
0302:85 FA 15
0304:A9 00 16
0306:85 F9 17
0308:A9 60 18
030A:85 FC 19
030C:A9 00 20
030E:85 FB 21
0310:A0 00 22 BEGIN
0312:B1 F9 23
0314:11 FB 24
0316:91 F9 25
0318:08 26
0319:F0 03 27
031B:4C 12 03 28
031E:A6 FA 29 RESET
0320:E8 30
0321:E0 40 31
0323:F0 0A 32
0325:86 FA 33
0327:A6 FC 34
0329:E8 35
032A:86 FC 36
032C:4C 10 03 37
032F:60 38 END
*** SUCCESSFUL ASSEMBLY: NO ERRORS

```

Listing II

```

0300- A9 20 85 FA A9 00 85 F9
0308- A9 60 85 FC A9 00 85 FB
0310- A0 00 B1 F9 11 FB 91 F9
0318- C8 F0 03 4C 12 03 A6 FA
0320- EB E0 40 F0 0A 86 FA A6
0328- FC EB 86 FC 4C 10 03 60
0330- 00

```

Listing III

```

10 ONERR GOTO 100
20 D$ = CHR$ (4)
30 TEXT : HOME
40 VTAB 12: PRINT "LOADING
OVERLAYER"
50 PRINT D$;"BLOAD
OVERLAY.OBJ0"
60 HTAB 12: PRINT "HI-RES
OVERLAY": POKE 34,3
70 FOR D = 1 TO 2500: NEXT
D: TEXT : HOME
80 VTAB 10: PRINT " THIS
PROGRAM SUPERIMPOSES ONE
": PRINT "HI-RES PICTURE
ONTO ANOTHER."
90 FOR D = 1 TO 1500: NEXT
D
100 HOME
110 VTAB 10: PRINT "PRESS
'1' CATALOG": PRINT "
'2' DELETE A PIC. FILE"
120 PRINT " '3' SAVE
PIC. TO DISK": PRINT "
'4' SWITCH TO HGR 1":
PRINT " '5' SWITCH
TO HGR 2"

```

```

LDA #$20 :LOAD MAIN
STA SOURCEH ;PIC ADDR.
LDA #$00 ;INT0 ZERO
STA SOURCEL ;PAGE.
LDA #$60 ;LD OVERLY
STA TARGETH ;PIC ADDR.
LDA #$00 ;INT0 ZERO
STA TARGETL ;PAGE.
LDY #$00
LDA (SOURCEL),Y ;MAIN PIC BIT
ORA (TARGETL),Y ;WITH OVRLY BIT
STA (SOURCEL),Y ;BIT AS MAIN
INX
BEQ RESET
JMP BEGIN+2
LDX SOURCEH ;LD MSB OF ADDR.
INX
CPX #$40 ;END OF SCREEN
BEQ END ;IF YES END
STX SOURCEH ;STR MSB OF ADDR.
LDX TARGETH ;LD MSB OF ADDR.
INX
STX TARGETH ;STR MSB OF ADDR.
JMP BEGIN
RTS

```


AppleTip

i On re-running a Basic program under DOS all variables from the last run are CLEARED. Where these variables take a long time to calculate this can be a nuisance.

It may often be overcome by issuing an immediate-

mode GOTO command to the section of the program beyond the variable-calculation stage.

This will leave all variables intact and save unnecessary delay, provided that the program has not been altered since the previous run.

It can also be used to restart a program interrupted by the user, being far more reliable than the fickle CONT command.

Similarly, GOSUB may be used in immediate mode to test a particular subroutine in isolation if its variables have

been correctly set. When a Return is encountered the program ends and control is returned to the user.

Under ProDOS the variables can also be STORED to disc and RESTORED, which with the /RAM emulation is very fast. **Gerard Manning**



```

130 PRINT " '6' SWITCH
    TO TEXT SCREEN": PRINT "
    '7' LOAD OR SUPERIMPOSE
    PICTURES"
140 PRINT " '8' DUMP
    PIC. TO PRINTER": PRINT "
    '9' QUIT"
150 PRINT : PRINT "ENTER
    OPTION "; GET A$: IF A$
    < CHR$ (49) OR A$ >
    CHR$ (57) GOTO 100
160 A = VAL (A$)
170 ON A GOSUB
    190,260,340,450,480,510,54
    0,750,830
180 GOTO 100
190 TEXT : HOME
200 INVERSE : PRINT
    "CATALOG": NORMAL
210 D$ = CHR$ (4)
220 PRINT D$;"CATALOG"
230 PRINT : PRINT
240 PRINT "PRESS ANY KEY
    "; GET Q$
250 RETURN
260 PRINT "DELETE "
270 TEXT
280 HOME : INVERSE : PRINT
    "DELETE": NORMAL
290 VTAB 13: PRINT "(IF
    NONE PRESS RETURN)"
300 VTAB 12: INPUT "ENTER
    FILE TO BE DELETED ";N$
310 IF N$ = "" THEN RETURN
320 PRINT D$;"DELETE ";N$
330 RETURN
340 PRINT "SAVE"
350 TEXT
360 HOME : INVERSE : PRINT
    "SAVE": NORMAL
370 VTAB 10: INPUT "WHICH
    HI-RES SCREEN IS PIC (1
    OR 2) ";B
380 IF B < 1 OR B > 2 THEN
    GOTO 370
390 VTAB 13: PRINT "(IF
    NONE PRESS RETURN)"
400 VTAB 12: INPUT "ENTER
    PICTURES NAME ";N$
410 IF N$ = "" THEN RETURN
420 IF B = 1 THEN PRINT
    D$;"BSAVE
    ";N$";A$2000,L$1FFF"
430 IF B = 2 THEN PRINT
    D$;"BSAVE
    ";N$";A$4000,L$1FFF"
440 RETURN
450 REM HGR 1
460 POKE - 16304,0: POKE
    - 16302,0: POKE -
    16300,0: POKE - 16297,0
470 RETURN
480 REM HGR 2
490 POKE - 16304,0: POKE
    - 16302,0: POKE -
    16299,0: POKE - 16297,0
500 RETURN
510 REM TEXT SCREEN
520 TEXT
530 RETURN
540 PRINT "MERGE"
550 TEXT
560 HOME : INVERSE : PRINT
    "MERGE": NORMAL
570 PRINT : PRINT "CLEAR
    HI-RES SCREEN (Y/N) ";
    GET Y$: IF Y$ = "N" THEN
    GOTO 610
580 PRINT : PRINT : PRINT
    "CLEAR WHICH SCREEN 1 OR
    2 "; GET W: PRINT
590 IF W = 1 THEN HGR :
    GOSUB 510
600 IF W = 2 THEN HGR2 :
    GOSUB 510
610 HTAB 1: VTAB 12: PRINT
    "(IF NONE PRESS RETURN)"
620 VTAB 12: INPUT "ENTER
    THE NAME OF PICTURE ";B$
630 IF B$ = "" THEN RETURN
640 VTAB 15: INPUT "LOAD TO
    WHICH SCREEN 1 OR 2 ";W$:
    IF W$ < "1" OR W$ > "2"
    THEN GOTO 640
650 IF W$ = "2" THEN POKE
    769,64: POKE 802,96: GOTO
    670
660 POKE 769,32: POKE
    802,64
670 D$ = CHR$ (4)
680 PRINT : INPUT
    "AND,OR,EOR THE PICTURE
    A/O/E ";L$
690 IF L$ = "A" THEN POKE
    788,49
700 IF L$ = "O" THEN POKE
    788,17
710 IF L$ = "E" THEN POKE
    788,81
720 PRINT D$;"BLOAD
    ";B$";A$6000"
730 CALL 768
740 RETURN
750 PRINT "PRINT"
760 TEXT
770 HOME : INVERSE : PRINT
    "PRINT": NORMAL
780 INVERSE : VTAB 19:
    PRINT "NOTE ": NORMAL
790 PRINT "THE CONTROL CODE
    MUST ALSO INCLUDE": PRINT
    "THE HI-RES PAGE
    REQUIRED."
800 VTAB 12: INPUT "ENTER
    CONTROL CODES FOR YOUR
    PRINTER";C$
810 PR# 1: PRINT C$: PR# 0
820 RETURN
830 POKE 34,0: TEXT : HOME
    : PRINT "HAVE A NICE
    DAY": END
840 REM
    *****
850 REM *
    *
860 REM * J & D PHILLIPS
    *
870 REM * 1985
    *
880 REM *
    *
890 REM
    *****

```

i Sometimes I get annoyed with the flashing cursor on the Apple and I have always wanted a solid inverse cursor for a change.

So Listing I is a short machine language routine that will do just that when using DOS if you don't have a language card. (If you do have a language card see the Appletip from Azwan Khan on Page 19 of the May 1984 issue.)

The Basic version is shown in Listing II.

Pressing Reset will bring back the normal cursor, but the inverse cursor can be invoke any time with CALL 768.

Under ProDOS, when Azwan's method won't work, the basic version is as shown in Listing III.

Edmund Long

Listing I

```

0300- A9 0B 85 38 A9 03 85 39
0300- 4C EA 03 48 29 3F 09 00
0310- 91 28 68 E6 4E D0 02 E6
0310- 4F 2C 00 C0 10 F5 91 28
0320- AD 00 C0 2C 10 00 60 00

```

```
BSAVE CURSOR,A$300,L$28
```

Listing II

```

10 FOR I = 768 TO 806: READ
    C: POKE I,C: NEXT : CALL
    768
20 DATA 169,11,133,56,
    169,3,133,57,76,234,3,72,4
    1,63,9,0,145,40,104,230,78
    ,208,2,230,79,44,0,192,16,
    245,145,40,173,0,192,44,16
    ,192,96

```

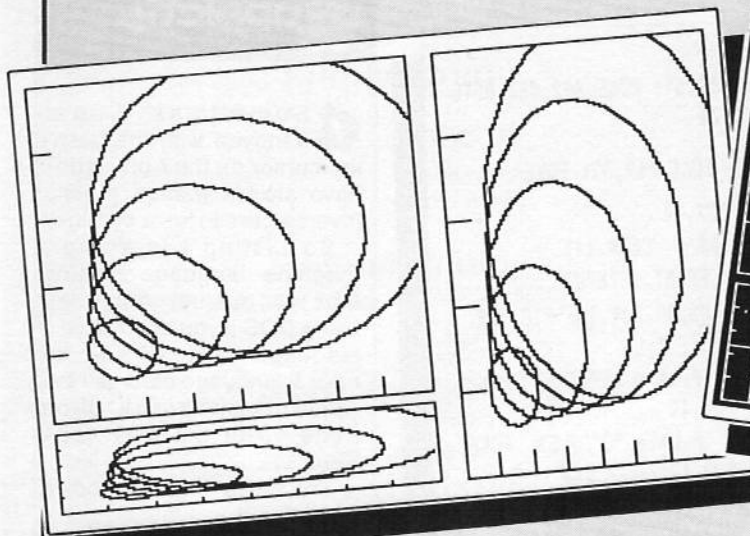
Listing III

```

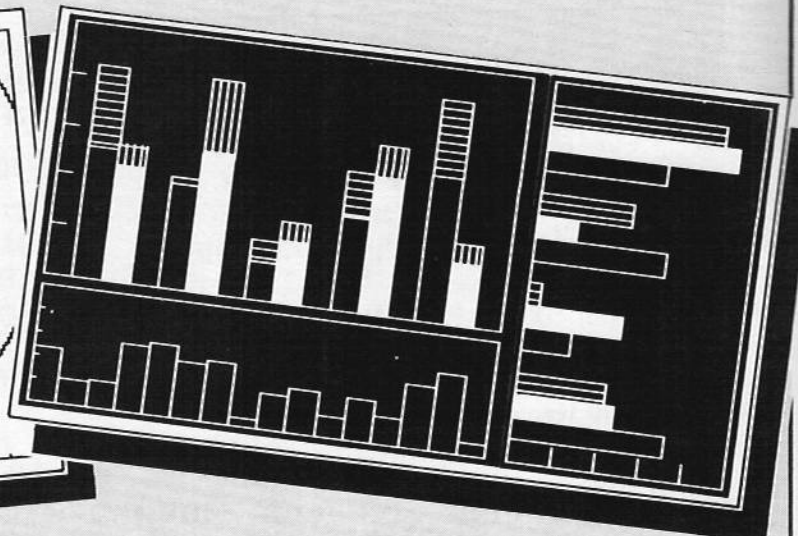
10 FOR I = 768 TO 796: READ
    C: POKE I,C: NEXT
15 PRINT CHR$ (4)"IN#
    A768"
20 DATA 216,72,41,63,9,
    0,145,40,104,230,78,208,2,
    230,79,44,0,192,16,245,145
    ,40,173,0,192,44,16,192,96

```

apple user Graphics Library



Three plots from the example program



Example of the flexibility created by calling the routines three times

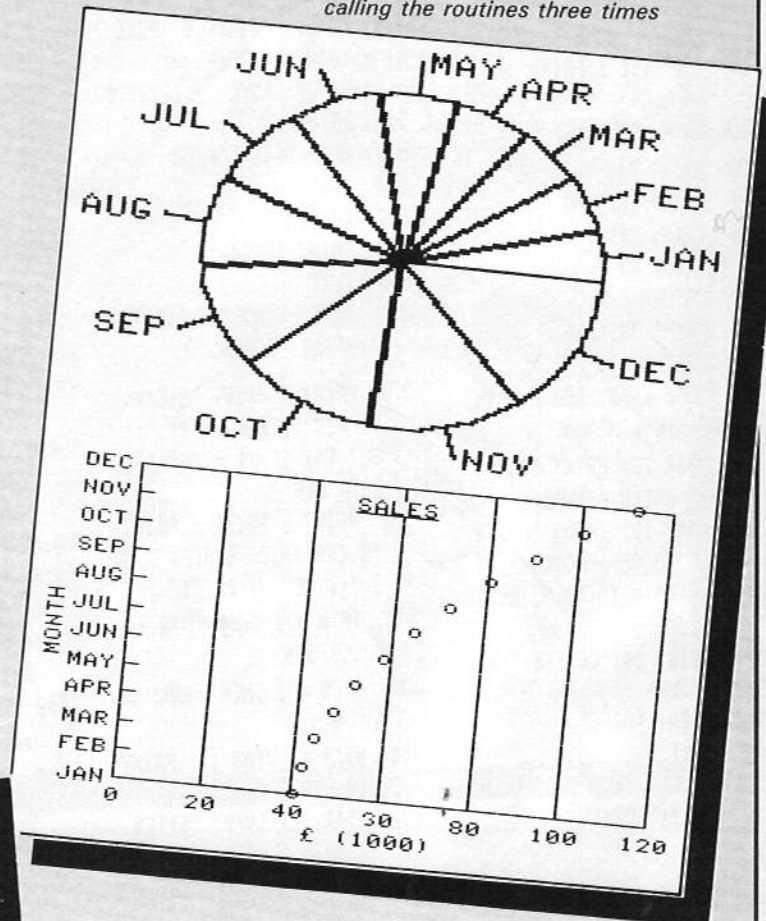
The November issue of *Apple User* saw the last in the Graphics Library series. For the benefit of those readers who missed some of the articles the complete list of issues that featured the Apple User Graphics Library are given in the panel below. Back numbers are still available, and these are listed on Page 60.

A disc has now been prepared containing all the routines presented in the series and this is available for £5.95.

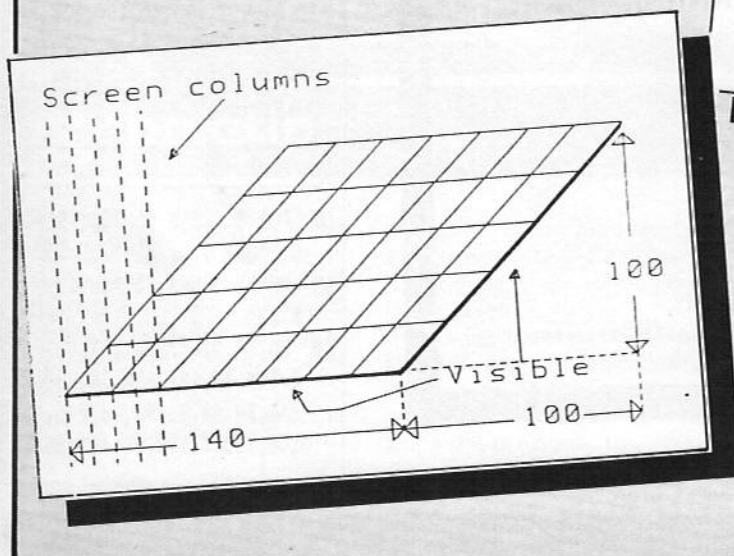
A complete set of photocopies of all the articles can be obtained, also for £5.95.

The cost of the disc plus the photocopied articles is £9.95.

To order, use the form on Page 61.



Produced by the example program



Part 1	February 1984	Part 10	December 1984
Part 2	March 1984	Part 11	February 1985
Part 3	April 1984	Part 12	March 1985
Part 4	May 1984	Part 13	May 1985
Part 5	June 1984	Part 14	July 1985
Part 6	August 1984	Part 15	August 1985
Part 7	September 1984	Part 16	October 1985
Part 8	October 1984	Part 17	November 1985
Part 9	November 1984		

TWO printer interface cards new on the scene have made me think that things can go round in circles and improve at the same time.

In the very early days of the Apple II series, serial printers were driven entirely from software via the game port.

This did not last long. Very soon, simple I/O cards, both parallel and serial, appeared and gradually it became standard to put the printer interface card into slot 1.

Then intelligent cards began to appear, designed mainly to drive those dot matrix printers capable of graphical output. With onboard firmware the hi-res screens could easily be dumped to paper.

However different manufacturers used different sequences of commands to drive the firmware. This meant that software had to be patched for the variety of cards available and, of course, only the more popular cards and printers were supported.

More recently a de facto standard has appeared for Apple II cards, the way being led by the Grappler series.

Under this scheme, control sequences are initiated by a Ctrl-I [CHR\$(9)] being sent to the card, followed by characters such as G for graphics dump. Most software supports these commands, hence there are obvious benefits to the user.

The two cards I've been looking at, The Tackler, from Tymac Controls Corporation, and The Champion, from Cirtech (UK), both use this scheme and yet each, in a way, harks back to the early days. The Tackler will drive parallel printers with Epson command protocols, and other parallel printers by changing the onboard ROM.

The list of printers accommodated include Star, Riteman, Smith-Corona, BMC-80, Olympia, Panasonic, Mannesman-Tally/Okidata, Canon/Citoh, NEC/Seikosha, and the Gorilla Banana, or at least the manual says it will.

I've only tested some of the Epson range and, yes, there is such a printer as the Gorilla

Flash back, to good effect

MAX PARROTT looks at two new printer interface cards and finds that the past has a helpful habit of catching up with things

Banana — it is frequently advertised in the American magazines.

I tried The Tackler with an Epson MX-80 on the Apple II+ and an FX-100 on the IIe running under Basic/DOS 3.3, ProDOS, Pascal, CP/M, and Metacraft's Forth.

The card has commands to control line-feeds (whether to send or not), bit 7 (again whether to send or not), the bell character (whether to send or not), page length, line length, and the position of the left and right margins.

The graphics commands dump either hi-res page at single or double size, in normal or inverse mode and can be rotated through 90°. The picture can be centred on the page

or set at the left margin.

If large pictures do not fit on the page they have to be rotated. According to the manual attempts to print pictures which will not fit on the page can cause the printer to hang but did not do so with the Epsoms.

The way in which this card is reminiscent of the old days is that there is an onboard switch which cuts off most of the intelligent functions leaving a very simple, primitive, parallel I/O card for those applications in which too much intelligence can be a nuisance.

Cirtech's card is one of their new Champion range. Like The Tackler this too is a Centronics standard, parallel card, as small and neat as all Cirtech cards are,

which, with different ROMs can drive a variety of printers.

It uses the standard Grappler commands, unlike Cirtech's earlier printer cards, together with some very welcome extensions.

These include the ability to change character set where applicable, character size and type — between proportional and normal fonts, and Pica, Elite and condensed — X and Y scaling when dumping hi-res pages, dot density when driving graphics, and the ability to AND, OR and EOR pages 1 and 2 together for the final printed results.

The background can also be filled with a grey effect or the picture faded. Text screen dumps of the 40 and 80 (Apple IIe only) column modes can also be made.

With the addition of a small adapter which fits into the games port the card can drive serial printers as well and receive serial input. The adapter has a socket on it so that joysticks can be used as normal.

The card can also be bought in a 16k or 64k cache format, that is with a printer buffer.

In this form you can drive a parallel printer and a serial device such as a plotter through the game card at essentially the same time. A software command changes the output

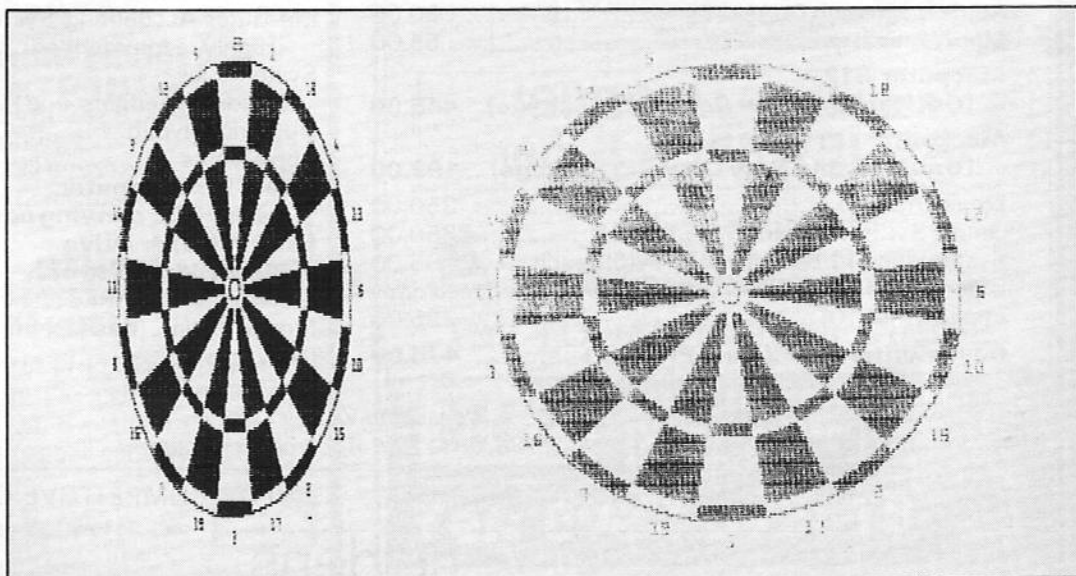


Figure 1: The effect of changing the print dot density

direction and baud rates for input and output independently.

The serial format is 1 start, 8 data and 2 stop bits without parity for output and input and operates as an RS232C type interface handling the signals REC DATA/DTR, XMT DATA and DSR with software selectable baud rate ranges from 75 to 9600 in eight steps, independently changeable for input and output.

The card can also act as a serial printer interface and I actually tested the card in the simple, no-buffer, serial form driving the Apple Imagewriter from a IIe using Basic/DOS 3.3, ProDOS, Pascal, CP/M and Metacraft's Forth. Everything worked perfectly.

The ability to change the dot density is most welcome, as this allows the printing of true circles, and the variable X and Y scaling allows the page to be used as the programmer wants.

Nowadays the test of a good I/O card is whether it is capable of printing from Appleworks. Both cards worked faultlessly

Curiously, neither manual mentioned the command character to drive the onboard firmware from Pascal or CP/M [Ctrl-Y,chr(25)]. The Cirtech manual also neglected to point out that the position of a hi-res dump on the page can be controlled by setting the left hand margin for text. This gave full control over the position to within one character's width with the Champion, at least on the Imagewriter. I could not accomplish the same control with the Tackler and the Epsoms.

In the old days a test of a good I/O card was whether it

was able to handle Pascal – many could not. Now the test is whether it is capable of printing from Appleworks. Both cards worked faultlessly.

If you want more control over your printer in an effortless way then cards such as these are the way to go. There are quite a few available and I cannot try them all.

I have tried the Grappler and Grappler+, the Blackboard (see *Apple User*, October 1984), some of the Epson cards and now these two – all for Centronics type parallel printers (I cannot recommend the Epson

cards). The others all work well and the differences between them and their relative costs will determine which is your best buy.

For parallel systems the home-grown cards seem to me to offer better value for money than the American. With the present advertised prices the Cirtech cards are excellent value.

If you have an Imagewriter printer and a IIe or II+ then the Champion with the serial adapter will be a good choice. Indeed it is the only intelligent serial interface I have seen.

The Tackler from Tymac (UK), Unit 78 Standard Way, Gravelly Industrial Park, Tyburn Road, Birmingham B24 8TL. Tel: 021-327 6637.

The Champion from Cirtech (UK), Currie Road Industrial Estate, Galashiels, Selkirkshire. Tel: 0896 57790.

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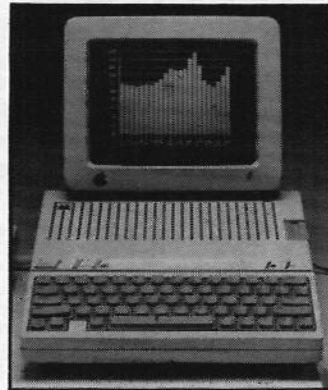
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 *** See What's New ***

Put your Apple in the picture

THE *Apple User* gave a good account of an interface to digitise a video signal for display on the Apple screen in last October's issue. But there is another way of obtaining digital picture images directly without a CCTV camera, using a video RAM camera.

The camera I used is the Snap EV-1 (see picture), made by Micro Robotics and marketed by Commotion. It contains a digital IS-32 Optic RAM chip and driving circuitry and comes in an attractive black plastic case (2.75in x 2in x 1in) with a standard interchangeable Pentax 24mm f2.8 lens and 1.5 metres of cable.

The picture format is 256 x 128 pixel elements, and it can be programmed for a variety of tasks such as object recognition, calculation of relative areas or perimeters, and security systems to detect any movement or change in position of objects.

Like the Computereyes reviewed in October 1985 it can also produce a grey scale image by repeating frames at different exposures. The total cost is £129.

So, you are asking, why isn't everyone buying one? The only problem is that the camera as sold at the moment is only interfaced for the BBC and Commodore computers.

But what, I asked myself, do these machines have that my Apple does not? And having seen an excellent demonstration of the camera at the Robotics show in London last year, I resolved to put one to work with my own robot through the trusty Apple.

This involved building a simple interface (see circuit diagram in Figure 1) to connect to the Apple games socket. The Apple needs to send three signals to the camera. The clock pulse, which must be between 1 and 10µsec, is obtained by stretching the Strobe C040 pulse using a 74LS122 monostable, U1.

The other two outputs are Annunciator 2 to reset the camera and Annunciator 0 which switches from one half frame to the other, and is a technical requirement of the camera.

Data-in from the camera



JOHN MARR shows how to use a video RAM camera to obtain digital picture images

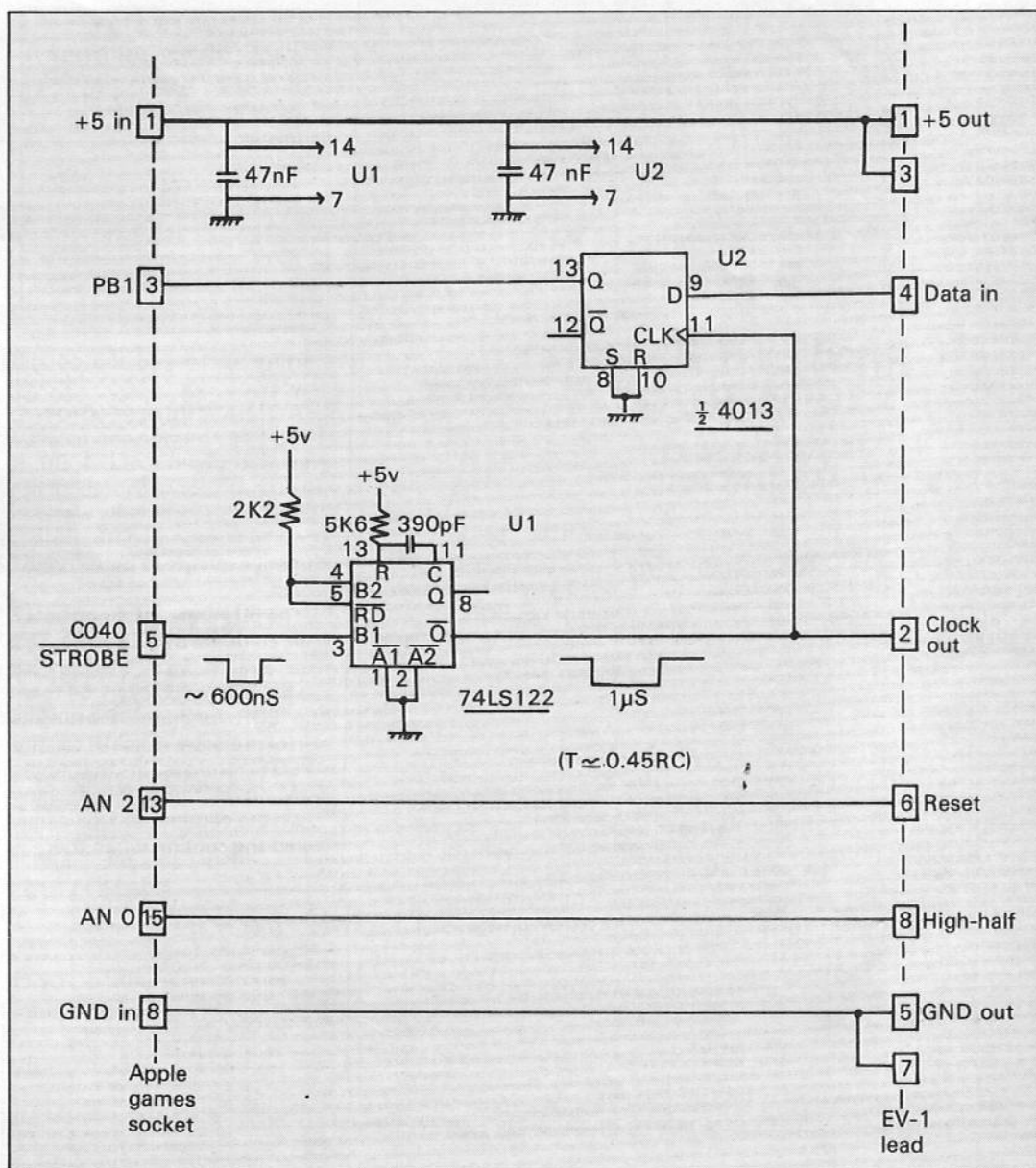


Figure 1: Apple II EV-1 interface

```

SOURCE FILE: EV-1
0000: 1 *****
0000: 2 * SNAP EV-1
0000: 3 * PICTURE ROUTINE
0000: 4 * FOR APPLE II+ OR IIE
0000: 5 *
0000: 6 * JOHN MARR
0000: 7 * 7 OCTOBER 1985
0000: 8 *
0000: 9 *****
0003: 10 XCOR EQU #03 ;SCREEN COORDS
0004: 11 YCOR EQU #04 ;FOR DOT PLOT
0009: 12 INVFLG EQU #09
000C: 13 LIMIT EQU #0C ;ROW WIDTH VECTOR
F3E2: 14 HGR EQU #F3E2
F457: 15 HPLDT EQU #F457
F6EC: 16 SETHCOL EQU #F6EC ;SET HCOLOR TO CONTENTS OF X-REG
C062: 17 PB1 EQU #C062 ; DATA IN
C040: 18 STROBE EQU #C040
C058: 19 ANO0FF EQU #C058 ; HIGH-HALF
C059: 20 ANO0N EQU #C059
C05C: 21 AN20FF EQU #C05C ; RESET
C05D: 22 AN20N EQU #C05D
----- NEXT OBJECT FILE NAME IS EV-1.OBJ0
1000: 23 ORG #1000
1000:20 E2 F3 24 START JSR HGR ; CLEAR SCREEN TO BLACK
1003:A9 00 25 LDA #00
1005:85 03 26 STA XCOR
1007:85 04 27 STA YCOR
1009:85 09 28 STA INVFLG
100B:A2 07 29 LDX #07 ; WHITE
100D:20 EC F6 30 JSR SETHCOL
1010:A2 08 31 LDX #08 ;VALUE FOR FIRST COLUMN WIDTH
1012:86 0C 32 STX LIMIT
1014:2C 5C C0 33 BIT AN20FF ;FULL RESET LOW
1017:2C 5D C0 34 BIT AN20N ;FOR 1USEC
101A:2C 58 C0 35 BIT ANO0FF ;HIGH-HALF LOW
101D:2C 40 C0 36 RDDATA BIT STROBE ;CLOCK PULSE
1020:AD 62 C0 37 LDA PB1 ; GET DATA IN
1023:45 09 38 EOR INVFLG ;IS THERE A PIXEL?
1025:10 09 39 BPL NOPLDT ; NO- PLOT NOTHING
1027:A5 04 40 LDA YCOR ; YES - PLOT THE POINT
1029:A6 03 41 LDX XCOR
102B:A0 00 42 LDY #00 ; (XCOR HI-BYTE ALWAYS 0)
102D:20 57 F4 43 JSR HPLDT
1030:A6 03 44 NOPLDT LDX XCOR ;NEXT BIT OF BYTE
1032:EB 45 45 INX
1033:E4 0C 46 CPX LIMIT ;8 BITS DONE YET?
1035:F0 05 47 BEQ NXTROW ;YES - UPDATE
1037:86 03 48 STX XCOR ;NO - NEXT BIT
1039:18 49 49 CLC
103A:90 E1 50 BCC RDDATA
103C:A4 04 51 NXTROW LDY YCOR ;NEXT ROW
103E:C8 52 52 INY
103F:98 53 53 TYA
1040:29 3F 54 AND #3F ;64 BYTES YET?
1042:D0 06 55 BNE NEXT1 ;NO
1044:A5 09 56 LDA INVFLG ;YES - SO CHANGE ROUND
1046:49 80 57 EOR #80
1048:85 09 58 STA INVFLG
104A:C0 80 59 NEXT1 CPY #80 ;THIS COLUMN DONE?
104C:F0 0B 60 BEQ NXTCOL ;YES - RESET YCOR FOR NEXT COLUMN
104E:84 04 61 STY YCOR ;NO -
1050:8A 62 62 TXA ;SO DO NEXT 8 BITS
1051:38 63 63 SEC
1052:E9 08 64 SBC #08
1054:85 03 65 STA XCOR
1056:18 66 66 CLC
1057:90 C4 67 BCC RDDATA
1059:E0 00 68 NXTCOL CPX #00 ;ALL DONE?
105B:F0 1D 69 BEQ OUT ;YES - SO EXIT
105D:A0 00 70 LDY #00 ;NEXT COLUMN
105F:84 04 71 STY YCOR
1061:86 03 72 STX XCOR
1063:A5 0C 73 LDA LIMIT
1065:C9 80 74 CMP #80 ;HALF WAY THROUGH?
1067:D0 09 75 BNE NEXT2 ;NO
1069:2C 5C C0 76 BIT AN20FF
106C:2C 5D C0 77 BIT AN20N ;RESET
106F:2C 59 C0 78 BIT ANO0N ;SET HIGH-HALF
1072:18 79 NEXT2 CLC
1073:69 08 80 ADC #08 ;UPDATE LIMIT FOR NEXT COLUMN
1075:85 0C 81 STA LIMIT
1077:18 82 82 CLC
1078:90 A3 83 BCC RDDATA
107A:F0 B4 84 OUT BEQ START ;KEEP DOING IT FOR DEMONSTRATION

*** SUCCESSFUL ASSEMBLY: NO ERRORS

```

comes in serial bit form, and is valid on the rising edge of the clock. This is latched into the 4013 latch, U2, so as to be available whenever the Apple gets round to reading it.

Connection to the EV-1 is via a 20 way IDC header to the Apple games socket through a 16 pin DIL connector. Total cost for parts was under £7 from Maplin, and layout was straight forward using Veroboard (Figure II).

The listing is a demonstration I wrote which gives a continuous display on the screen. This is completely relocatable, and can be entered from the monitor (Call -151) at any convenient

PARTS LIST

1 74LS122 (Maplin QQ54J).
 1 4013BE (Maplin QX07H).
 1 20 way IDC header (Maplin FJ14Q).
 Veroboard.
 1 2K2 resistor.
 1 5K6 resistor.
 1 390pF capacitor.
 2 47nF capacitor.
 1 16 pin DIL plug.
 2ft Six way ribbon cable.

starting address in the normal way.

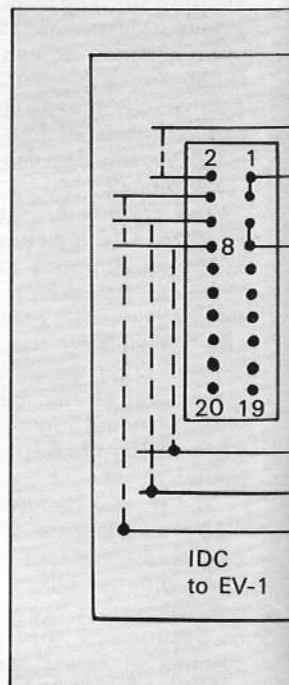
At the address shown, \$1000, the routine can be used from Basic with CALL 4096. It looks a bit strange, but there are two first class manuals with the camera, and the technical manual explains in detail why it works.

The pixels are arranged as 32 8 bit columns by 128 rows. The data stream from the camera has to be inverted every 64 rows (the EOR function). Plotting is performed by a call to the HPLDT routines in the Apple ROM. It is these which slow down the camera, so I have only called the routine when there is

```

1000- 20 E2 F3 A9 00 85 03 85
100B- 04 85 09 A2 07 20 EC F6
1010- A2 08 B6 0C 2C 5C C0 2C
101B- 5D C0 2C 58 C0 2C 40 C0
1020- AD 62 C0 45 09 10 09 A5
102B- 04 A6 03 A0 00 20 57 F4
1030- A6 03 EB E4 0C F0 05 B6
103B- 03 18 90 E1 A4 04 C8 98
1040- 29 3F D0 06 A5 09 49 80
104B- 85 09 C0 B0 F0 08 B4 04
1050- BA 38 E9 08 B5 03 18 90
105B- C4 E0 00 F0 1D A0 00 84
1060- 04 B6 03 A5 0C C9 B0 D0
106B- 09 2C 5C C0 2C 5D C0 2C
1070- 59 C0 18 69 08 B5 0C 18
107B- 90 A3 F0 B4

```



a dot to plot.

This makes the routine very fast for a small white object on a black background, but much slower for a large area of white, and this does affect the light-sensitivity.

However I found a simple Anglepoise lamp with a 75 watt bulb quite adequate for adjusting the lighting intensity to a suitable level.

I use the camera on the Apple II+, but I have demonstrated it at a robotics show in San Francisco using an Apple IIe and it worked equally well on that machine.

The other manual supplied with the camera is a set of 6502 machine code listings for the various tasks the camera can do. I haven't yet translated these for the Apple but if there is enough interest perhaps they can be given at a later date.

Product: Snap EV-1 Video RAM Camera.
 Manufacturer: Micro Robotics.
 Distributor: Commotion, 241 Green Street, Enfield EN3 7SJ. Tel: 01-804 1378.
 Price: £129.
 System: Apple II family with 48k.

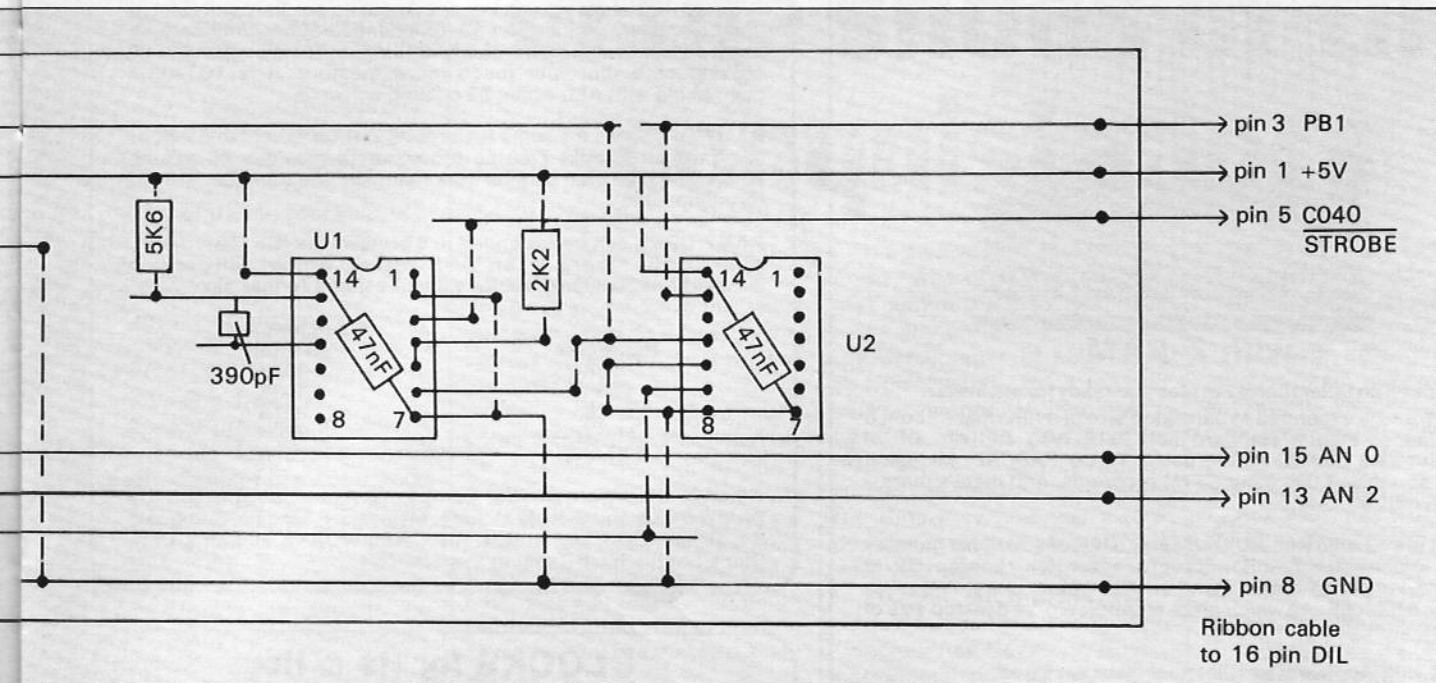


Figure II: Apple II EV-1 Interface Veroboard layout (underside)

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Z-RAM is available with either 256K or 512K of additional memory PLUS a powerful Z-80B microprocessor for running CP/M software. Added to the IIc standard 128K of memory, that gives 384K or 640K of Ram, which gives an AppleWorks desktop size of 229K or 413K.

Z-RAM with AppleWorks will knock your socks off.

As well as expanding the actual desktop size, Z-RAM will also simultaneously load the AppleWorks program into memory thus eliminating the need for a second disk drive. This "Ram-disking" also means that AppleWorks will now run about 10 times faster.

And don't worry about the desktop files being larger than floppy disk capacity – if the file is bigger than the remaining space on a disk Z-RAM will automatically segment the file and prompt you when to insert subsequent disks.

Z-RAM will expand the AppleWorks DataBase to 5100 records per file, and doubles the Word Processor size to 5100 lines per document.

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Z-RAM is also a high speed solid state disk drive or Ram-Disk and is compatible with Applesoft, PRO-DOS, DOS 3.3, PASCAL and CP/M.

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

Z-RAM is easily handled by the IIc power supply by using a patent-pending power saving design.

Z-RAM comes complete with manual, Ram-Disk software (CP/M, ProDos and Dos 3.3), Z-80 operating system, CP/M manual and AppleWorks Expansion software.

SOFTWARE FOR APPLEWORKS

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Provides business graphics for AppleWorks. Graphs directly from AppleWorks Spreadsheet Graph Types: Pie, Bar, Stacked-Bar and Line.

2.5 MEG IIc with RAMWORKS

RAMWORKS is the memory card for the Apple IIc that gives the Appleworks user previously unheard of memory capacity. And more.

RAMWORKS simply plugs into the Apple IIc auxiliary slot (Slot 3) and completely replaces an 80 (or extended 80) column card. In use it functions and behaves EXACTLY like Apple's extended 80 column card, but with much more memory. It is TOTALLY compatible with ALL Apple 80 column software.

RAMWORKS has the same features as Z-RAM except that it does not have an in-built Z-80 co-processor (it provides 80-column display) and the print spooler works with Apple's Super Serial Card (or compatible).

RAMWORKS can be expanded to a greater size (2.5 Megabytes). Additionally, there is an RGB option which will provide double-hi-res colour graphics without using a further slot.

Ramworks	Appleworks Desktop
128K	101K
256K	183K
512K	367K
1 MEG	736K
2.5 MEG	1837K

As well as AppleWorks, other programs supported by RAMWORKS and Z-RAM include: Magicalc, Flashcalc, Supercalc 3A, Diversi-DOS and others. Also, RAMWORKS supports Dark Star's Shuttle Multi-Tasking System.

CLOCKS for IIc & IIc

TIMEMASTER H.O. – IIc SYSTEM CLOCK – IIc

Both these clocks offer full Pro-Dos compatibility and automatic time and date stamping of files – including AppleWorks files. When used in conjunction with RAMWORKS or Z-RAM, these clocks will continuously display the date and time on the Appleworks screen, and give automatic access from AppleWorks database (just use a time or date field).

Timemaster for IIc plugs into any slot, features a 20 year auto-recharging battery and will emulate other clocks.

System Clock for IIc features a pass through serial port – the IIc system clock plugs into either IIc serial port, then the modem or printer plugs into the clock. Batteries are replaceable (1-2 years).

ORDERING INFORMATION

256K Z-RAM	£359.00
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In the shoes of the conquistadors

SEVEN Cities of Gold from Ariolasoft/Electronic Arts, takes you back to the early sixteenth century, "the age of discovery, exploration and conquest", and puts you in the shoes of the Spanish conquistadors.

After outfitting your ship, you set sail and head into the unknown, hoping to discover the New World!

Once you are on your way you have a scrolling overhead view of your ship and the surrounding area.

Around the viewing window are various details about your speed, depth of the water, food supplies and also the month and year.

This latter is an important factor that is often overlooked, since it holds the clues to the seasons and hence the weather conditions, which vary depending on your latitude and the time of year. If you are caught in a bad storm you could be blown many miles off course and end up lost.

Assuming you manage to reach land, you can begin to explore it. You have quite a bit to explore too. According to its makers, *Seven Cities* is geographically accurate and has over 2800 screens representing 11,000 square miles, so the possibilities for adventuring are vast indeed.

As you explore you encounter many different types of terrain which the computer maps for you automatically.

Rivers play an important part in helping you plot your course through the land, and often they will help you find your way back to your ship.

When you set out overland you must manage your resources well, or you may never make it back.

Too little food and you starve. Collect too much gold by too few men and you're in trouble again.

You can discover the Mississippi, the Great Lakes, the Amazon jungle, the Straits of Magellan, as well as over 200 different native settlements, ranging from small villages up to mighty Aztec cities and the Incan empires.

The natives vary quite a bit as well - everything from humble

farming communities and hunting tribes to great civilisations.

To get anywhere in the game you must learn to deal with the natives - trading, fighting or just plain genocide.

If you decide to fight word spreads fast, and when you visit other settlements you are given a less than peaceful reception.

If, on the other hand you are friendly you can establish much better relationships. In either case you will find as the game progresses, that your reputation precedes you in a quite uncanny way.

Trading with the natives will usually bring you riches, as well as native bearers to help you carry your goods. These bearers also hold vital clues to the game, such as the locations of hidden gold mines.

If you become rich enough you can establish your own forts and missions, provided you can afford enough men to keep them guarded and supply them with enough food.

Once you have had your fill of exploring you can sail back to Spain, and on arrival there visit your local tavern and save the game to disc.

It's always nice to visit your home, where you can sit back and admire the maps you have made along the way, as well as the percentages of how much you discovered, which fall into several categories - land, rivers, natives, mines and special features.

You can visit the court, where the King may give you a rank depending on how pleased he is with your discoveries.

You start out with the rank of novice, but can achieve Captain General, Vice Governor, Governor General, right up to Viceroy.

The first time you return the court usually grants you more gold with which you can continue your expedition. On following visits it may not be so generous.

If all this isn't enough to keep you busy for days at a time, *Seven Cities* allows you to generate an infinite number of different New Worlds.

The manual says the new continents are not drawn at random, but conform to the "geological and cultural principles built into the program code", such as the inbuilt plate tectonics model as well as a

cultural dissemination model for deciding the layout of native settlements in relation to the land and also each other.

This is quite a game, and I found it totally absorbing once I got into it. My only grumble is with the manual, which is a lot smaller than I expected, both in size and content.

Ariolasoft has a tendency to shrink the size of the packaging and instructions of all their American imports by half which makes the manual a little hard to follow. Alas, no magnifying glass included.

To put *Seven Cities* into any one category is difficult, but the best I can think of is to call it a historical simulation. At just under £20, it provides excellent value and great entertainment.

Leon Seltsikas

Title: Seven Cities of Gold.

Authors: Bill and Dan Buntun.

Publisher: Electronic Arts/Ariolasoft.

Requirements: Any Apple II with 64k and joystick.



Land up in an adventure of your own making...

WITH **Adventure Construction Set** Ariolasoft have come up with a new software package that will suit the needs of every adventurer, novice or advanced.

It includes seven ready-made adventures, which were all created using ACS, for you to play. They give you a good indication of what it can do.

On first booting the disc, you can watch a demo or you can start getting into it yourself. First you have to make an adventure disc containing data and maps which takes a few minutes. For those with only one drive it may take a little longer, in view of all the swapping of discs. Copying and formatting is fully prompted, so no problems should occur.

Once the disc is prepared you are ready to play or construct an adventure. Control is by joystick, keyboard or mouse. If you choose to play an adventure, you can choose from the two ready-made ones or one that you may have created beforehand.

The first adventure that comes with ACS is *The Land of Aventuria*, which contains within it seven mini adventures to introduce you gradually to the various features. Within the mini adventures are various messages which make up an interactive how-to-play guide.

The other adventure is a large, complex one, *The Rivers of Light*, which is intended for more advanced players.

The adventures are fairly good, but they do have a few minor pitfalls. The graphics are clear and bright, but the character movement is a bit slow. Such things as disc access and scrolling are good, not being too slow as to keep one waiting.

The sounds and music are fair through the Apple speaker, but if you have a Mockingboard (Ile) or Cricket (Iic) they are catered for as well, which gives you better quality sound.

On selecting the construction option you are given a series of main menus to choose from, which lead to more menus.

The whole constructing part is geared around a network of tree-structured menus, and you

have a vast number of options, in fact just about everything any adventurer could ever want. It gives you a great deal of flexibility in the design and implementation, so you can do just about anything.

Constructing an adventure may take some time for the beginner, but for the experienced user an hour or two should suffice, depending on how big and complicated you want to make it.

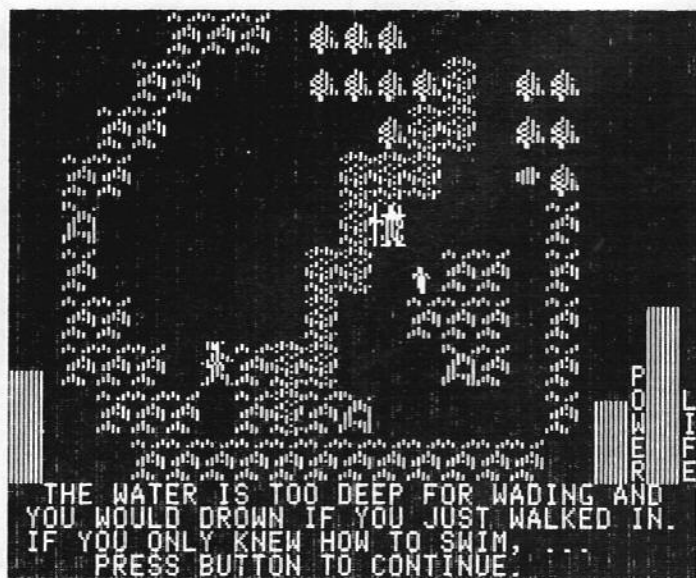
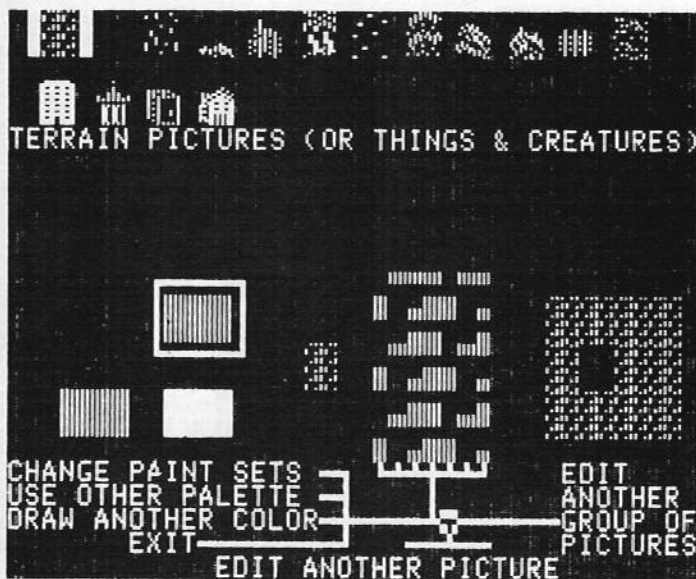
Once you have named your rooms, selected your creatures and so on you can go and make a cup of tea while ACS writes the adventure for you. It takes the best part of half an hour. After that you are ready to play your masterpiece.

The only major fault I found with the package was the manual. Although it was easy enough to follow it was a bit small — each page is smaller than a disc and its durability is in question as well.

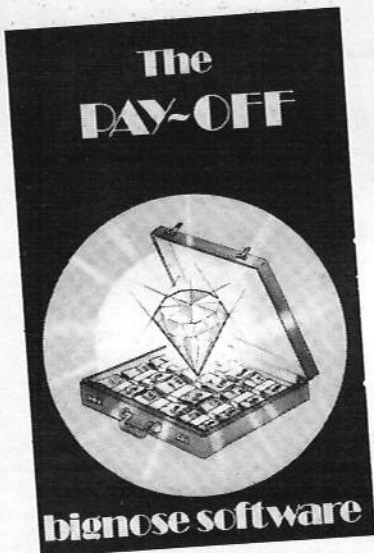
Otherwise this is a worthwhile package for anyone's collection. At £19.95, no adventurer can get a better deal.

John Bryhn

Title: Adventure Construction Set.
Author: Stuart Smith.
Publisher: Electronic Arts/ Ariolasoft.
Requirements: Any Apple with 64k.
Optional: Joystick, Mouse, Mockingboard or Cricket.



THE TWO-BIT HOODLUM WITH CONCRETE WELLIES



THE Pay-Off is a text-based adventure from the delightfully named Bignose Software – “not to be sneezed at!”

In it you play the part of a two-bit hoodlum who owes Luigi a lot of money – 40k of the folding stuff, to be exact.

The \$50 you've got will just about buy you a pair of concrete wellies now that Luigi is calling

in his marker. So how are you going to pay your debt? That's the problem you've got to solve, so I'm not telling.

Of course there are lots of sub-problems along the way, and you'll need to think yourself into the part if you're going to solve them. For example, you might think that treacle would give you lots of energy, but the criminal fraternity puts this substance to other uses.

It's not a big adventure – I'd guess at about 50 locations – but is hard enough to give you a struggle.

It's also quite well written, so getting involved shouldn't be a problem. The authors call it an “adventurer's adventure”, which is to say that they play adventure games as well as writing them, so they know

what players want.

Another good thing about The Pay-Off is the price – only £7.95. That's because Bignose Software is based in Basildon rather than Silicon Valley.

The rights to the game were bought by Atari at one stage so that they could distribute it as a give-away with their disc drive, but they're now letting Bignose distribute it for other machines.

It is text-based in the Scott Adams tradition, with descriptions sparse and the vocabulary a bit limited. Within those confines, though, I found it a good game and only noticed one typographical error throughout.

Don't expect Infocom-style packaging. For the price you get the disc and a small folded card about the size of a cassette

insert. Much as the Infocom packages delight me, I'm prepared to do without them if it keeps the cost down and the game is good.

Apparently Bignose has written another adventure based on the Phantom of the Opera story so it looks as though we might be in for a steady stream from this software house. I hope so – I'm always on the lookout for cut-price adventures.

Dave Russell

*Title: The Pay Off.
Authors: Steve Calkin & Pete Sleeman.
Publishers: Bignose Software.
Requirements: 48k Apple II family.*



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SAMLESBURY Hall is a beautiful, half-timbered fourteenth century house near Preston in Lancashire that seems as far removed from today's technology as it is from its own turbulent past.

Yet it houses two Apple IIe personal computers which work full time at a wide variety of administrative tasks.

Samlesbury is run by a charitable trust whose purpose is to maintain the hall for the use and enjoyment of the people in the area – and in any week it receives up to 1,500 visitors. The mainstay of the trust's activities is its exhibitions – in particular of antiques and collectors' items – which are held regularly at the hall.

Until early in 1984 the 19-strong permanent staff of Samlesbury Hall and its 120 voluntary workers ran their business in the traditional way with no help from modern technology. When the manag-

How technology keeps the past up to date

BRYAN WILLIAMS watches Apples at work in a 14th century house

ing director, Mr Arthur Bickerstaffe, decided to install a personal computer at the hall, he initially intended it to cope with the administration of the Friends of Samlesbury, a group of nearly 5,000 supporters of the hall's activities.

So in February 1984 Holdens of Preston installed the first Apple IIe in Samlesbury Hall complete with monitor, two disc drives and a printer. This Apple IIe soon took control of the

Friends database, organising membership details and mailings with the help of Ormbeta's database package.

So successful was this system in handling routine, time-consuming jobs, and so well did the staff at Samlesbury adapt to using the Apple, that Mr Bickerstaffe began to look at more ambitious uses for it.

Six months later a second Apple IIe was installed to be used for a wide variety of

applications. These include the hall's accounts, the staff salaries, and records totalling up to 2,000 a year of the people who bring antiques and other items to Samlesbury for sale at exhibitions.

The software used for all this includes AppleWorks, the integrated database, spreadsheet and word processor from Apple, Ormbeta's Compact Accounting Package, and Systematics' Payroll. As Mr Bickerstaffe said:

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THE COMPATIBLE PEOPLE

"Once we saw the usefulness of the first Apple IIe, we had no difficulty finding work for a second".

Indeed, there is more than enough work. The Samlesbury Hall Trust has solved the problem of maintaining the hall by a unique method of handling antiques and collectors' items — a method developed over the past eight years.

People from all over the North of England use the service, which enables them to offer items for sale with a reserve price in some of the hall's least historic rooms.

Bids are made by visitors to the exhibitions, and Mr Bickerstaffe's team collate the results to identify the highest bidder against the reserve price for each item.

This is now done on the second Apple IIe system and its benefits are obvious. Error margin is reduced, and the long, tedious job of sorting large amounts of data is lightened by the electronic database.

Mr Bickerstaffe is so pleased with the results that he has plans for further expansion: "What I would like to do next is put the accounting side of our exhibitions on to the Apples.

"We currently only log customer information and results of bidding on to the micro, but I would like to computerise the whole operation.

"It's a very big job that will require a hard disc, but I am considering it very seriously. The next step after that would be networking, but that is probably a long-term project".

Incongruous as Samlesbury Hall may seem as a setting for new technology, the two complement each other perfectly. Mr Bickerstaffe and his IIs have become local celebrities: "People talk about our half-timbered computers!"

Of the 19 regular staff at the hall, about five use the Apples regularly, including Mr Bickerstaffe himself, the administrator, Norman Lond and the exhibitions assistant Diana Birnie. They are all delighted with the systems, although they are all using computers for the first time.

Holdens of Preston, the Apple dealer who supplied the hardware and software, helped



Arthur Bickerstaffe and his Apple IIs keep Samlesbury Hall running smoothly

with initial training sessions, but the staff of Samlesbury Hall adapted very quickly to working on the Apples. As Mr Bickerstaffe says: "We love them!"

Maintenance of the systems has not been an issue at

Samlesbury: "We have had a couple of minor problems, but nothing serious". So confident is Mr Bickerstaffe that he has taken out no service contract beyond the standard one year warranty on all Apple products.

The biggest problem he has ever had with the Apples? "They are so useful that you have to be selective about how you use them. There is a danger of over-crowding simply because they are so efficient".



Togetherhness - the French way

THESE days software houses seem to be falling over themselves to introduce one box integrated programs for the Mac.

First Jazz came trumpeting in for the 512k Fat Mac. Then Quartet showed it was really only a spreadsheet trying hard to be a database. Microsoft have released Excel and Ashton Tate are rumoured to be writing like mad.

Yet another contender is Ensemble, from Parisian company Controle X, advertised as a fully integrated productivity package.

In essence it attempts to combine database, spreadsheet and business graphics. Like Quartet, it can run in 128k subject to memory limitations.

A key feature is the ingenious adoption of icons to operate the program commands similar to Odesta's Helix, which is a powerful program but hard to master. Would Ensemble prove similar?

The package comes with copy-protected program disc, complete with simple "tour", which must be booted in the internal drive. The main manual is well illustrated and set out. But absorbing the text is hard going given the need to master a whole new vocabulary - not to mention getting the many picture icons off pat.

For this reason it takes some time to get the feel of the program. Once au fait with the basics it's best to get to grips with the more complex example files and calculation templates thoughtfully provided on a separate nicely structured "try me" disc complete with booklet.

Playing with these models is an ideal introduction to what

Ensemble will and will not do.

A well thought out dummy purchase file allows creation, sorting, updating and reporting of typical ongoing business figures.

You are invited to input invoice data into a purchase order file, then - hey presto! - a linked budget file is updated automatically. It's then easy to take information from the budget file and create a subtle graph of differing styles, including 3D.

A further section covers creation of memos and letters utilising either Ensemble's onboard but extremely basic word processor or by grabbing a document from MacWrite. A most powerful advantage on the database side is that graphics are catered for FileVision style and all your favourite picture files can be pasted in from MacPaint or the Scrapbook.

The examples finish with various spreadsheet templates covering budgeting and mail-

merge functions - trouble is they're difficult to emulate.

As you'll have guessed, the program revels in typical French eccentricity. For a start, my demonstration copy is geared for the French keyboard - fun when typing file names - presumably corrected before sales launch. Only the French could dream up all those admittedly pretty little picture icons which change at every screen stage (see base of illustrations).

Even after quite a while I never remembered which command was which. At least the Brits know you can't do it better than the ultra functional standard pulldown menus.

I like the erase icon though, which works just like the one in MacPaint.

Just as well too, it was invaluable for deleting incorrectly positioned fields from which you've no escape - a cancel option is not provided.

The first practical step in

setting up an Ensemble database is to create the layout form of the blank data fields and appropriate text, a tedious procedure.

In common with most card index databases, prior design planning is essential. Clicking the layout icon and dragging rectangles allocates the field after deciding type and any one of a limited range of formats and characteristics available.

A picture field must be specially designated, allowing insertion of graphics into small predefined portions of each record - ideal for, say, an image of employees with their personal data.

To add finishing touches, a decoration icon allows artistic embellishment of records via tools - shapes, pens and patterns.

The Show Page option is really neat too, lifted straight from MacPaint. Once data has been entered, records may be edited individually or automatically updated using the search specification window. You can sort records on up to three fields at a time in ascending, descending or alpha order.

Unfortunately the vital searching and reporting facilities, while comprehensive and fully satisfactory, are irritatingly complicated to control without practice, trial and error. This contrasts with other non-integrated databases such as the easy-to-use File.

For instance, you cannot view a report before printing, as you have to close and return to the desk top first. Test print runs are recommended and are necessary.

A nice touch is that icons of

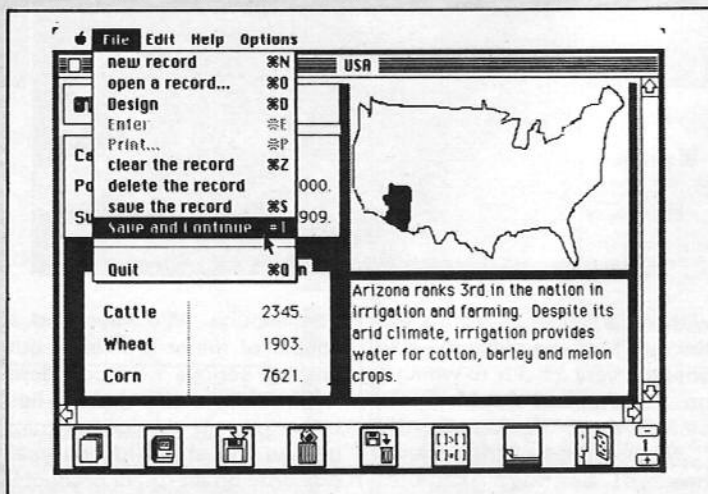


Figure 1: The entry window for adding, searching, saving and showing records

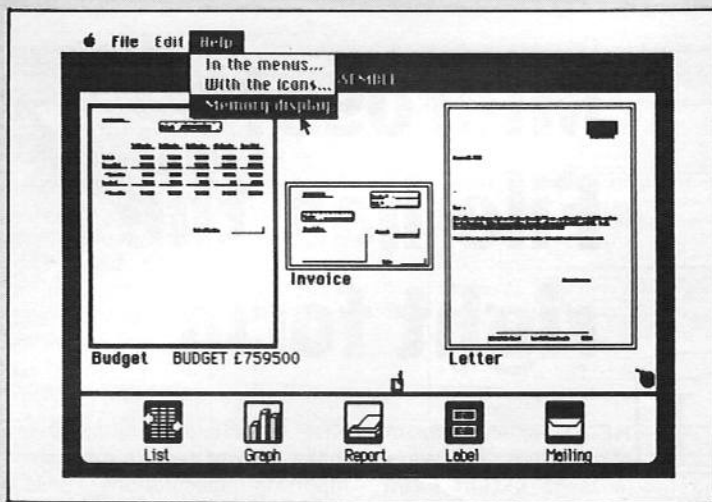


Figure II: Ensemble desktop usefully displaying the images of three closed files

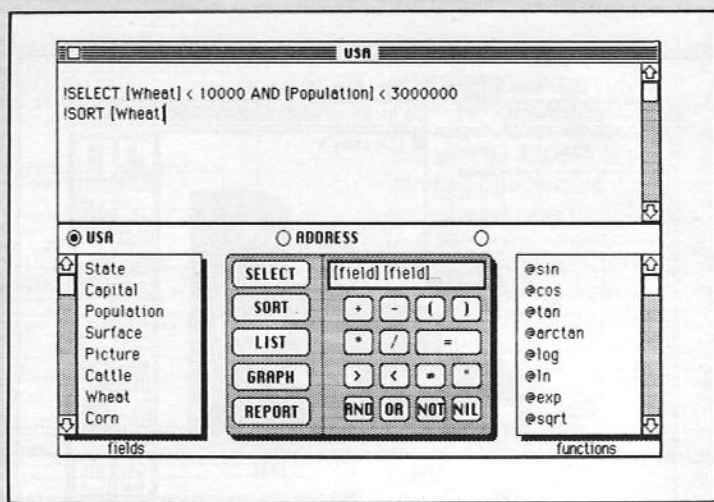


Figure III: A typical search selection request in the specification window – note the odd characters amid the boolean code

up to three closed files show on the desk after printing out (see Figure II).

There are two methods of setting up reports, one with full bells and whistles and the other supposedly simple. In practice both do the job well but neither is particularly convenient. Even the simple listing mode of one record per line is far from quick to organise.

The main drawback is that prior designation of key fields called access keys is necessary although these can be changed if you forget. On the plus side, up to three files can be open at once and be displayed on screen, in either single or multiple forms.

Defining the various selection instructions, computation and report criteria involves much mumbo-jumbo created on a large abacus – witness Figure III of a typical conditional selection from the tutorial.

The usual boolean search criteria apply including wild card and mercifully the unwieldy code is auto-assisted if you click the appropriate buttons.

Annoyingly, you can't save macros of your search sequences and also have to close the search specification window and click 'Perform' before the records actually appear. Why not a simple 'next' click-button?

Form letter, mailmerge and mailing label facilities are built in as standard and there's a very

thoughtful width of printed page option for both printer and screen.

Three screen records fit nicely on to one printed page and the ease of adding pictures into pre-defined spaces – say from the scrapbook – earns Ensemble many Brownie points over ordinary databases.

Although there's provision for reports to link data from three separate files, full scale reindexation and password protection is not supported.

It isn't surprising that the term spreadsheet is omitted from the main manual. The nearest you get is a large-sized grid screen filled with informa-

tion called a list. These may either be typed directly or assembled from up to 30 database fields using search criteria.

Cells can't be protected but calculations (see Figure IV) may be made on individual columns, for example totalled, averaged or sorted, and the results can then be transferred back to your files. This is a quick way of updating them.

The absence of meaningful information about Ensemble's numerical analyses powers is a shame. More complex models are possible and a few covering profit and loss, sales analysis, personal net worth and budget

are briefly paraded on the example disc (see budget file in Figure IV).

Even so, while these might impress a virgin spreadsheet user they only serve to highlight the shortcomings of Ensemble when compared to the possibilities and facilities on a fully autonomous spreadsheet program.

The business graphics section comprises a choice of 10 charts – each type represented by a different icon. Graphs are displayed on a mini spreadsheet 5 columns x 16 rows and slick professional looking charts can be produced automatically and fast.

The snag is that you have to like the pre-prepared styles or lump them – there's little control over the patterns and other visual aspects, apart from arrows and text.

There aren't any statistical or other analysis functions, although these can be achieved, with difficulty, using the spreadsheet module of the program. Trends and percentages can then be calculated and shown in the form of another graph.

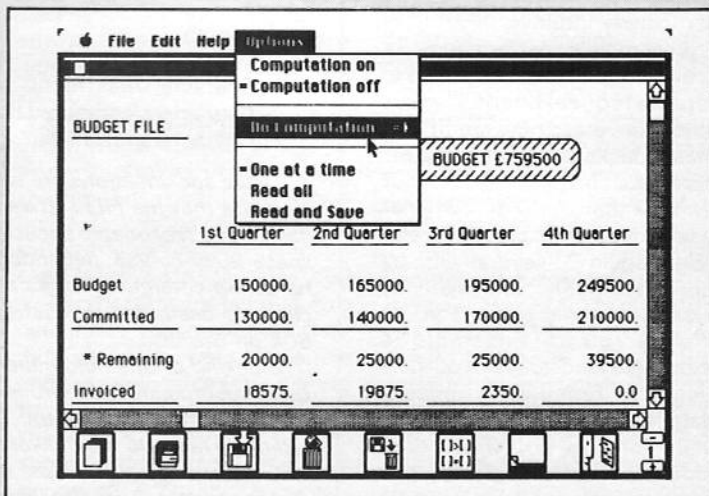
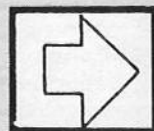


Figure IV: This is the closest Ensemble gets to looking like a real spreadsheet – the "remaining" figures were computed automatically



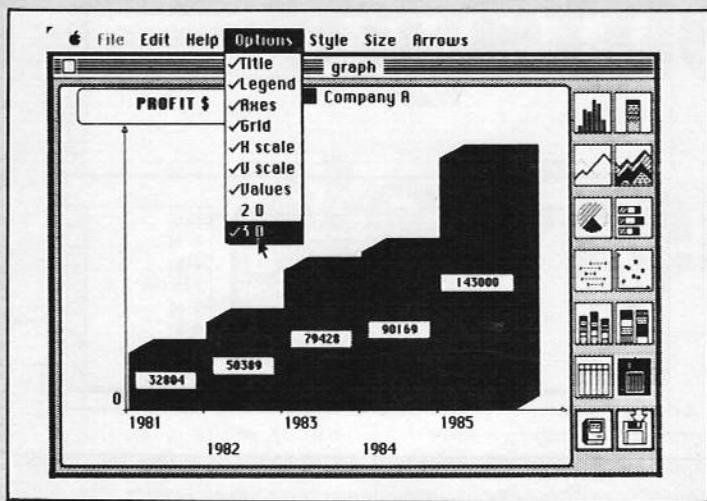


Figure V: A 3D graph with other nine chart options shown in right hand icons

One major let-down is that, astonishingly, the graph feature doesn't have a print option — you have to make a copy and paste it into a report! You can also dump the screen direct to printer.

Contrast this with Microsoft Charts' ability to scale print according to page size and also allow extensive personalised customising. Apart from the usual bar, pie and scatter chart designs, Ensemble, true to nature, has several interesting odd-balls.

The balance sheet graph pulls in basic figures like cash, stock and capital, then produces two unique vertical stacked bar charts showing assets and liabilities (see Figure V).

Another feature is the Gantt graph, useful for scheduling projects, while an accounts chart compares relationships between groups of accounting information. Most options allow conversion from 2D to 3D.

Ensemble was clearly brought out to fill a perceived notch in the market and is one of the few so-called integrated packages to work in 128k.

However, I ran out of memory several times on my standard Mac when attempting to load some of the larger example templates.

When considering integrated programs, one priority is that all operating commands should be consistent and hopefully reduce the inevitable greater learning

effort.

Secondly, it's fair to judge each part of a suite of programs in direct comparison with the standard set by good dedicated packages.

Ensemble passes the first test but fails miserably at the second. This is a pity as the database is reasonably powerful, would satisfy most small business users and copes with picture graphics as a bonus.

Unfortunately the claimed word processing, spreadsheet and business chart functions appear limited add-ons lacking the facilities and capabilities of, say, MacWrite, Multiplan and Chart. The learning curve is also steep — not helped by the icons which are small and not particularly intuitive.

Ensemble's performance is probably par for the course. Integrated software's most ardent devotees now admit that these packages are too complicated.

Now that the Mac Switcher has arrived solo programs can reign again — several can be opened together and instantly swapped in and out of use.

At £299.95 Ensemble is expensive and unless you particularly fancy the unusual database and can live with the limitations, is not worth considering in the light of the competition.

Chris Burrige

Microsoft File has the right form



THE earlier shortage of Macintosh software has to a large extent been resolved and the problem for users is no longer "where can I find software to..." but "which is the best package for..."

To my knowledge there are at least 10 database packages for the Macintosh. Having neither the time nor resources to conduct an exhaustive survey of these packages, I opted to use Microsoft File.

My reasons were simple enough — other Microsoft products for the Macintosh had performed well, a brief demonstration convinced me that it would meet most of my needs and it made extensive use of the ability of the Macintosh to transfer information between different applications.

My specifications for a data-

base were slightly unusual in that I did not require extensive reporting, calculations, password protection etc. Primarily, I intended to use the database for maintenance of files of literature references.

A typical research project in any laboratory requires knowledge of several hundred original papers describing related research. A file of references rapidly becomes unwieldy on a card index and any sort of extensive cross referencing is virtually impossible.

The large scale bibliographic databases such as Medline provide such facilities over the whole of the biomedical literature; here the problem is that even a highly restricted search tends to be all inclusive, generating large numbers of

Datafile:

Record/datafile	65,535
Fields/record	1,023
Characters/field	32,767

Form:

Length	455 inches
Width	455 inches
Characters/field name	31
Characters/computed field	255
Characters/text label	32,767

These specifications are rather meaningless, other than to illustrate that the File software is unlikely ever to restrict the design of a reasonable application. Usage of memory and disc space is, of course, dependent upon the application and the hardware configuration. As a working example, a file of 250 citations used here to illustrate the software occupies about 80k on the disc.

Indexing of one field generates an index file of 10k. All of these records are held within memory on a 512k Macintosh, but not on a 128k system. Thus, sorting and searching are relatively fast and require very little disc access. Sorting of the 250 records on two fields, neither being indexed, took less than a minute. Times for searching are less.

Table 1: Specification of File

superfluous citations.

What we needed within the context of the laboratory was a system for maintaining the file of citations that we had pre-selected as being of interest. Ideally we would be able to use keyword searching designed to suit our own applications and include an abstract that defined the points of interest to us, rather than to the author of the paper.

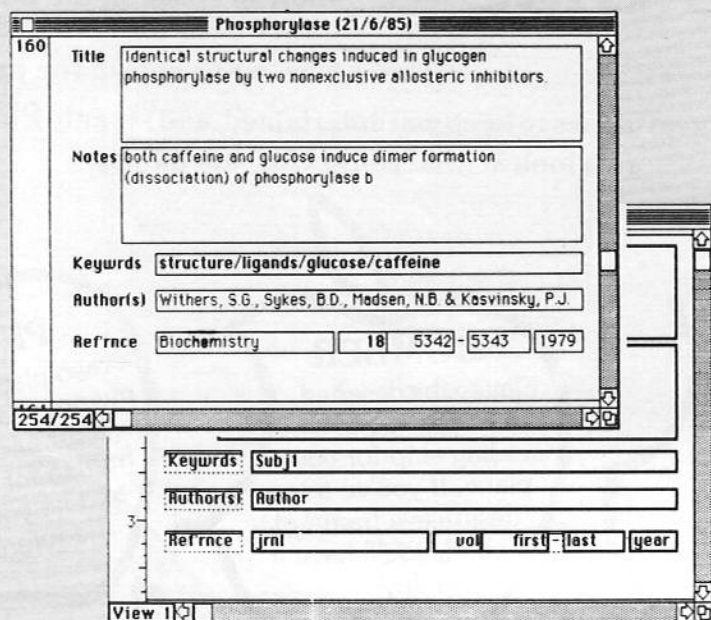
My reading about File suggested that it offered facilities that were appropriate to these needs. In addition to being able to handle the application described above, I was looking for a clean form design, flexibility in field size and an attractive, simple interface that could be used by other researchers as well as myself. Previously, I had attempted to use the Apple II product DB Master for this application, but I had found that the user-interface was tedious if robust.

I was therefore pleasantly surprised when I came to use File. This software is well designed and is delightful to use for such aspects as form design, searching and sorting. In the remainder of this article I will describe some of the facilities within the context of the citation database. I have little or no experience with other database managers for the Macintosh and my review must be seen as necessarily subjective.

File is not a relational database manager and offers manipulation of no more than one database at a time. The File software, extensive help files and system software occupy the large part of the 400k available on a single disc.

As far as I can ascertain from the manual, databases cannot be larger than the capacity of a single disc. Thus a second drive will almost certainly be needed for all respectable operations.

The limitations of 400k/database is not as restrictive as it sounds, as File allocates disc space dynamically (more later). I have no information on the behaviour of File on a hard disc, other than to repeat the statement in the manual that File can be mounted on hard disc.



160

Title: Identical structural changes induced in glycogen phosphorylase by two nonexclusive allosteric inhibitors.

Notes: both caffeine and glucose induce dimer formation (dissociation) of phosphorylase b

Keywords: structure/ligands/glucose/caffeine

Author(s): Withers, S.G., Sykes, B.D., Madsen, N.B. & Kosvinsky, P.J.

Reference: Biochemistry 18 5342-5343 1979

254/254

Keywords: Subj1

Author(s): Author

Reference: Jrn1 vol first last year

View 1

Figure 1: Form design and example entry

The copy protection is typical of Microsoft products for the Macintosh. The disc can be duplicated but the master must be inserted briefly into the system before the copy will execute correctly.

File supports the 10in and 15in Imagewriter printer and a new printer driver is included that also allows a 50 per cent reduction in any image that is printed. This driver can be used in any Macintosh application.

In common with other Microsoft applications, the mouse and pull-down menus are used intelligently. Many commands are backed up by command key options and the normal Macintosh keys are retained – cut, copy, paste and so on.

Incidentally, I have never understood the furore over Apple's choice of command keys for those operations – try C for copy, X (a pair of scissors?) for cut and V (an insertion caret?) for paste.

Database users fall into two categories, those who like their data all printed on a single line and those who like screen-sized forms. File caters for both of these requirements by the simple expedient of switching on or off a facility called List Helper. When this facility is selected the database consists

of a series of fields laid out horizontally, all of the same number of lines of text deep, and File is essentially acting as a list processor. Without List Helper selected the user is given complete freedom over field position, size and type.

Forms many times larger than the screen can be designed (Table 1) but this requires scrolling through the form to read all of the contents and slows down the use of the database. In the example below I have designed a form that is just smaller than a screenful of information.

Whether or not List Helper is operating, the design of the database is essentially the design of the form dictating the information that is to be stored. Figure 1 shows the form design and an example entry as it appears when the database is used.

Fields are sized, positioned and typed as required.

Note that picture fields containing Macpaint images can be created. If this option is chosen the pasted image can either be clipped or scaled to suit the size of the field. Any number of fields can be indexed to allow for faster searching on those fields – the index is stored as a separate file on disc and

thus a full disc may not permit extensive indexing.

An attractive feature of File is that every form has two views. The second view of the citation database, underlying the Organise menu is shown in Figure 11. In this view I have chosen to display only the title and keyword field for rapid browsing through the database at 7 records/page rather than 1 record/page with the full screen view.

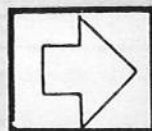
Switching between the two views is simple, either enter Command-T (toggle) or double-click in the record number area. Compare the two views of record 160 (Figure 1 and Figure 11). In the shorter view many of the fields are concealed by dragging them into the "hide" area that is also used to size the complete record – all of this is much easier to do than to describe.

Form designs may be saved with the database or separately and any number of forms can be used to present data from the same database. This is an attractive feature that allows optimal presentation of the data for different needs.

Once a form has been designed – and apart from field types, any aspect of the form can be changed at will in the future – data can be entered. I prefer to place boxes around the fields, as it helps in data entry. Note the use of different fonts, justification options and the use of a label (a hyphen) to delineate the first and last pages of the reference (Figure 1).

Many databases require the maximum length of a field to be specified when the database is created. This can result in wasted bytes if most of the entries in this field are padded with blanks. File allocates space dynamically, according to the contents of the field. The maximum number of characters in a field is 32,767.

To illustrate, I estimate that the citation file will hold between 1,000 and 1,200



apple user games disc

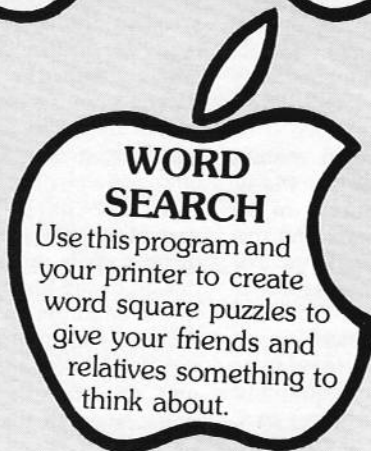
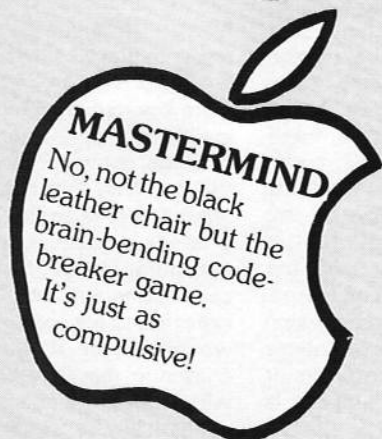
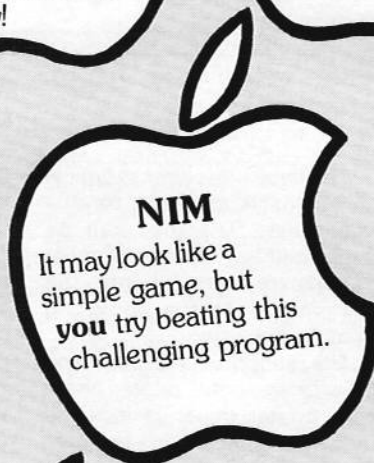
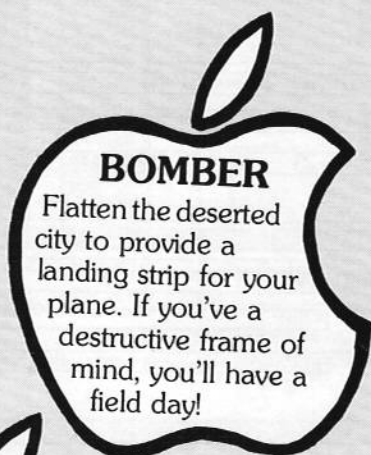
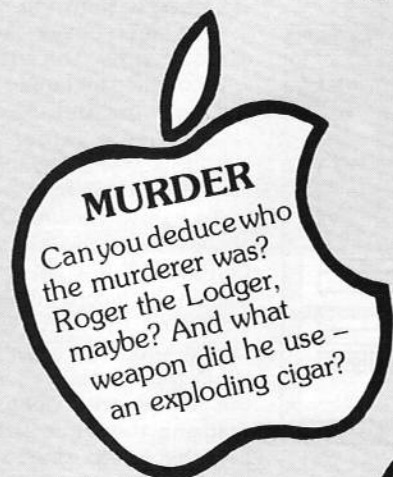
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To order, use the form on Page 61

MacReview

records on a 400k disc. Thus data can be entered to any realistic length but, of course, the window established in the form will not be large enough to display all of this data.

File caters for this beautifully. Instead of being obliged to enlarge the window by re-designing the form, when the data is entered it scrolls leftwards. When entry into that field is terminated the text jumps back to show the beginning of the entry (Figure II).

Viewing an "overfilled" window is simplicity itself - select the text in the window and drag to the left or right, the text will be scrolled to the right or left respectively. The further that the mouse is dragged outside the field the faster the text scrolls.

This option is a boon where for example citations may have between one and 10 authors. Not only is disc space allocated efficiently but it is unnecessary to design a form that displays the maximal amount of data.

Simple options are available to copy the contents of a field from the previous record, to add the time or date (from the Macintosh clock) and to move between the same field in different records. All of these options make for comfortable use of the database.

At frequent intervals File saves the data that has been entered without user intervention. This usually happens after a period of inactivity at the keyboard or mouse and rarely interrupts use of the database.

When a series of records have been entered they are organised haphazardly and the user will need to access them according to specific requirements. Here the Organize menu is used (Figure II). To find records that meet a set of criteria a blank form is displayed and the information needed is entered into the relevant fields. An extensive set of searching options is permitted, including wildcards and range searching.

In the citation database described here we routinely conduct most searches on the keyword field or the author field, thus *cofactor* will find all occurrences of that set of

characters irrespective of position in the keyword field and *madsen* will find all papers by that person, irrespective of whether he is first author or not. The search is not case-sensitive.

When a set of records are found that meet the criteria they are accessed as a subfile of the main database, the fraction at the bottom left of the screen (Figure II) will change to n/254 if n records are found. All further operations (printing, further searching, sorting) are conducted on this subfile. An option is provided to allow a set of records to be hidden and as expected, the complete database is brought to the "front" by the Show All Records option.

Sorting is conducted in a similar fashion to finding records - a blank form is displayed and the field to be sorted, their order in the sort and the type of sort, ascending or descending, is selected in this window.

Either the whole database or the subfile can be printed as individual records, with or without gridlines or record numbers. Additionally the mailing label option allows a set of single line fields to be printed in

a format suitable for labels.

The reporting options of File are restricted to the horizontal layout of a series of fields, any number of which may be sorted. The reporting facilities allow summary fields that include

simple arithmetic and statistics. In general, this is not an option that I have used extensively.

Figure III illustrates a minimal report for the citation database, consisting of year, sorted in descending order, title of the publication and my notes. I picked a small font to reduce the amount of paper that would be created by printing out the database.

A report such as this would only be used to conduct quick searches for papers of interest, the complete database would be needed to obtain further information.

As with all other types of output, a report can be saved in text-only format and may be merged into MacWrite or Word, the fields separated by tabs. This is useful in my application as I can prepare a set of citations for publication and merge them into a Word document.

Most publications require references in a different order to that shown in the form - author(s), year, title, journal, first page, last page. With File all that is required is to design a new form or report with the fields in this order and save, as textual output, the selected records in the format specified.

Robert J. Beynon

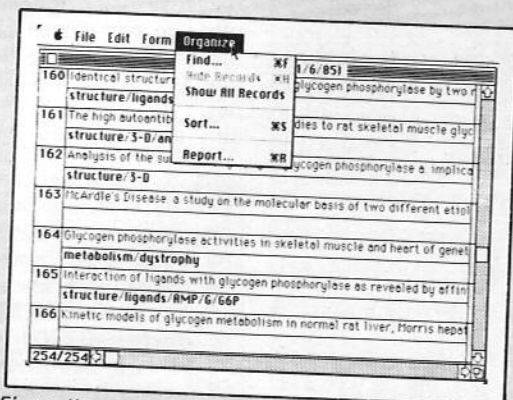


Figure II

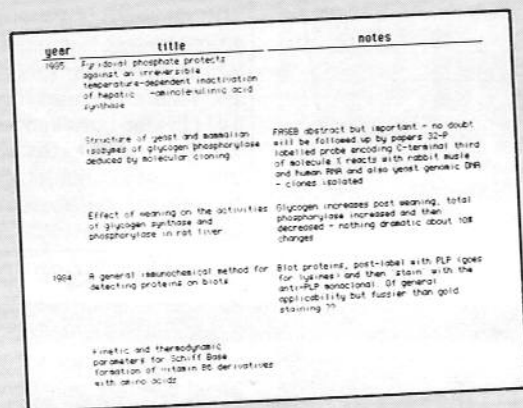


Figure III

FILE has met my needs of a general purpose database for handling of textual, structured information such as citations, indices of life-science software and simple mailing lists. The lack of password protection, relational capabilities and the limited file size would be irksome to certain types of users. I do not need these facilities, and have found that File is an excellent example of Macintosh software that works reliably, is flexible and easy to use.

I do not agree that the List Helper option simplifies design of the database, and would prefer to see some way of protecting existing full screen forms

from inadvertent selection of this option (which converts a nicely designed form into a series of columns).

Admittedly, one can always reload the form, but this is not obvious and it is disconcerting to see an attractive, carefully designed form vanish. The excellent flexibility in form design allows the appearance and contents to be changed, virtually at will - with this control who needs list processing?

I can recommend that anyone looking for a general purpose database should spend time studying File - it is a rare piece of software that has yet to disappoint.

Putting those compression techniques to work with a form generator and database

THE theme of this month's article is a working model of a database using the data compression techniques previously discussed. It can be used as it stands, but is intended as a basic database module, which can be expanded and cus-

tomised to fulfil individual requirements.

To simplify the task of modifying it to suit a particular purpose, the program is written in a very modular style, with the accent on legibility rather than compactness, and entry points

1. Any printable character.
2. Upper case, lower case, space, digits.
3. Upper case, lower case, space.
4. Upper case, space.
5. Integer 0 to 32767.
6. Integer -32767 to +32767.
7. Floating point number (coded as string).
8. Yes/no (single-stroke entry Y or N).
9. Male/female (single-stroke entry M or F).
10. [unused].
11. [unused].
12. Long integer (only positive values, maximum 29 bits).
13. Title on screen (no input).
14. Divider between screens (see text).
15. Pointer (2 bytes saved on disc, but not displayed on screen. Intended for internal workings of special purpose database, for example to point to location in other files.

Table 1: &DOSFILE data types

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are marked for special-purpose programming.

Both the form generator section and the main database use the same routines and function in the same way – as explained last month, a form generator is a special kind of database.

In the add field/record mode a sequence of fields is shown in turn, each consisting of texts

**By
PETER
HARRIS**

presented at specified points on the screen, inviting an input from the user.

Limits are set on the user input, both in respect of maximum length and in respect of allowable characters, for example digits only. In the view/edit mode a screenful of fields is presented. If there are more fields than can be shown in one screen it is possible to spread them over several screens and to switch between them.

Both the data input and edit routines make use of data held in two arrays FD%() and FD\$() – see Table II. In the form generator mode these arrays are filled by READING in from DATA statements. In the database mode the arrays are filled from data stored on disc.

The form generator module has been written to use as few extra program lines as possible. It is therefore intended for use by a programmer making up a special-purpose database rather than by an inexperienced computer user who would be stuck for an answer when presented with the form generator prompts:

1. Field name. The permitted response to this is a text line up to 25 characters long, which is used by the database

section as a prompt.

2. Line. The answer should be an integer between 2 and 24, and specifies the line on the screen at which the prompt should appear. Line 1 is reserved for system prompts.

3. Column. The answer specifies the column in which the first character of the prompt should appear, and should therefore be an integer between 1 and 40 for 40 column screen working or 80 for 80 column screens.

4. Type. The answer should be a number specifying the type of answer (by reference to table I) which is permitted by the database module for that field. In general typing serves to restrict the nature of characters which can be entered when using the database, say only digits allowed, which decreases the risk of entering wrong data. It also enables the system to calculate the minimum number of bits required to store the input data.

If a field is characterised as type 14 (divider type), the screen display routines (lines 1000-1320) interpret this as a signal to set up separate screens of fields, rather than displaying them all at once. This is a very useful feature in a large record.

5. Maximum number of characters. The answer establishes the maximum length of the response to a prompt.

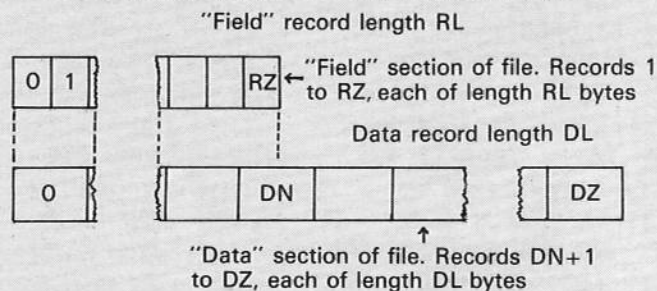
6. Maximum numeric value. This question is only relevant when the type allows a numeric input, in which case the answer to question 6 is used to calculate the number of bits required to store that field. In the case of other types, the answer is ignored, and the calculation made from the maximum number of characters (question 5) and the type (question 4).

Variables related to field positioning and type

Variable	Usage
FD\$(FF)	field text string.
FD%(1,FF)	line.
FD%(2,FF)	column.
FD%(3,FF)	type (see Table I).
FD%(4,FF)	max no. of chars in answer.
FD%(5,FF)	no. of bits used to store answer.

FF is the current field variable, with a value between 1 and the maximum number of fields.

Variables related to data stored on disc



Format of record 0

Bytes	Variable	Usage
0-1	RZ	no. of fields in record used in form generator
2	RL	"field" record length
3-4	DN	last data record overlapped by "field" section of file
5	DL	"data" record length.
6-7	DZ	last record in use.
8-9	ID	code value identifying file as belonging to &DOSFILE system.
10-11	DB	no. of bits in record (<DL*8)

Table II: Program variables

Storage on disc is in a very compact form (Table II). The data files are catalogued as text fields. Records 1 to RZ, where RZ depends on the number of fields, have a fixed length RL (26 bytes in the current form generator version). They contain the output from the form generator and are fed into the database module to establish the screen layout.

The database records proper then follow. The length of these records DL depends on the amount of data in a record, and so varies greatly between files. Parameters such as record length, and number of records stored, which are vital to data management in the program, are all stored in record 0. A code value is also stored here to identify files as belonging to the &DOSFILE system.

The program was written for an Apple II+ with an 80 column card. The necessary modifications for other Apples are shown in Table III. A few extra

program statements have been incorporated to deal with some minor bugs in the machine code, the most notable one being the inability of the &K command to deal with null strings. A summary of the fixes will be given next month.

appletip

i If you don't want anyone to be able to catalog your disc, POKE -23186, 96, and initialise a new disc using this modified DOS.

This is the beginning of the Catalog routine, and a 96 (Return from subroutine) forces DOS to ignore that routine.

If you want to use the Catalog routine later, POKE -23186, 169.

These modifications can also be made by a boot program.

Ted Mounsteven

80 column screen	40 column screen
PRINT CLS\$	HOME
PRINT IV\$	INVERSE
PRINT NO\$	NORMAL
PRINT EOL\$	CALL -868
PRINT HO\$	HTAB 1:VTAB 1

II+ IIe
FW=21 FW=32 (cf. line 50010)

Table III: Modifications for various configurations

```

10 GOTO 10000: REM &DOSFILE
    program 1.3
90 REM
    Idiot-proof input
    routine
100 GOSUB 190: REM First
    character
110 FOR N = 0 TO 1
120 GET A$:A = ASC (A$)
130 IF FN OK(A) AND LEN
    (F$) < MAX THEN F$ = F$ +
    A$: PRINT A$;
140 IF A = 8 THEN GOSUB
    160:A = FRE (0)
150 N = (A = 13): NEXT :N =
    FRE (0): RETURN
160 PRINT A$ " A$;
170 IF LEN (F$) < > 1
    THEN F$ = LEFT$ (F$, LEN
    (F$) - 1): RETURN
190 GET A$:A = ASC (A$)
200 IF NOT ( FN OK(A) + (A
    = 13)) THEN 190
220 IF A < > 13 THEN F$ =
    A$: PRINT A$;: RETURN
230 F$ = "": POP : RETURN
240 REM
    Data input
    validation
250 DEF FN OK(A) = A > 31
    AND A < 127: GOSUB 100:
    RETURN : REM Type 1. Any
    printable char
251 DEF FN OK(A) = (A > 64
    AND A < 91) + (A > 96 AND
    A < 123) + (A > 47 AND A
    < 58) + (A = 32): GOSUB
    100: RETURN : REM Type 2.
    Upper case,lower
    case,digits + space
252 DEF FN OK(A) = (A > 64
    AND A < 91) + (A > 96 AND
    A < 123) + (A = 32):
    GOSUB 100: RETURN : REM
    Type 3. Upper case,lower
    case + space
253 DEF FN OK(A) = (A > 64
    AND A < 91) + (A = 32):
    GOSUB 100: RETURN : REM
    Type 4. Upper case
    chars + space
254 DEF FN OK(A) = A > 47
    AND A < 58: GOSUB 100:
    RETURN : REM Type
    5. Digits
256 DEF FN OK(A) = (A > 47
    AND A < 58) + (A = 43) +
    (A = 45): GOSUB 100:
    RETURN : REM Type 6.
    Digits,+,-
270 DEF FN OK(A) = (A > 47
    AND A < 58) + (A = 43) +
    (A = 45) + (A = 46) + (A
    = 69) + (A = 94): GOSUB
    100: RETURN : REM Type 7.
    Floating point numeric
271 FOR N = 0 TO 1: GET
    F$:F = ASC (F$): REM
    Type 8. Yes/no (Y/N)
272 N = (F = 78) + (F = 89)
    + (F = 110) + (F = 121)
274 Y = (F = 89) + (F =
    121): NEXT : REM Yes=1
276 F$ = CHR$ (F - 32 * (F
    > 90)): PRINT F$: RETURN
278 FOR N = 0 TO 1: GET
    F$:F = ASC (F$): REM
    Type 9. Male/female (M/F)
280 N = (F = 78) + (F = 77)
    + (F = 102) + (F = 109)
282 MX = (F = 77) + (F =
    109): NEXT : REM Male=1
284 F$ = CHR$ (F - 32 * (F
    > 90)): PRINT F$: RETURN
286 RETURN : REM Type 10
288 RETURN : REM Type 11
289 DEF FN OK(A) = A > 47
    AND A < 58: GOSUB 100:
    RETURN : REM Type
    12. Long integer
290 PRINT " ": RETURN : REM
    Type 13. Title
292 PRINT CLS$: RETURN :
    REM Type 14. Divider
294 RETURN : REM Type 15.
    Pointer
350 REM
    Bit values of
    input data --> LINE or
    CLINE
360 IF LEN (OUT$(FF)) =
    FD$(4,FF) THEN RETURN
370 FOR F = LEN (OUT$(FF))
    + 1 TO FD$(4,FF): REM Pad
    out string for
    comparisons
380 OUT$(FF) = OUT$(FF) +
    CHR$ (0): NEXT : RETURN
390 GOSUB 360
391 & E,L2,0,OUT$(FF): REM
    Types 1,2,3,7
392 L2 = L2 + FD$(4,FF) * 7:
    RETURN
    RETURN
393 GOSUB 360
394 & E,L2,1,OUT$(FF): REM
    Type 4
395 L2 = L2 + FD$(4,FF) * 5:
    RETURN
396 OUT$ = VAL (OUT$(FF)):
    & E,L2,FD$(5,FF),OUT$:
    REM Types 5,6,15
397 L2 = L2 + FD$(5,FF):
    RETURN
398 GOSUB 360
399 POKE L2,OUT$(FF) = "Y":
    REM Type 8
400 L2 = L2 + 1: RETURN
401 POKE L2,OUT$(FF) = "M":
    REM Type 9
402 L2 = L2 + 1: RETURN
403 RETURN : REM Type 10
404 RETURN : REM Type 11
405 OUT = VAL (OUT$(FF)):
    REM Type 12
406 Q1% = INT (OUT /
    32768):Q2% = OUT - Q1% *
    32768
407 L3 = FD$(5,FF) - 15
408 & E,L2,L3,Q1%: & E,L2 +
    L3,15,Q2%
409 L2 = L2 + FD$(5,FF):
    RETURN
410 RETURN : REM Types
    13,14
550 REM
    Data transfer from
    LINE to variables
560 &
    K,L2,0,OUT$(FF),FD$(4,FF):
    REM Types 1,2,3,7
562 IF LEN (OUT$(FF)) >
    FD$(4,FF) THEN OUT$(FF) =
    "": REM Bug in &K with
    null string
565 L2 = L2 + FD$(4,FF) * 7:
    RETURN
570 &
    K,L2,1,OUT$(FF),FD$(4,FF):
    REM Type 4
572 IF LEN (OUT$(FF)) >
    FD$(4,FF) THEN OUT$(FF) =
    "": REM Bug in &K with
    null string
575 L2 = L2 + FD$(4,FF) * 5:
    RETURN
580 & K,L2,FD$(5,FF),OUT$:
    REM Types 5,6,15
585 OUT$(FF) = STR$ (OUT$)
590 L2 = L2 + FD$(5,FF):
    RETURN
595 OUT$(FF) = "N": IF PEEK
    (L2) THEN OUT$(FF) = "Y":
    REM Type 8
600 L2 = L2 + 1: RETURN
605 OUT$(FF) = "F": IF PEEK
    (L2) THEN OUT$(FF) = "M":
    REM Type 9
610 L2 = L2 + 1: RETURN
615 RETURN : REM Type 10
620 RETURN : REM Type 11
625 L3 = FD$(5,FF) - 15: REM
    Type 12
630 & K,L2,L3,Q1%: & K,L2 +
    L3,15,Q2%
635 OUT$(FF) = STR$ (Q1% *
    32768 + Q2%)
640 L2 = L2 + FD$(5,FF):
    RETURN
645 RETURN : REM Types
    13,14
690 REM
    Position field
    title
700 PRINT : VTAB FD$(1,FF):
    POKE 36,FD$(2,FF)
710 IF F2 = FF THEN PRINT
    IV$;
720 PRINT FD$(FF);NO$ " ";:
    RETURN
730 REM
    Highlight new
    field
740 FF = F3: GOSUB 700:F3 =
    F2
750 FF = F2: GOSUB 700:
    RETURN
760 REM
    Input single field
    after clearing previous
    entry
770 MAX = FD$(4,FF): FOR L =
    1 TO MAX: PRINT CHR$
    (95);: NEXT
780 FOR L = MAX TO 1 STEP
    - 1: PRINT CHR$ (8);:
    NEXT
790 ON FD$(3,FF) GOSUB
    250,251,252,253,254,256,27
    0,271,278,286,288,289,290,
    292,294
810 OUT$(FF) = F$: PRINT :
    RETURN
820 REM
    Data input from

```

```

keyboard
830 PRINT CLS:F2 = 0: FOR
    FF = 1 TO RN
840 GOSUB 700: GOSUB 770:
    NEXT
850 RETURN
860 REM
    Display current
    field/record
870 F2 = 0
880 PRINT CLS: FOR FF = S1
    TO S2: GOSUB 700
890 IF FDX(3,FF) < 13 THEN
    PRINT OUT$(FF)
900 PRINT : NEXT : RETURN
910 REM
    Compress data and
    store in WRBUF
920 L2 = LINE: & Z: FOR FF =
    1 TO RN
930 ON FDX(3,FF) GOSUB
    391,391,391,394,396,396,39
    1,399,401,403,404,405,410,
    410,396
940 NEXT : & J: RETURN
950 REM
    Expand RDBUF into
    variables, via LINE
960 & S:L2 = LINE: FOR FF =
    1 TO RN
970 ON FDX(3,FF) GOSUB
    560,560,560,570,580,580,56
    0,595,605,615,620,625,645,
    645,580
980 NEXT : RETURN
990 REM
    Display another
    screen
1000 FOR N5 = 0 TO 1
1010 PRINT HO$EOL$"<- or ->
    next screen,RETURN to
    leave ";
1020 GET A$:A = ASC (A$)
1030 IF A = 8 THEN GOSUB
    1080: GOSUB 870
1040 IF A = FW THEN GOSUB
    1120: GOSUB 870
1050 N5 = (A = 13): NEXT :
    RETURN
1080 S2 = S1 - 2: IF S2 < 1
    THEN S2 = RN: REM Back 1
    screen
1090 FOR SS = S2 TO 1 STEP
    - 1
1100 S1 = SS: IF FDX(3,SS) =
    14 THEN S1 = SS + 1:SS =
    1
1110 NEXT : RETURN
1120 S1 = S2 + 1: IF S1 > RN
    THEN S1 = 1: REM Forward
    1 screen
1130 FOR SS = S1 TO RN:S2 =
    SS
1140 IF FDX(3,SS) = 14 THEN
    SS = RN
1150 NEXT : RETURN
1160 A = FW: FOR N5 = 0 TO
    1: GOSUB 1260
1170 FOR N6 = 0 TO 1: GET
    A$:A = ASC (A$)
1180 N6 = (A = 8) + (A = FW)
    + (A = 13): NEXT
1190 F2 = F2 - (A = 8) + (A
    = FW)
1200 IF NOT (F2 < S1 OR F2
    > S2) THEN GOSUB 1280
1210 IF F2 > S2 THEN GOSUB
    1120:F2 = S1:F3 = S1:
    GOSUB 880: GOSUB 1260
1220 IF F2 < S1 THEN GOSUB
    1080:F2 = S2:F3 = S2:
    GOSUB 880: GOSUB 1260
1230 GOSUB 740
1240 N5 = (A = 13): NEXT
1250 FF = F2:COMP(F2) = 1:
    GOSUB 770: RETURN
1260 PRINT HO$EOL$IV$"<- or
    -> selects entry,RETURN
    confirms ";NO$;
1270 GOSUB 1280:F3 = F2:
    GOSUB 740: RETURN
1280 FOR N6 = 0 TO 1
1290 IF FDX(3,F2) > 12 THEN
    F2 = F2 - (A = 8) + (A =
    FW)
1300 N6 = (F2 < S1) OR (F2 >
    S2) OR (FDX(3,F2) < 13)
1320 NEXT : RETURN
1990 REM
    Open data file,
    get parameters from
    record 0
2000 & O(FI$): & N(0): & R
2010 C1 = FN IT(RDBUF + 8):
    IF C1 < > ID THEN & C:
    RETURN : REM
    Inappropriate file
2020 RZ = FN IT(RDBUF):RL =
    PEEK (RDBUF + 2)
2030 DN = FN IT(RDBUF +
    3):DL = PEEK (RDBUF + 5)
2040 DZ = FN IT(RDBUF + 6)
2050 DB = FN IT(RDBUF +
    10): RETURN
2060 REM
    Update record 0
2070 & N(0): IF PEEK
    (RECLN) > RL THEN &
    R(FI$): & P: REM Avoid
    corrupting record 1
2080 POKE WRBUF, FN
    LOBYTE(RZ)
2090 POKE WRBUF + 1, FN
    HIBYTE(RZ)
2100 POKE WRBUF + 2,RL
2110 POKE WRBUF + 3, FN
    LOBYTE(DN)
2120 POKE WRBUF + 4, FN
    HIBYTE(DN)
2130 POKE WRBUF + 5,DL
2140 POKE WRBUF + 6, FN
    LOBYTE(DZ)
2150 POKE WRBUF + 7, FN
    HIBYTE(DZ)
2160 POKE WRBUF + 8, FN
    LOBYTE(ID)
2170 POKE WRBUF + 9, FN
    HIBYTE(ID)
2180 POKE WRBUF + 10, FN
    LOBYTE(DB)
2190 POKE WRBUF + 11, FN
    HIBYTE(DB)
2200 IF NOT FR OR (DL > =
    12) THEN & W(FI$):
    RETURN
2210 & C(FI$): POKE
    RECLN,12: & O(FI$): &
    W(FI$): REM Alter record
    length
2220 & C(FI$): POKE
    RECLN,DL: & O(FI$):
    RETURN
2490 REM
    Add field/record
2500 IF NOT FR AND DZ THEN
    GOSUB 61200: IF NOT Y
    THEN RETURN
2505 FOR N4 = 0 TO 1: GOSUB
    830: ON FR + 1 GOSUB
    2570,2730
2510 GOSUB 920
2520 & N(LN): & W(FI$):LN =
    LN + 1
2530 PRINT CLS$*Last "FR$"
    no: ";LN - 1 - FR * DN:
    PRINT : PRINT "Add
    another "FR$"? (Y/N) ";
2540 GOSUB 271:N4 = NOT Y:
    NEXT
2550 GOSUB 2070: RETURN :
    REM Update record 0
2560 REM
    Special
    processing of fields
    before storing
2570 RZ = LN: GOSUB 2580:
    RETURN
2580 IF VAL (OUT$(3)) < 2
    THEN OUT$(3) = "2"
2581 IF VAL (OUT$(3)) > 24
    THEN OUT$(3) = "24"
2583 IF VAL (OUT$(4)) < 1
    THEN OUT$(4) = "1"
2584 IF VAL (OUT$(4)) > 80
    THEN OUT$(4) = "80": REM
    For 80-column screen
2589 ON VAL (OUT$(5))
    GOSUB
    2630,2630,2630,2640,2650,2
    680,2630,2690,2690,2700,27
    10,2650,2720,2720,2680
2590 OUT$(7) = STR$(NB):DB
    = DB + NB
2600 D2 = INT (DB / 8) +
    NOT DL:DL = D2 + (D2 * 8
    < DB)
2610 D2 = INT ((RZ + 1) *
    RL / DL):DN = D2 + (D2 *
    DL < > (RZ + 1) * RL)
2620 DZ = 0: RETURN
2625 REM
    NB=no. of bits
    reqd.
2630 NB = VAL (OUT$(6)) +
    7: RETURN : REM Types
    1,2,3,7
2640 NB = VAL (OUT$(6)) +
    5: RETURN : REM Type 4
2650 P1 = VAL (OUT$(7)):
    REM Types 5,12
2660 NB = 0: FOR N5 = 0 TO
    1:NB = NB + 1
2670 P2 = 2 ^ NB:N5 = (P2 >
    P1): NEXT : RETURN
2680 NB = 16: RETURN : REM
    Types 6,15
2690 NB = 1: RETURN : REM
    Types 8,9
2700 RETURN : REM Type 10
2710 RETURN : REM Type 11
2720 NB = 0: RETURN : REM
    Types 13,14
2725 REM
    Special

```

```

processing of records
before storing
2730 DZ = LN
2740 REM Further special
processing here
2750 RETURN
2990 REM
View/edit
field/record
3000 PRINT CLS$:R = RZ: IF
FR THEN R = DZ - DN
3010 IF R < 1 THEN R = 0:
GOSUB 61060: RETURN: REM
Nothing there
3020 IF R = 1 THEN LL = 1:
GOSUB 61060: GOSUB 3060:
RETURN
3030 VTAB 10: HTAB 5: PRINT
FR$ no. (1-"R") ";
3040 MAX = 4: GOSUB 254:LL =
VAL (F$) + NOT VAL (F$)
3050 IF LL > R THEN GOSUB
61060: RETURN
3060 & N(LL + DN * FR): &
R(FI$)
3070 GOSUB 960: ON FR + 1
GOSUB 3230,3290
3080 S2 = RN: GOSUB 1120:
GOSUB 870: IF S2 < RN
THEN GOSUB 1000
3090 PRINT HO$EOL$"Edit
"FR$ no."LL"? (Y/N) ";:
GOSUB 271
3100 IF NOT Y THEN RETURN
3110 F2 = S1: FOR N4 = 0 TO
1: GOSUB 1160
3120 PRINT HO$EOL$"Edit
another entry in "FR$
no. "LL"? (Y/N) ";: GOSUB
271
3130 N4 = NOT Y: NEXT
3140 ON FR + 1 GOSUB
3150,3210: RETURN
3150 ON VAL (OUT$(5))
GOSUB
2630,2630,2630,2640,2650,2
680,2630,2690,2690,2700,27
10,2650,2720,2720,2680
3160 IF NB = BITS THEN
OUT$(7) = STR$(NB):
GOSUB 3210: RETURN
3170 Y = 1: IF DZ THEN
GOSUB 61200
3180 IF NOT Y THEN RETURN
3190 DB = DB - BITS: GOSUB
2580
3200 GOSUB 3210: GOSUB
2070: RETURN
3210 GOSUB 920: & W(FI$):
RETURN
3220 REM
Special
processing of fields
before viewing
3230 BITS = VAL
(OUT$(7)):OUT$(7) =
"--":TY = VAL (OUT$(5))
3240 IF TY = 6 THEN OUT$(7)
= "+/-32767"
3250 IF (TY = 5 OR TY = 12
OR TY = 15) THEN P2 = 2 ^
BITS - 1:OUT$(7) = STR$(
P2)
3260 RETURN
3280 REM
Special
processing of records
before viewing
3290 RETURN
4490 REM
Entry of data for
comparison
4500 FOR FF = 1 TO
RN:OUT$(FF) = "":COMP(FF)
= 0: NEXT
4510 S2 = RN: GOSUB 1120:
GOSUB 870: IF S2 < RN
THEN GOSUB 1000
4520 F2 = S1: FOR N4 = 0 TO
1: GOSUB 1160
4530 PRINT HO$EOL$"Another
entry? (Y/N) ";: GOSUB
271
4540 N4 = NOT Y: NEXT:
GOSUB 920
4550 L2 = CLINE: FOR FF = 1
TO RN
4560 IF COMP(FF) THEN ON
FDX(3,FF) GOSUB
390,390,390,393,396,396,39
0,399,401,403,404,405,410,
410,396
4570 IF NOT COMP(FF) THEN
ON FDX(3,FF) GOSUB
392,392,392,395,397,397,39
2,400,402,403,404,409,410,
410,397
4580 NEXT: & Y: & X(W,0,DL
- 1)(C,0,DL - 1): RETURN
4990 REM
Find record
5000 PRINT CLS$"Press
RETURN and enter data to
be matched ": GOSUB
61030: GOSUB 4500
5010 PRINT CLS$: IF NOT DZ
THEN R = 0: GOSUB 61060:
RETURN
5020 PRINT "Searching..."
5030 FOR LN = DN + 1 TO DZ:
& N(LN): & R(FI$): & X
5040 A$ = "": IF NOT PEEK
(D1) THEN GOSUB 5080
5050 IF PEEK (KBD) > 127
THEN GET A$
5060 IF A$ = ESC$ THEN LN =
DZ
5070 NEXT: RETURN
5080 GOSUB 960: GOSUB 3290:
GOSUB 870
5090 PRINT
HO$EOL$IV$"Record no. "LN
- DN". Press RETURN
"NO$;: GOSUB 61030
5100 PRINT HO$EOL$"RETURN
to continue search, ESC
to end ";
5110 FOR N4 = 0 TO 1: GET
A$
5120 N4 = (A$ = ESC$) OR (A$
= RT$): NEXT: RETURN
8990 REM
Menu display
9000 PRINT CLS$: IF FI$ <
">" THEN PRINT "File
"FI$;
9010 HTAB 5: VTAB 3: PRINT
IV$MENU$NO$
9020 C = M2 - M1 + 1: FOR ME
= M1 TO M2
9030 VTAB 5 + (ME - M1) *
2: PRINT ME - M1 + 1.
"ME$(ME): NEXT
9040 PRINT: PRINT " Choose
1-";C
9050 PRINT: PRINT "
(Press RETURN to confirm
choice) ";
9060 NS = 1: FOR N = 0 TO 1
9070 GET A$:A = VAL (A$)
9080 N = (A > = 1 AND A <
= C): NEXT: PRINT
9090 FOR N1 = 0 TO 1
9100 VTAB 3 + NS * 2: PRINT
NS". "ME$(NS + M1 - 1)
9110 VTAB 3 + A * 2: PRINT
IV$;A". "ME$(A + M1 -
1)NO$;
9120 NS = A: FOR N = 0 TO 1
9130 GET A$:A = VAL (A$)
9140 N = (A > = 1 AND A <
= C) + (A$ = RT$): NEXT
9150 N1 = (A$ = RT$): PRINT
: NEXT: RETURN: REM NS
holds choice
9190 REM
Get file name for
new database
9200 PRINT CLS$: VTAB 10:
HTAB 5: PRINT "Name of
file to be created"
9210 PRINT: PRINT "-->
";:MAX = 30:Y = 1
9220 GOSUB 250:FI$ = F$: &
V(FI$)
9230 IF PEEK (RTCODE) = 6
THEN GOSUB 9280: RETURN
: REM New file
9240 PRINT: PRINT: PRINT
"This file has already
been started. Continue?
(Y/N) ";
9250 GOSUB 271: IF Y THEN
GOSUB 2000
9260 IF C1 < > ID THEN
GOSUB 61050:Y = 0: REM
Unrelated file
9270 RETURN
9280 & O(FI$):RZ = 0:DN =
0:DZ = 0:DL = 0:DB = 0:
GOSUB 2070: RETURN
9290 REM
Get file name of
existing database
9300 PRINT CLS$: VTAB 10:
HTAB 5: PRINT "Name of
file to be reviewed"
9310 PRINT: PRINT "-->
";:MAX = 30:Y = 1
9320 GOSUB 250:FI$ = F$: &
V(FI$)
9330 IF PEEK (RTCODE) = 6
THEN & D(FI$): GOSUB
61050:Y = 0: RETURN: REM
No such file

```

```

9340 GOSUB 2000           :NS = 0: & C(FI$): RETURN
9350 IF C1 < > ID THEN 10140 REM
      GOSUB 61050:Y = 0: REM Database module
      Unrelated file      10150 GOSUB 9300: REM File
9360 RETURN              to be used
9370 REM                 10160 IF NOT Y THEN
      Establish           RETURN : REM Escape to
      database fields    main menu
9380 FOR FF = 1 TO RN: & 10170 RN = R2:R = RN: IF RN
      N(FF): & R(FI$): & S < 7 THEN R = 7
9390 &                   10180 GOSUB 50170: GOSUB
      K,LINE,0,FD$(FF),25:L2 = 9300
      LINE + 175         10190 & C(FI$): POKE
9400 FOR N = 1 TO 5      RECLN,DL: & O(FI$): REM
9410 & K,L2,FDX(0,N + Adjust record length
      2),FDX(N,FF):L2 = L2 + 10200 LN = DZ + 1: IF DZ = 0
      FDX(0,N + 2)       THEN LN = DN + 1
9420 NEXT : NEXT : RETURN 10210 FOR N3 = 0 TO 1
9990 REM                 10220 M1 = 11:M2 = 17:MENU$
      Start of main      = " Database menu ":
      programme         GOSUB 9000
10000 GOSUB 50000: REM 10230 FR = 1:FR$ = "record"
      Initialisation    10240 ON NS GOSUB
10010 M1 = 1:M2 = 5:MENU$ = 2500,61010,3000,61010,5000
      " Main menu ": GOSUB 9000 ,61010: REM Database
10020 ON NS GOSUB       routines
10060,10150,61010,61010: 10250 N3 = (NS = 7): NEXT
      REM Main modules  :NS = 0: & C(FI$): RETURN
10030 IF NS < > 5 THEN 49990 REM
      RUN : REM Hence Initialisation
      dimensioning of (36880) = 177 AND PEEK
      arrays!         (36881) = 0) THEN GOSUB
10040 PRINT CLS$: END 50210: REM See if DOSFILE
10050 REM              already loaded
      Form generator 50010 KBD = 49152:FW =
      module         21:RT$ = CHR$(13):ESC$
10060 GOSUB 9200: REM File = CHR$(27): REM FW=32
      to be started   on Apple //e
10070 IF NOT Y THEN    50020 DI = 0:RL = 26:ID =
      RETURN : REM ID is identifier
      Escape to      for appropriate files
      main menu     50030 CLS$ = CHR$(12):IV$
10080 LN = R2 + 1:RN = 7:R = = CHR$(15):NO$ = CHR$(
      RN: GOSUB 50170 (14):HO$ = CHR$(
10090 FOR N3 = 0 TO 1 (25):EOL$ = CHR$(29):
10100 M1 = 6:M2 = 10:MENU$ = REM control chars for
      " Form generator 80-col cards
      menu ":        50040 DIM ME$(17): FOR F =
      GOSUB 9000    1 TO 17: READ ME$(F):
10110 FR = 0:FR$ = "field" NEXT
10120 ON NS GOSUB      50050 DEF FN IT(A) = PEEK
      2500,61010,3000,61010: (A) + 256 * PEEK (A + 1)
      REM Formgen routines
10130 N3 = (NS = 5): NEXT
50060 DEF FN HIBYTE(A) = 60070 DATA View/Edit
      INT (A / 256)      record,Delete record
50070 DEF FN LOBYTE(A) = 60080 DATA Find
      - INT (A / 256) * record,Sort records
      256                60090 DATA Return to main
50080 REM              menu
      Load DOSFILE     60100 DATA FORM
      defaults into BASIC GENERATOR,3,13,13,0,0
      variables        60110 DATA Field
50090 WRBUF = FN       name,5,1,1,25,175
      IT(952):RDBUF = FN 60120 DATA Line,7,1,5,2,5
      IT(954)           60130 DATA Col,7,10,5,2,7
50100 COMP = FN       60140 DATA Answer
      IT(956):LINE = FN type,7,20,5,2,4
      IT(958)          60150 DATA Max chars in
50110 CLINE = FN IT(960) answer,9,1,5,2,7
50120 REM              60160 DATA Max numeric
      Other DOSFILE    value,11,5,5,9,5
      interface addresses 61000 REM
50130 RECLN = 942:VOL = Miscellaneous
      943:DRIVE = 944:SLOT = messages
      945              61010 PRINT CLS$: PRINT
50140 FILTYPE = 946:RTCODE = "This feature has not yet
      949              been implemented"
50150 POKE RECLN,RL: RETURN 61020 PRINT : PRINT "
50160 REM              Press RETURN to continue
      Initialise      ";
      arrays and read 61030 FOR N = 0 TO 1: GET
      formgen        A$
      data            61040 N = (A$ = RT$): NEXT :
50170 DIM              PRINT : RETURN
      FD$(R),FDX(5,R),OUT$(R),CO 61050 PRINT : PRINT : HTAB
      MP(R)           0: PRINT "File not in
50180 FOR FF = 1 TO 7: READ this system.": GOSUB
      FD$(FF): REM Formgen data 61020: RETURN
50190 FOR N = 1 TO 5: READ 61060 PRINT : PRINT : IF
      FDX(N,FF): NEXT NOT R THEN PRINT "No ";
50200 FDX(0,FF) = FDX(5,FF): 61070 IF R THEN PRINT
      NEXT : RETURN   "Only ";R;" ";
50210 PRINT CHR$(4)"BRUN 61080 PRINT FR$;
      DOSFILE.OBJ0" 61090 IF R < > 1 THEN
50220 PRINT CHR$(4)"BLOAD PRINT "s";
      DOSFILE.OBJ1": RETURN 61100 PRINT " stored.":
60000 DATA Design new GOSUB 61020: RETURN
      form,Review existing file 61200 PRINT CLS$: HTAB 10:
60010 DATA Init data PRINT IV$ WARNING "NO$
      disc,Catalogue disc 61210 PRINT : PRINT "This
60020 DATA Exit programme alteration will destroy
60030 DATA Add new all"
      field,Insert new field 61220 PRINT : PRINT " the
60040 DATA View/Edit data in this file"
      field,Delete field 61230 PRINT : PRINT
60050 DATA Return to main "Continue? (Y/N) ";
      menu            GOSUB 271: RETURN
60060 DATA Add new
      record,Insert new record

```



Just a touch of Magic

THE Macintosh Graphics Input Controller – Magic – from Heyden has been upgraded to incorporate a number of new features intended for the user who wants to do more than simply digitise a picture, says the distributor.

The new version enables the user to take three distinct types of picture – standard black and white in positive or inverse format, patterned pictures and “edges only”, used mainly for drawing an outline or tracing effect of an image.

Magic also enables control over how the picture is handled. It allows black and white intensity thresholds to be set and a number of different grey scale patterns.

These grey scales in the final picture are the result of blending and combining the patterns available through MacPaint.

The graphics input controller also gives a 200 per cent print enhancement effect, says Heyden.

Magic's £695 price tag includes a high resolution black and white camera with 16mm lens, software and manual.

● Heyden & Son, Spectrum House, Hillview Gardens, London NW4 2JQ. Tel: 01-203 5171.

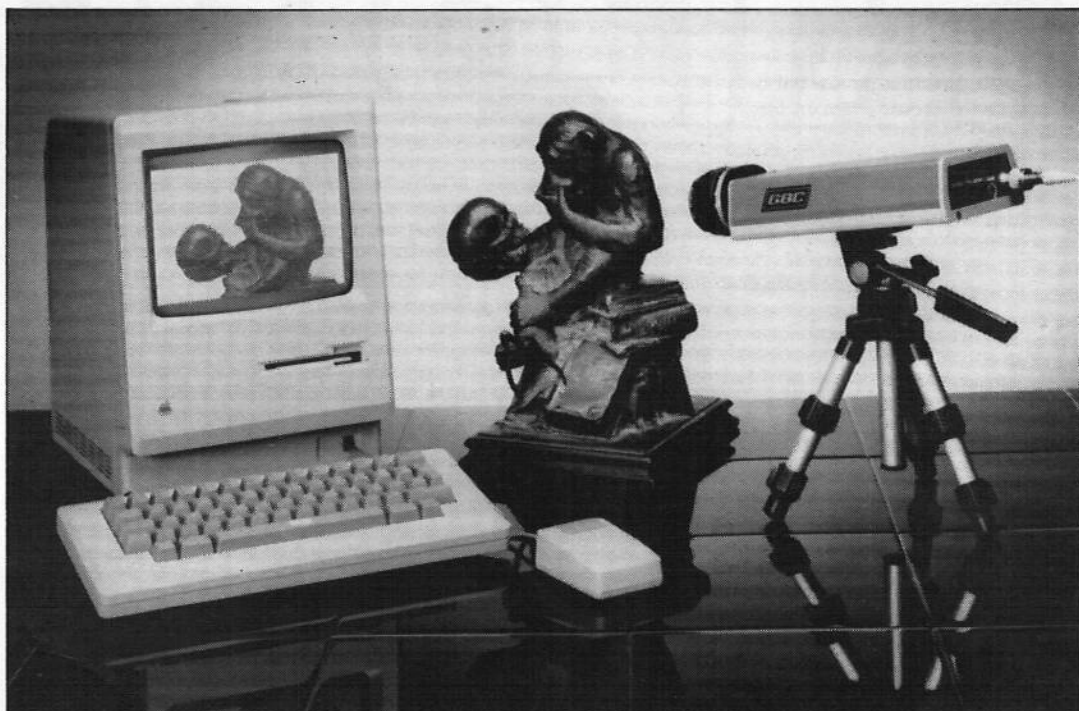
War all the way

STRATEGIC Simulations has gone to war on the games market with its three latest releases for the Apple II series – Battle of Antietam, Norway 1985 and USAAF.

The first, a tactical civil war game for one or two players centres on the 1862 battle at Antietam Creek, Sharpsburg, Pennsylvania.

It has three ability levels, introductory, intermediate and advanced. Price \$49.95.

The Soviet occupation of Norway and Nato's counter-



Macintosh Graphics Input Controller

attack is the subject of Norway 1985, the fourth game in SSI's When Superpowers Collide series.

Written by Roger Keating, it is an advanced level game for one or two players, price \$34.95. In addition to the normal complement of fighting units, mortar infantry ski troops are used.

United States Army Air Force is a very detailed strategic simulation of daylight bombing of German industry from 1943-5.

Twenty four aircraft types are involved – 20 fighters and four bombers. It is also for one or two players. Price \$59.95.

● Strategic Simulations Inc, 883 Stierlin Road, Bldg A-200, Mountain View, CA 94043-1983. Tel: 415 964 1353.

Compatible drive

APPLE'S 800k UniDisk 3.5 drive has been given DOS 3.3 compatibility thanks to American firm MicroSparc.

The company's new UniDOS 3.3 operating system features two 400k volumes per disc, support of up to two UniDisk 3.5 drives, the ability to intermix 5.25in and 3.5in disc drives. It also allows 217 catalogue names per disc and uses 1k of user memory.

UniDOS 3.3 comes with a user manual and technical data sheet, price \$49.95. It runs on

the Apple II+, IIe and IIc.

● MicroSparc, 45 Winthrop Street, Concord, MA 01742. Tel: 617 371 1660.

Mac disc server

SYMBIOTIC has produced the first in a line of products it is to release for the Appletalk network for the Macintosh.

It is a disc server which frees the Macintosh for other work and its performance is equivalent to internal disc drives, claims the company.

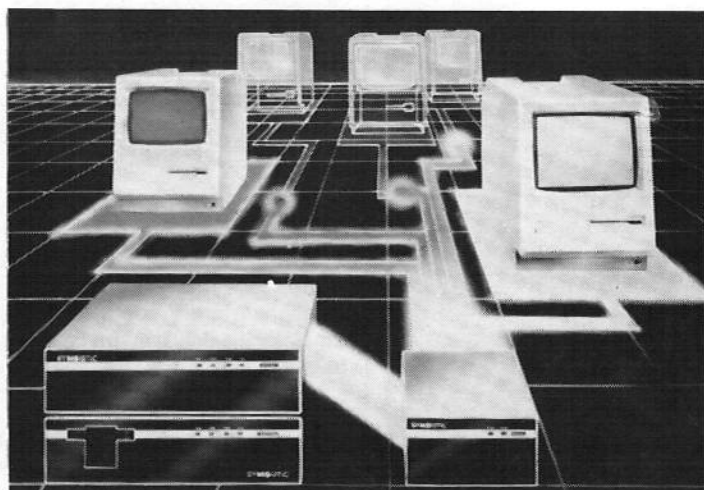
The 68000 based unit works with 512k Macintosh, Laserwriter, Imagewriter II and any other standard Appletalk-compatible hardware or software. Price £1,395.

● Symbiotic, Duroma House, 32 Elmwood Road, Croydon, Surrey CR9 2TX. Tel: 01-683 1137.

Multi dumper

MAKER D-Soft says its new program enables Apple II and III series screen dumps to be printed on any type of printer, including daisywheels.

The program, called Apple Dumpings, will dump any high



Appletalk disc server from Symbiotic

resolution graphics or partial or complete text screen in a variety of modes, including side print. Price - £19.95.

● *D-Soft Micro Computer Software, 60 Chancellors Road, London W6 9RS. Tel: 01-749 9202.*

One-handed keyboard

REALISING that not everyone can get to grips with a conventional keyboard, MBA Software has produced an emulation and keyboard replacement for the Apple II and IIe.

The Octima Chord Keyboard is a compact device for one-handed operation with only eight keys which are used in mnemonic combinations.

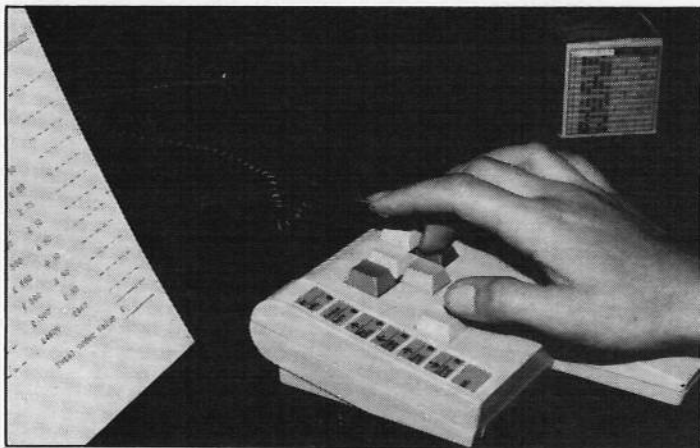
It was developed in Israel, originally to enable a judge to take notes in court where he thought a conventional keyboard would be too distracting.

MBA says an added advantage of the model is that anyone using it has one hand free to use the phone or hold papers.

The Octima also has an auxiliary control panel and a pull-out auxiliary membrane keyboard to give a wide choice of editing and command keys. The user can switch back and forth between them and the main control keys.

A disc tutorial is provided with the keyboard, which costs £345.

● *MBA Software, Millbank House, Catherine Wheel Road, Brentford, TW8 8BW. Tel: 01-847 1686.*



Octima - the one-hand compact complete keyboard



Ronald Young, Systematics, and Antony Lane, Time Manager International with MacTime

Time for planning

A TIME management course used by 300,000 people in 25 countries has now been put into software for use on the Macintosh.

Distributor Systematics International says it is the first time such a system has been converted for computer use.

MacTime, from Time Manager International, covers issues such as personal, work and life planning, communications and time management.

Systematics claims it will help in integrating long term goals with short term demands, setting priorities, taking control of work time, identifying areas that achieve results, improving

communications skills, personal growth and development and reducing stress and tiredness.

The program uses a full complement of pull down menus and facilities including cut and paste, scrapbook and switching.

It comes with user manual, illustrated personal development workbook and daytime management diary. The price of the system ranges from £150 to £250 depending on the degree of training and support given by the dealer.

● *Systematics International, Group HQ, Cleves House, Hamlet Road, Haverhill, Suffolk CB9 8EE. Tel: 0440 61121.*

Data control in industry

A MULTI-function interface card has been released for the Apple II which provides data acquisition and control facilities for industrial and laboratory applications.

The XAD5 from XCalibur provides 32 channels of integrating 12 bit analogue to digital conversion, 24 channels of digital input/output, a real time clock calendar with battery back up and autoscan.

A demonstration disc and manual are supplied with each card. Price £399.

● *XCalibur Computers, Spencer House, 3 Spencer Parade, Northampton NN1 5AB. Tel: 0604 21051.*

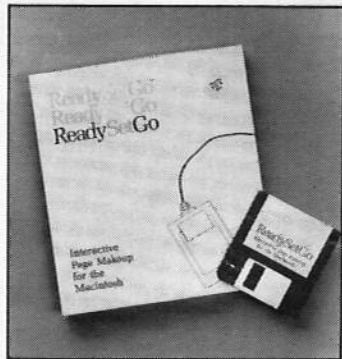
Set for an upgrade

THE page processing software for the Macintosh from Heyden, ReadySetGo, has been upgraded.

The program - which helps in the design of layouts for such diverse projects as newsletters, flyers, brochures, magazines, reports and catalogues - now has five new features.

They are multi-page capability, text flow incorporating both article and page scrolling facilities, advanced picture features, direct access to text files and display page functions.

The text flow feature allows blocks to be linked together, enabling text to flow automatically between columns on



Heyden's ReadySetGo

the same page or on pages throughout the document.

Direct access to files allows users to fill their pages directly with large volumes of text brought in from other Mac programs, rather than having to type in copy from scratch.

With its full text editing features, it lets the user change typeface and size and style of copy including justification, tabbing and indenting.

The display page function allows the user to see whole single or double page layouts at a glance.

RSG can output complete documents on Apple's ImageWriter or Laserwriter printers. It costs £125.

A version for commercial typesetting equipment will soon be available, says Heyden.

● *Heyden & Son, Spectrum House, Hillview Gardens, London NW4 2JQ. Tel: 01-203 5173.*

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The biggest bulletin board of them all

The number of bulletin boards is growing rapidly. New ones are springing up in all parts of Britain and all over the world, with people of like minds chatting to each other on all manner of subjects. 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.

We're only a local phone call away

More than 96 per cent 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 access to the international Dialcom system through MicroLink.

Telemessages - at a third of the cost

The modern equivalent of the telegram is the telemessage, which if sent before 8pm is delivered by first post the following day (except Sunday). Originally designed for people to phone their message via the operator, the service costs £3.50 for 50 words. Now it's available via MicroLink - and costs only £1.25 for up to 350 words!

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. You can key in a telex during the day and instruct MicroLink not to transmit it until after 8pm - and save 10 per cent off the cost!

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.

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 10.5p a minute during office hours. There is an additional 2p a minute PSS charge if you are calling from outside the 01-London call area. Charges for telex, tele-messages 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; 10.5p 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 a telex, short codes and mail files. The number of units used is an average calculated by reference to a daily sample.

Information Databases: Various charges.

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

MicroLink PSS service: 2p per minute or part (300 baud); 2.5p per minute or part (1200/75 baud).

Only applies to users outside the 01-London call area.

Telex registration: £10.

Outgoing telex: 5.5p per 100 characters (UK); 11p per 100 (Europe); 16.5p per 100 (N. America); £1.15 per 400 (Rest of world); £2.75 per 400 (Ships at sea).

Deferred messages sent on the night service are subject to a 10 per cent discount.

Incoming telex: 50p for each correctly addressed telex delivered to your mailbox. Obtaining a mailbox reference from the sender incurs a further charge of 50p.

It is not possible to deliver a telex without a mailbox reference. If a telex is received without a mailbox reference the sender will be advised of non-delivery and asked to provide a mailbox address.

Each user validated for telex and using the facility will incur a charge of 6 storage units a month. Further storage charges could be incurred depending on the amount of telex storage and the use made of short code and message file facilities.

Telemessages: £1.25 for up to 350 words.

Radiopaging: No charge.

If you have a BT Radiopager you can be paged automatically whenever a message is waiting in your mailbox.

International Mail: For the first 2,048 characters - 20p to Germany and Denmark; 30p to USA, Australia, Canada, Singapore, Hong Kong and Israel. For additional 1,024 characters - 10p; 15p.

These charges relate to the transmission of information by the Dialcom service to other Dialcom services outside the UK and the Isle of Man. Multiple copies to addresses on the same system host incur only one transmission charge.

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

Software over the telephone

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

Talk to the world - by satellite

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

What you need to access MicroLink

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

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

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Date _____

I intend to use the following computer _____

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Mailbox assigned _____

Start date _____

Password _____

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Database Publications
Europa House
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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

19

Allow 10 days for validation of mailbox

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.

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To

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Name of Account to be debited

Account Number

B. Please debit my/our Access/Visa/*American Express account number

* Overseas subscribers only

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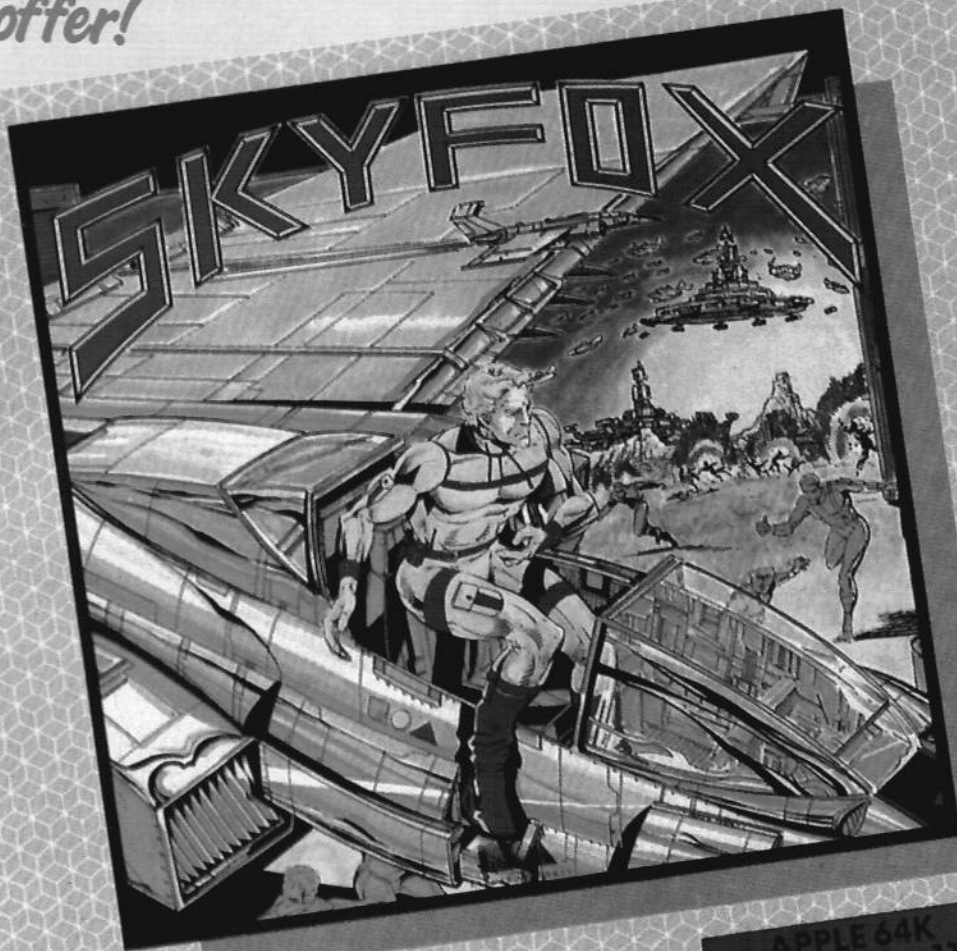
Signature _____ Date _____

C. Please invoice the company/authority.

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

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We've now obtained copies of the Skyfox package for our readers at the exceptionally low price of £15.95. Don't miss this chance to get your hands on a program that will tax your Apple to its very limit!

Order form on Page 61

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LPA micro-PROLOG, the famous implementation of PROLOG for the micro-computer, is now available for Apple IIe and IIc computers. Included with the software is an easy-to-use wire bound reference manual and a FREE introductory book entitled "Start Problem Solving with PROLOG" written by Tom Conlon and published by Addison-Wesley.



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THE Apple, as well as having two hi-res screens, also has two text screens. The second one though is not normally accessible as Basic programs start at the beginning of this area and there are no routines that would let you to it anyway.

The program presented here is a utility for moving the start of Applesoft programs above the second screen and allows you to print to it. There are some ampersand commands that mimic the actions of Basic commands like &HOME to clear the screen.

The heart of the program is the line base address finding routine which uses the two lookup tables which hold the low bytes and the high bytes of the addresses.

The equivalent monitor routine calculates these addresses and occupies less memory, but using lookup tables is faster. In this case there was a choice of whether to use a lookup table, sometimes there is not, such as in the AMP routine. The lookup table holds the addresses of the routines which are, in this case, uncalculable.

BASCALC is further speeded up by splitting the lookup table into two, the high byte and the low byte of the screen addresses. This means that there is no need to double the index.

You can do some interesting tricks by altering POS and POS2. By typing them both in, in the reverse order, the screen is turned "upside down", the screen is cleared from the top to the bottom and the "bottom" line is now the top.

The routine can be adapted to work on the primary text screen by subtracting \$04 from

PRINTING TO THAT HIDDEN TEXT SCREEN

By MALCOLM WHAPSHOTT

the values in POS.

Commands accepted by the program are &HOME to clear the screen, HOME only moves the cursor to the top left corner without clearing the screen. &TEXT switches to the second screen and &NORMAL switches you back.

You should use these commands to keep the cursor and anything you write or print in view. It also supports &HTAB and &VTAB.

The command &PRINT will allow printing on the screen you can't see. Using it again returns things to normal, and &HGR2 allows mixed text and graphics on the second hi-res screen.

The program has to be initialised by typing &LOMEM: and should be run before any variables, including strings, are initialised.

If you wish you can have a different text window on each screen by poking the new values into the appropriate locations when you are displaying the corresponding screen. The text window and screen position is saved when you change screen using either &TEXT or &NORMAL.

Obvious uses for such a program are as a help screen or any other situation where you would like to leave the text screen intact but print some other information. Another use might be animation by flipping between screens.

There are certain limitations to this program. Some programs will not run because they expect to start at \$0801, or they are too big to run in the space remaining.

Less than (<) should be >

and vice-versa if you are not using the DOS toolkit. The label ZZZZ is for de-bugging only and should be deleted before running the program. Its value should be \$9600 for correct assembly.

Something to note if you are using a IIc or IIc is what look like lines of interference on the second text screen. This usually shows up in periods of heavy access to the screen area of memory, such as during scrolling.

I do not know the reason for this, but the problem also exists on the second hi-res screen under similar conditions.

When I approached Apple on this problem, they seemed unaware of it but if you do find this a problem then the only thing to do is to use the primary screen.

```

SOURCE  FILE: TUOC
0000:      1          LST  GEN
0000:      2 *****
0000:      3 *
0000:      4 * TEXT PAGE TWO *
0000:      5 *
0000:      6 * PRINTING ROUTINE *
0000:      7 *
0000:      8 * FOR APPLE USER BY *
0000:      9 *
0000:     10 * MALCOLM WHAPSHOTT *
0000:     11 *
0000:     12 * COPYRIGHT (C) 1985 *
0000:     13 *
0000:     14 *****
0000:     0000 15 LDC0 EQU $00
0000:     0001 16 LDC1 EQU $01
0000:     0002 17 XSAV EQU $02
0000:     0020 18 WNDLFT EQU $20
0000:     0021 19 WNDWTH EQU $21
0000:     0022 20 WNDTOP EQU $22
0000:     0023 21 WNDBTM EQU $23
0000:     0024 22 CH EQU $24
0000:     0025 23 CV EQU $25
0000:     0028 24 BASL EQU $28
0000:     0029 25 BASH EQU $29
0000:     002A 26 BAS2L EQU $2A
0000:     002B 27 BAS2H EQU $2B
0000:     0032 28 INVFLG EQU $32
0000:     0035 29 YSAV1 EQU $35
0000:     0050 30 LINNUM EQU $50 ;TEMP WORK SPACE
0000:     005E 31 INDEX EQU $5E
0000:     0067 32 TXTTAB EQU $67 ;START OF BASIC POINTER
0000:     0069 33 VARTAB EQU $69 ;START OF VARIABLES POINTER
    
```

```

0000: 006F 34 FRETOP EQU #6F :BOTTOM OF STRINGS 9306:20 74 95 111 JSR HOMER
0000: 0073 35 MEMSIZ EQU #73 :HIMEM 9309:20 A5 94 112 JSR SWAP1
0000: 0076 36 OLDLN EQU #76 930C:20 B1 00 113 JSR CHRGET :INCREMENT TXTPTR
0000: 0094 37 HIGHDS EQU #94 930F:4C 6C D6 114 JMP CLEARC
0000: 0096 38 HIGHTR EQU #96 9312: 115 *-----
0000: 00AF 39 PRGEND EQU #AF :END OF BASIC 9312:A5 67 116 INIT.PRG LDA TXTTAB
0000: 00B1 40 CHRGET EQU #B1 9314:85 96 117 STA HIGHTR
0000: 00B7 41 CHRGET EQU #B7 9316:A5 B0 118 LDA PRGEND+*01
0000: 00B8 42 TXTPTR EQU #B8 9318:85 97 119 STA HIGHTR+*01
0000: 00E6 43 HPAG EQU #E6 :HI-RES SCREEN 931A:C6 96 120 DEC HIGHTR
0000: 00FC 44 STAX EQU #FC 931C:38 121 SEC
0000: 03F5 45 AMPERV EQU #03F5 931D:A9 00 122 LDA #NEW.STRT
0000: 0C00 46 NEW.STRT EQU #0C00 :NEW START OF BASIC 931F:85 94 123 STA HIGHDS
0000: 0C50 47 TXTCLE EQU #0C50 9321:E5 67 124 SRC TXTTAB
0000: AA53 48 DOS.CSML EQU #AA53 9323:85 50 125 STA LINNUM
0000: 0C51 49 TXTSET EQU #0C51 9325:A9 0C 126 LDA #NEW.STRT
0000: 0C53 50 MIXSET EQU #0C53 9327:85 95 127 STA HIGHDS+*01
0000: 0C54 51 LOWSCR EQU #0C54 9329:E5 68 128 SRC TXTTAB+*01
0000: 0C55 52 HISCR EQU #0C55 932B:85 51 129 STA LINNUM+*01
0000: 0C57 53 HIRE EQU #0C57 932D:A5 AF 130 LDA PRGEND
0000: 03C3 54 MVBYT EQU #03C3 :MOVE MEMORY UP 932F:E5 67 131 SRC TXTTAB
0000: 0412 55 ERROR EQU #0412 :ERROR PRINTING ROUTINE 9331:A8 132 TAY
0000: 066C 56 CLEARC EQU #066C :RESET BASIC POINTERS 9332:A5 B0 133 LDA PRGEND+*01
0000: 0AFB 57 CRDO EQU #0AFB :PRINT A RETURN 9334:E5 68 134 SRC TXTTAB+*01
0000: E6F8 58 GETBYT EQU #E6F8 :GET A NUMBER 9336:AA 135 TAX
0000: F3F2 59 HCLR EQU #F3F2 :CLEAR HI-RES SCREEN 9337:18 136 CLC
0000: FBD9 60 BELL1 EQU #FBD9 9338:65 95 137 ADC HIGHDS+*01
0000: FC22 61 VTAB EQU #FC22 933A:85 95 138 STA HIGHDS+*01
0000: FD0C 62 RDKEY EQU #FD0C 933C:CB 139 INY
0000: FD1B 63 KEVIN EQU #FD1B 933D:D0 01 9340 140 BNE NO.INC
0000: 64 * BASIC TOKENS 933F:EB 141 INX
0000: 0089 65 TEXT.TOK EQU 137 :FROM APPLESOFT MANUAL 9340:EB 142 NO.INC
0000: 0090 66 HGR2.TOK EQU 144 9341:CB 143 INY
0000: 0096 67 HTAB.TOK EQU 150 9342:20 C3 D3 144 JSR MVBYT
0000: 0097 68 HOME.TOK EQU 151 9345:A2 69 145 LDX #VARTAB
0000: 009D 69 NORM.TOK EQU 157 9347:20 E0 92 146 JSR ADD.OFF
0000: 00A2 70 VTAB.TOK EQU 162 934A:A2 AF 147 LDX #PRGEND
0000: 00A4 71 LOMEM.TOK EQU 164 934C:20 E0 92 148 JSR ADD.OFF
0000: 00BA 72 PRNT.TOK EQU 186 934F:A2 67 149 LDX #TXTTAB
0000: 73 * 9351:20 E0 92 150 JSR ADD.OFF
----- NEXT OBJECT FILE NAME IS TUOC.OBJ0
92C4: 92C4 74 ORG #92C4 9354:A2 76 151 LDX #OLDLN
92C4: 75 * 9356:20 E0 92 152 JSR ADD.OFF
92C4:A9 4C 76 INIT LDA #*4C :SET UP AMPERSAND VECTOR 9359:A5 B9 153 LDA TXTPTR+*01
92C6:8D F5 03 77 STA AMPERV 935B:C9 02 154 CMP #*02
92C9:A9 85 78 LDA #AMP 935D:F0 05 9364 155 BEQ IS.DIR :PROGRAM NOT RUNNING
92CB:8D F6 03 79 STA AMPERV+*01 935F:A2 B8 156 LDX #TXTPTR
92CE:A9 93 80 LDA #AMP 9361:20 E0 92 157 JSR ADD.OFF
92D0:8D F7 03 81 STA AMPERV+*02 9364:A5 67 158 IS.DIR LDA TXTTAB
92D3:A9 C4 82 LDA #INIT 9366:A4 68 159 LDY TXTTAB+*01
92D5:85 73 83 STA MEMSIZ 9368:85 5E 160 STA INDEX
92D7:85 6F 84 STA FRETOP 936A:84 5F 161 STY INDEX+*01
92D9:A9 92 85 LDA #INIT 936C:A0 00 162 LNK.LN LDY #*00 :RE LINK LINES
92DB:85 74 86 STA MEMSIZ+*01 936E:38 163 SEC
92DD:85 70 87 STA FRETOP+*01 936F:B1 5E 164 LDA (INDEX),Y
92DF:60 88 RTS 9371:65 50 165 ADC LINNUM
92E0: 89 *----- 9373:91 5E 166 STA (INDEX),Y
92E0:38 90 ADD.OFF SEC :ADD OFFSET TO 9375:AA 167 TAX
92E1:85 00 91 LDA LOC0,X :POINTER POINTED TO 9376:CB 168 INY
92E3:65 50 92 ADC LINNUM :BY X 9377:B1 5E 169 LDA (INDEX),Y
92E5:95 60 93 STA LOC0,X 9379:F0 B8 9303 170 BEQ END_LNK
92E7:85 01 94 LDA LOC1,X 937B:65 51 171 ADC LINNUM+*01
92E9:65 51 95 ADC LINNUM+*01 937D:91 5E 172 STA (INDEX),Y
92EB:95 01 96 STA LOC1,X 937F:86 5E 173 STY INDEX
92ED:60 97 RTS 9381:85 5F 174 STA INDEX+*01
92EE: 98 *----- 9383:90 E7 936C 175 BCC LNK.LN
92EE:00 28 00 18 99 WIN.2.DOW DFB #00,#28,#0,#18 9385: 176 *-----
92F2:00 00 100 CURS.2.OR DFB #00,#00 9385:A0 07 177 AMP LDY #*07
92F4:F1 94 101 SW.2 DW TUOC 9387:D9 9D 93 178 NXT.TOK CMP TOK,Y
92F6:31 94 102 DW INKEY 938A:F0 08 9394 179 BEQ IS.TOK
92F8: 103 *----- 938C:88 180 DEY
92F8: 0004 104 WINDOW DS #04 938D:10 FB 9387 181 BPL NXT.TOK
92FC: 0002 105 CURSOR DS #02 938F:A2 10 182 TO.ERR LDX #*10 :SYNTAX ERROR
92FE: 0004 106 SW.1 DS #04 9391:4C 12 D4 183 JMP ERROR
9302: 107 *----- 9394: 184 *-----
9302:00 108 SCR.N.FLG DFB #00 9394:B9 AD 93 185 IS.TOK LDA TOKH,Y
9303: 109 *----- 9397:48 186 PHA
9303:20 5A 94 110 END.LNK JSR SWAP2 939B:B9 A5 93 187 LDA TOKL,Y
9303:20 5A 94 110 END.LNK JSR SWAP2 939B:48 188 PHA

```

939C:60	189	RTS	;JUMP TO ROUTINE;			
939D:	190	-----				
939D:A4 B9 97 9D	191	TOK DFB	LOMEN.TOK,TEXT.TOK,HOME.TOK,NORM.TOK			
93A1:96 A2 90 BA	192	DFB	HTAB.TOK,VTAB.TOK,HGR2.TOK,PRNT.TOK			
93A5:11	193	TOKL DFB	>INIT.PRG-#01 ;LSB OF ROUTINES			
93A6:B4	194	DFB	>TO.SCRN-#01			
93A7:C0	195	DFB	>TO.HOME-#01			
93A8:C6	196	DFB	>RESTORE-#01			
93A9:E6	197	DFB	>TO.HTAB-#01			
93AA:D2	198	DFB	>TO.VTAB-#01			
93AB:01	199	DFB	>TO.HGR2-#01			
93AC:1A	200	DFB	>TO.HIDE-#01			
93AD:93	201	TOKH DFB	<INIT.PRG-#01 ;MSB OF ROUTINES			
93AE:93	202	DFB	<TO.SCRN-#01			
93AF:93	203	DFB	<TO.HOME-#01			
93B0:93	204	DFB	<RESTORE-#01			
93B1:93	205	DFB	<TO.HTAB-#01			
93B2:93	206	DFB	<TO.VTAB-#01			
93B3:94	207	DFB	<TO.HGR2-#01			
93B4:94	208	DFB	<TO.HIDE-#01			
93B5:	209	-----				
93B5:8D 55 C0	210	TO.SCRN STA	HISCR ;TEXT			
93B8:8D 51 C0	211	STA	TXTSET			
93BB:20 5A 94	212	TO.2.SCRN JSR	SWAP2 ;PRINT ENTRY POINT			
93BE:4C B1 00	213	JMP	CHRGET			
93C1:	214	-----				
93C1:20 74 95	215	TO.HOME JSR	HOMER ;HOME			
93C4:4C B1 00	216	JMP	CHRGET			
93C7:	217	-----				
93C7:8D 54 C0	218	RESTORE STA	LOWSCR			
93CA:8D 51 C0	219	STA	TXTSET			
93CD:20 A5 94	220	RES.2.TORE JSR	SWAP1 ;PRINT ENTRY POINT			
93D0:4C B1 00	221	JMP	CHRGET			
93D3:	222	-----				
93D3:20 B1 00	223	TO.VTAB JSR	CHRGET			
93D6:20 FB E6	224	JSR	GETBYT			
93D9:CA	225	DEX				
93DA:8A	226	TXA				
93DB:C9 18	227	CMP	#18			
93DD:B0 B0 93BF	228	BCS	TO.ERR			
93DF:85 25	229	STA	CV			
93E1:20 40 95	230	JSR	TABVZ			
93E4:4C B7 00	231	JMP	CHRGET			
93E7:	232	-----				
93E7:20 B1 00	233	TO.HTAB JSR	CHRGET			
93EA:20 FB E6	234	JSR	GETBYT			
93ED:CA	235	DEX				
93EE:8A	236	TXA				
93EF:C9 28	237	HTAB1 CMP	#128			
93F1:90 0A 93FD	238	BCC	HTAB2			
93F3:E9 28	239	SBC	#128			
93F5:48	240	PHA				
93F6:20 FB DA	241	JSR	CRDO			
93F9:68	242	PLA				
93FA:4C EF 93	243	JMP	HTAB1			
93FD:	244	-----				
93FD:85 24	245	HTAB2 STA	CH			
93FF:4C B7 00	246	JMP	CHRGET			
9402:	247	-----				
9402:20 5A 94	248	TO.HGR2 JSR	SWAP2			
9405:8D 53 C0	249	STA	MIXSET			
9408:8D 55 C0	250	STA	HISCR			
940B:A9 40	251	LDA	#140 ;SET UP SCREEN CLEAR			
940D:85 E6	252	STA	HPAG ;ROUTINE			
940F:8D 57 C0	253	STA	HIRES			
9412:8D 50 C0	254	STA	TXTCLR			
9415:20 F2 F3	255	JSR	HCLR			
9418:4C B1 00	256	JMP	CHRGET			
941B:	257	-----				
941B:2C 02 93	258	TO.HIDE BIT	SCRN.FLG ;PRINT			
941E:30 AD 93CD	259	BMI	RES.2.TORE			
9420:10 99 93BB	260	BPL	TO.2.SCRN			
9422:	261	-----				
9422:68	262	ESC	PLA			
9423:68	263	PLA				
9424:86 02	264	STX	XSAV			
9426:20 0C FD	265	JSR	RDKEY			
9429:20 47 94	266	JSR	ESCNEW			
942C:A6 02	267	LDX	XSAV			
942E:4C 0C FD	268	JMP	RDKEY			
9431:	269	-----				
9431:20 1B FD	270	INKEY JSR	KEYIN			
9434:C9 9B	271	CMP	#19B ;WAS ESCAPE PRESSED?			
9436:F0 EA 9422	272	BEQ	ESC			
9438:60	273	NO.SWAP RTS				
9439:	274	-----				
9439:38	275	ESCOLD SEC				
943A:4C 48 95	276	JMP	ESC1			
943D:	277	-----				
943D:A8	278	ESCNEW TAY				
943E:B9 8C 93	279	LDA	XLTL-#C9.Y			
9441:20 39 94	280	JSR	ESCOLD			
9444:20 0C FD	281	JSR	RDKEY			
9447:C9 CE	282	ESCNEW CMP	#1N			
9449:80 EE 9439	283	BCS	ESCOLD			
944B:C9 C9	284	CMP	#1I			
944D:90 EA 9439	285	BCC	ESCOLD			
944F:C9 CC	286	CMP	#1L			
9451:F0 E6 9439	287	BEQ	ESCOLD			
9453:D0 E8 943D	288	BNE	ESCNEW			
9455:	289	-----				
9455:C4 C2 C1 FF	290	XLTL DFB	#C4,#C2,#C1,#FF,#C3 ;CONVERTS ABCD TO IJKM			
9459:C3	291	-----				
945A:	292	-----				
945A:	292	-----				
945A:	293	-----				
945A:2C 02 93	294	SWAP2 BIT	SCRN.FLG ;SWAP SCREEN 1			
945D:30 D9 9438	295	BMI	NO.SWAP ;PRINTERS ETC.			
945F:A0 03	296	LDY	#03 ;FOR SCREEN 2'S			
9461:B9 20 00	297	WIND LDA	WINDLFT.Y			
9464:99 FB 92	298	STA	WINDOW.Y			
9467:88	299	DEY				
9468:10 F7 9461	300	BPL	WIND			
946A:A5 24	301	LDA	CH			
946C:8D FC 92	302	STA	CURSOR			
946F:A5 25	303	LDA	CV			
9471:8D FD 92	304	STA	CURSOR+#1			
9474:A0 03	305	LDY	#03			
9476:89 53 AA	306	STA.SW LDA	DOS.CSWL.Y			
9479:99 FE 92	307	STA	SW.1.Y			
947C:88	308	DEY				
947D:10 F7 9476	309	BPL	STA.SW			
947F:A0 03	310	LDY	#03			
9481:89 EE 92	311	WIND2 LDA	WIN.2.DOW.Y			
9484:99 20 00	312	STA	WINDLFT.Y			
9487:88	313	DEY				
9488:10 F7 9461	314	BPL	WIND2			
948A:AD F2 92	315	LDA	CURS.2.OR			
948D:85 24	316	STA	CH			
948F:AD F3 92	317	LDA	CURS.2.OR+#01			
9492:85 25	318	STA	CV			
9494:A0 03	319	LDY	#03			
9496:89 F4 92	320	LDA.SW LDA	SW.2.Y			
9499:99 53 AA	321	STA	DOS.CSWL.Y			
949C:88	322	DEY				
949D:10 F7 9496	323	BPL	LDA.SW			
949F:8C 02 93	324	STY	SCRN.FLG			
94A2:4C 3E 95	325	JMP	TABV			
94A5:	326	-----				
94A5:2C 02 93	327	SWAP1 BIT	SCRN.FLG			
94A8:10 BE 9438	328	BPL	NO.SWAP			
94AA:A0 03	329	LDY	#03			
94AC:B9 20 00	330	DNIV LDA	WINDLFT.Y			
94AF:99 EE 92	331	STA	WIN.2.DOW.Y			
94B2:88	332	DEY				
94B3:10 F7 94AC	333	BPL	DNIV			
94B5:A5 24	334	LDA	CH			
94B7:8D F2 92	335	STA	CURS.2.OR			
94BA:A5 25	336	LDA	CV			
94BC:8D F3 92	337	STA	CURS.2.OR+#1			
94BF:A0 03	338	LDY	#03			
94C1:B9 53 AA	339	STA.2.SW LDA	DOS.CSWL.Y			
94C4:99 F4 92	340	STA	SW.2.Y			
94C7:88	341	DEY				
94CB:10 F7 94C1	342	BPL	STA.2.SW			
94CA:A0 03	343	LDY	#03			

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APPLE II+ 48k new mother board, disc drive, colour card, Software books £400. Tel: 0384 298381.

WANTED software and hardware for Apple II+. Tel: York 51186.

APPLE III software wanted especially Pascal III, Pascal utilities library, script III, including manuals! Also Apple softcard III system (CP/M). Also SOS manual. Also Apple Imagewriter DMP. Fair price paid. Tel: John 0249 74312.

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AMERICA'S Cup for Apple II. A yacht racing game of skill for two players. Includes 3 extra courses, sail changes,

racing rules. £20. Alan Broadbent, 24, Wakehams Hill, Pinner, Middlesex.

TWO Apple disc drives £100 each. Disc controller £20. Extended 80 col card £40. Monitor III £75. Blackboard parallel printer card £65. Snapshot with all programs £100. Apple Mouse £75. Prism Modem 1000 with extra program £65. Original software. P.F.S. File £45. Apple Mechanic £12. Bag of Tricks £20. Hilderbay Book-keeper £40. The Typewriter £20. Tel: 0787 61378.

SOFTWARE PFS Write and Report £40, Applewriter II £10, Visicalc £10, Super Printmaster parallel card £15. Tel: 0533 694619.

APPLE IIc monitor, Appleworks, Imagewriter, Accessory kit, 10 floppies £700. Tel: 0933 225858 working hours.

WANTED Apple IIe plus drives. Quick cash purchase anticipated. Tel: 0249 720932.

APPLE II+ twin drives, Z80, CP/M, keypad, 80 col 64k parallel colour cards,

Incredible Jack, TLO generator £425. Flight simulator £20, HX-20 Epson, Intext wordprocessor £180. Tel: 0285 861060 evenings (Private).

APPLE II+ Cirtec parallel printer card £25, 80 col card £20, 16k language card £20, Graphic mouse with software £25, 9" green monitor £25, Turbo Pascal £30, Turbo Toolbox £25 (All manuals) Tel: 0204 41459.

APPLE Dot Matrix printer plus interface £200. Accelerator card (II+) £100. Versawriter plus software £100. Colour card £15. All boxed as new. Tel: 051-678 4279.

PRINTERS NEC8023 £150, Daisystep 2000 with tractor £150. Both excellent condition. Tel: 0400 61695.

APPLE II, various boards, printer driver

cards, disc drives and professional software, plus daisywheel and matrix printers. Owner changing to PC. Tel: 0242 527504 evenings.

APPLE II+ 48k, twin 5.25" drives, 12" amber monitor, Z80 card, language card, 80 col card, P/printer card, serial card, 128k RAM card, numeric keypad, 40/80 col switch, Applewriter II, other software, total £600. Megastore 8" IBM twin drives £400. Centronics 739 printer £150. Tel: 0903 774626. Office 0903 205457 evenings.

WANTED S/H Apple IIe, disc drive, compatible monitor, Epson FX80 printer (or equivalent). Tel: (0825) 61277 (daytime).

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I WAS interested to read Mr Gordon Poss's letter in December's Apple User, regarding obtaining graphical output from Appleworks data.

I too use an Apple IIc with an Imagewriter and Appleworks. It is a joy to use compared to the Wordstar/Multiplan/DMS combination which I have in the office.

However I do have the advantage of being able to access remote database services such as Dialog in a professional capacity, and there is a very useful software database in that service (and others).

This has enabled me to find a graphics package designed for Appleworks. It is called Graphworks, published by PBI Software, and it uses the data from spreadsheet files to plot bar, stacked bar, line and pie charts. The cost in the States is \$79.95.

However since I already have a package called Graphics Department, from Sensible Software, another program would be an extravagance which I cannot indulge in.

Unfortunately although Graphics Department is now, I understand, available in a ProDOS version, mine is DOS 3.3.

This means that while I can print graphic output from the package I have to work in DOS 3.3, copy the saved graphics to a ProDOS disc, and then print via the Imagewriter Tool Kit.

DIF files can be read by Graphics Department, but the DOS transfer is still necessary.

Like PFS graph, which I have not seen, Graphics Department

Graphics package for Appleworks

has a very wide capability. It produces a wide range of graphical outputs, with or without statistical data, and has a lettering kit with a range of fonts, and a slide presentation module.

I have ordered the set of Peter Gorry's programs in the hope that I will be able to use them to produce hard copy in a rather more convenient manner than the above. — **Harvey Nyman, Harrow.**

● Graphworks is available in this country from MGA Microsystems at a cost of £79.95.

Tips on TAB

WE have two Apple IIs, with disc drives, monitors and printers at our school, although one is not available for student use, as it is used in the office for administration purposes.

A recent ban on playing games — on pain of having the disc INITIALISED — has meant that the few programmers in the school, including myself, have been able to really put the machine to good use.

Unfortunately, as my programs are getting more complex, I have discovered a gap in my knowledge that none of the available literature seems to be

able to fill.

If the IIe manuals say anything it is no good because they seem to have gone missing before I had chance to read them.

The problem is this. Commercial programs like Wordstar, Bank Street Writer and so on use the TAB, DELETE, and both the function keys in their operation, and in some programs Ctrl/Reset will return to a main menu, or other such thing, instead of halting program execution.

Therefore my question is how can I detect and utilise these keys from Basic, and if this is not possible, machine language?

Can you help? — **Scott Mitchell, New Plymouth, New Zealand.**

● TAB and DELETE are keys like any other. They return the Ascii codes 9 and 127 (decimal) respectively and so can be detected by GET.

For example, to use DELETE, GET each character and if it is found then backspace [PRINT CHR\$(8)], print a blank, and backspace again.

The function keys, OPEN and CLOSE APPLE, are not keys as such but are connected directly to the games port, where they function as the paddle buttons.

Hence to detect them look for PEEK(-16287) and PEEK(-16286). If the keys (or buttons) are pressed the value returned will be greater than 127 (or if you prefer bit 7 is set).

The ways of altering the effect of pressing RESET are too lengthy to discuss here but past numbers of *Windfall* and *Apple User* — August 1983, page 24; March 1983, page 23; September 1983, page 83; March 1984 page 50 all cover the topic. **Max Parrott**

Patch needed

AS a serious business user I was very pleased to read Mr Tong's

informative article on Wordstar in the August edition.

As Wordstar is always in drive A: and the data in drive B: I always have to change the logged disc drive when Wordstar is first loaded.

Could you or Mr Tong let me know if there is a way to modify the program so that as soon as Wordstar is loaded the logged disc drive is automatically B?

The Wordstar release I use is 3.00 and if the modification is by patching please let me know the step-by-step procedure from the moment I type INSTALL. — **M. Lemer, Hendon.**

● Searching through the Install and Customisation notes has not brought to light any simple patches. Why not leave the logged drive as A:, enter the file name as B:file and on subsequent file name requests use Ctrl-R? **Max Parrott**

Mac users

COULD you tell me if there is a Macintosh Users' Club, either locally or nationally, and if so how I can contact it? — **M.P. O'Connell, West Harrow, Middlesex.**

● We don't know of any Mac user groups, although there are plenty of Apple user groups. Your nearest one is probably the Croydon group, so phone Paul Vernon on 01-777 5478 to see if the group has a Mac section.

Castle capers

IT is a great pleasure, as (almost) always, to read a magazine like *Apple User*, of which I have read the September 1985 issue at least six times over. However there is a problem with which I feel your help would be invaluable.

It concerns Beyond Castle Wolfenstein by Muse Software. When I play it on a 64k II+, IIe or IIc, the castle layout can only be updated using the Esc key. While on a 48k II+ once a game is saved it is updated every time you go from a room to room, so if for some reason you interrupt it with Ctrl-Reset because of hostile guards, for instance, you can go PR#6, choose item D in the main start-up menu

Pascal pointers

COULD you recommend a good readable book on Standard or UCSD Pascal — with worked examples if possible?

I have an Apple II+ with a language card and use the Pascal language operating system, along with the Apple Pascal software and documentation of course. — **J.J. Pointer, Gillingham.**

● Two books I always fall back on are Practical Pascal for Microcomputers, by R. Graham, Sigma Technical Press, ISBN

0905104-17-X and An Introduction to Programming & Problem Solving with Pascal by G.M. Schneider, S.W. Weingart & D.M. Perlman, John Wiley & Sons, ISBN 0-471-08216-3 although I'm sure that there are many more good books available.

You might also like to contact USUS (UK), the UCSD p-System Users' Society. Their address is PO Box 448, Chelmsford, Essex CM2 8QB.

Max Parrott

Toolkit patch

("resume game in progress"), see the message "RESUMING WHERE YOU LEFT OFF...", and resume to a point just before the interruption.

I would very much appreciate it if you would tell me about either a software patch or a readily reversible hardware mod to the IIe to make the software behave as though the Language Card area RAM were absent (a soft patch is preferable).

If not, I will look forward to a knowledgeable reader's solution. I feel that this would be a good service to anyone playing Beyond Castle Wolfenstein on an Apple with 64k or more. — **Seiju C. Teramoto, GL 's-Gravenhage, The Netherlands.**

● Like Seiju, we look forward to a knowledgeable readers' solution.

Pascal tab

IN response to Christopher Harding's letter in the October 1985 Apple User I hope that the following suggestion will be of help.

Apple Pascal and also CP/M use Ctrl-I (Ascii 09) to represent a horizontal tab, and therefore cannot be used as the start of a deferred execution command.

When printing in a Pascal program the Ctrl-I is changed to Ctrl-Y (Ascii 25).

This works fine on my Apple using a Microline 82A printer and a Grappler card, but I don't know if it will work with other cards. — **Stephen P. Lowe, Shrewsbury.**

Plotter interface

I AM currently studying a GCE Technology course of which part includes a large project for which I am going to design and build a robot plotter.

This will be under control by my Apple II+.

I face the dilemma of having to buy a good interface which I can use to control my robot with. Please could someone tell me the best type of interface which costs under £70. — **Julian Leake, Rugby.**

● Before choosing an interface you have to decide whether the

I HAVE just found a problem with the cross-reference facility on the Toolkit disc. I have not seen reference to this in Apple User, so you may think it worthwhile to publish.

The cross-reference (&X) seems not to work on the two program lines following DATA. In this example if line 30 is omitted the reference to A and B in line 40 will be missed. Putting in a dummy line 30 solves the problem, but a REM at line 30 will not do.

If line 50 is also deleted, both lines 40 and 60 are missed, and there is, literally, no end.

```
10 A = 1
20 DATA 2,3,4,5
30 :
40 B = A + 6
50 :
60 END
```

— **Michael D. Bass, South Croydon.**

● We did publish a patch for this problem in *Windfall*, December 1982, Page 23. It is worth repeating here. Thanks once again to Neil Lomas.

Shaun Hope, writing in the April *Windfall*, described how the &XREF facility provided

robot plotter is going to accept analogue or digital data (or both) and whether digital data is going to be simple TTL or parallel or serial byte orientated data.

There is a wealth of relatively cheap interface cards for the Apple but remember that with suitable programming you could use the games port for many functions. A lot depends on the intelligence built into the robot.

Max Parrott

On the way out?

I FEEL that I must write to you giving my reasons for believing that the Apple computer is on the decline in this country.

Several weeks ago I purchased an Apple II Plus with Silent Type printer. The micro-processor was fitted with an

with the DOS Toolkit would cause the system to hang if the program contained a DATA statement, or block of DATA statements, not followed by a colon. This is because there is an incorrect assumption made after return from a subroutine.

To overcome the problem without having to add excess colons to your programs, add the following line to the LOADAPA program:

```
325 POKE 46989,32: POKE
46990,124: POKE 46991,145:
POKE 46992,201: POKE
46993,0: POKE 46994,96:
POKE 37229,141: POKE
37230,183
```

This patches the missing instruction back into the APA program, making use of an unused 6 byte area in the DOS (courtesy of Beneath Apple DOS).

Note that you should only make this change if you have DOS 3.3 and a 48k Apple. The area of DOS used for the patch does not conflict with the areas used by M.F. Sheppard's free disc space routine published in May, but you should check that you do not have any other customising routine in that area. — **Neil Lomas.**

integer board and a Microsoft colour board.

Imagine my dismay when I arrived home and plugged in the Apple to find that the DO ROM was u/s and that on inspection the cards fitted were an integer card less three ROM chips, a supposedly Silent Type printer card which was found to be an Apple ROM Card minus ROM chips.

The Microsoft RGB colour card appeared to be in order, but without information or software.

However I had an Apple II Plus computer! All I had to do was to contact the suppliers of the ROMs, cards and software and we were away.

After many telephone calls I finally found one company, 3SL of Sandbach, Cheshire, that would help me. Along to Sandbach I went and I was given four star treatment, with coffee, while a DO ROM was

fitted to the motherboard and integer chips were fitted in the integer card.

Unfortunately no Silent Type printer card was available, and they did not have any information on the Microsoft colour card.

Have you ever tried to find out about a Silent Type printer card without buying a printer? Or Microsoft colour card instructions and software without buying a new colour card?

Don't! It costs a fortune in phone calls and a very frayed temper.

Particularly with reference to the colour card. Having finally found the manufacturer or supplier, Microsoft of Windsor, I was told that the card was not produced any more and that they had no information on it whatsoever.

Who but an Apple accessory manufacturer would throw away all information on an item costing £100 or more manufactured only a few years ago?

Or was it a sales gimmick for a new colour card?

If information about the Apple, and peripherals is not available when countless magazines publish details of other manufacturers' machines and peripherals, then for one I am not going to purchase new cards and peripherals.

I am going to sell the Apple and let someone else have the difficulty of finding information about it and its cards. I will then purchase a machine that has all the information about itself and its peripherals readily available. — **C.P. Lilley, Milton, Stoke-on-Trent.**

● The system you bought was obviously second hand and not complete. This should be a warning — check thoroughly before you buy and ask for the manuals.

Before you sell the machine, see if any of our readers write in with details of Silent Type and Microsoft colour cards.

Have you checked to see if another parallel card will drive the printer, and if paper is still available for it?

It seems a little unfair to blame Apple for other manufacturers' shortcomings and your own failure to check second-hand equipment before buying it.



July 1984

Capitol CAD package - Automating CP/M with Pseudo disc drive - Wordstar on Epson printer - Relational Databases - Games (Lode Runner, Coveted Mirror, Crypt of Medea, Queen of Hearts, Quiz Listing) - Screensplicer - Ite super-res graphics - Pascal tutorial part VII (defining procedures) - Volume control for Apple II - Appleworks review - Lisa helping visually handicapped - Calculating mortgage repayments with Visicalc - PLUS News (including report on Apple '84), New Products and Letters.

August 1984

Communications - Apple in a haulage company - Book Review (Apple Basic Data File Programming) - Reviews (Scribe 3D CAD package, Sage CP/M Database, Codewriter IIe, Ramdrive IIe, ShortCuts) - Games (Plasmania, Bouncing Kamungas, Pinball Construction Set) - Graphics package part VI (text handling by machine code) - Lisa organising meetings - Pascal Assembler - Speech input via Voice Input Module - Multiplan helps with cricket scores PLUS News, New Products, Letters and Appletips.

September 1984

How an Apple helps police hero - Updating Apple graphics and arcade design - Serial data transfer - Games (Early Games Music, Learning with Leeper, Fuzzywomp, Hallowe'en) - and DIY Graphics Part VII (including review of Doublestuff) - Macintosh (journalist's view of MacWrite, Software Development, Transylvania, Linking Lisa to ICL mainframe) - Pascal Tutorial - Pilot Interpreter - Spreadsheet (including bug in VAV) - Reviews of Graphpak and Format-80 Enhanced - News, New Products and Letters.

October 1984

Appletips (drive-cleaning, DOS, REMs and Lists) - Apples in a clothing factory - Book reviews (games programming, Pilot, Apple IIc) - Games (Gruds in Space, Cherryspin, Aquatron) - Graphics Part VIII (including review of Spectrogram colour card) - Mac software reviews (MacForth, Click Art and Mac the Knife) - Simulation of radioactive decay and Einstein solids - Pascal tutorial - Flashcalc - Reviews of Blackboard printer card and CW/P drive - PLUS Letters, News and New Products.

November 1984

Apple in a primary school - Games (Flight Simulator II, Drol, BC's Quest for Tires) - Graphics Part IX (including review of Cat Graphics) - Pascal Tutorial: Introduction to Pascal Operating System - Macintosh languages: MacForth, MacBasic, MBasic and Instant Pascal - Two Macintosh books reviewed - Communications Part III: Software - Loading DOS Toolkit assembler onto language card - Software reviews (Digisolve's Pixel Paint, Hilderbay's Payroll) PLUS Letters, News and New Products.

December 1984

Games (Spare Change and Gumball) - Desert Island Discs with Pam Fisher - Pascal Tutorial (final look at the Operating System) - Spreadsheet (VisiCalc command table) - Lisa 7/7 Software - Macintosh games (Pensate and Frogger) - How Macintosh helps an actress - The world of the 6809 Pt. I: the Rehaflex board - Escher game listing - Graphics DIY Part X (including review of Sweet-P plotter) - Hilderbay SSP software review - Communications - PLUS News, New products and letters.

January 1985

John Sculley's View of 1985 - Games (Gelfing 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.

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February 1985

Steve Wozniak talks about Apple II developments - Quicksort algorithm in Forth and Basic - Games (Deadline, Witness, Planetfall, Enchanter, Scorcerer, Expedition Amazon) - Graphics DIY part XI - Targeting with a spreadsheet - Apple to Apple file transfer - Miners' strike resolved by computer? - Chemical formulae on Lisa - two Macintosh books reviewed - World of the 6809 Part III - Software reviews (Sales Edge and Management Edge) - Application: book publishing - Split screen techniques - PLUS News, New products and letters.

March 1985

Circle drawing algorithms - Super Pilot System Log - Summarising data with VisiCalc - Competitive estimating with Multiplan - Graphics DIY part XII - Ampersand editing - Macintosh (MacTerminal, Mouse Stampede, optical mouse, plus Mac book) - Reviews (Merl modem, Intec hard drive, Vision 128/256 card, the Editor, plus three educational packages) - Fun and Games (Xyphus, Fighter Command, Picture Writer) - PLUS News, New products, letters and Appletips.

April 1985

Apples in the dental surgery - Adding graphics commands to Applesoft - Using the VBLANK signal - Getting to grips with software - Reviews (Speed-Demon card, PFS File/Report for Macintosh, W-P-LAB) - Weather forecasting with Mac - Pascal File's D command - Fun and Games (La Triviata, Design Your Own Home: Architecture, Interiors, Landscape) - Books (Appletips, VisiCalc, Machine level programming) - Index to Windfall Vols. 1 and 2. PLUS News, New products, Letters and Appletips.

May 1985

Sports Day runs smoothly with Apples - Graphics DIY Part XIII (pie charts) - Reviews (The Workbench, Macputer IIc, Copytext, Omnis 2 on Macintosh, seven Logo books) - The RWTS explained and demonstrated with a disc verify routine - protecting programs from Copya - Pascal (directory access from within programs) - Binsearch in Forth and Basic - Reaction Timer - Apples in Hungary - Fun & Games (Smart Shopper, Plantin' Pal, Micro Cookbook) - PLUS News, New products 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+/Ile, 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 Printinterrupt) - Graphics DIY Part XIV - DOS patches - PLUS News, New Products, Letters and Appletips.

August 1985

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

September 1985

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

October 1985

&DOSFile: start of a new series - spreadsheet for home budgets - Apples in a Hertfordshire college - using Page 3 routines with a language card - Graphics DIY Part XVI - Reviews (Ramworks extended 80-column card, Computereyes and Magic digitisers) - add a 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 Kadesh, Cutthroats) - Sliding block puzzle in Metacraft's Forth - Apple User Games Disc offer - PLUS News, New Products and three pages of readers' letters.

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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.

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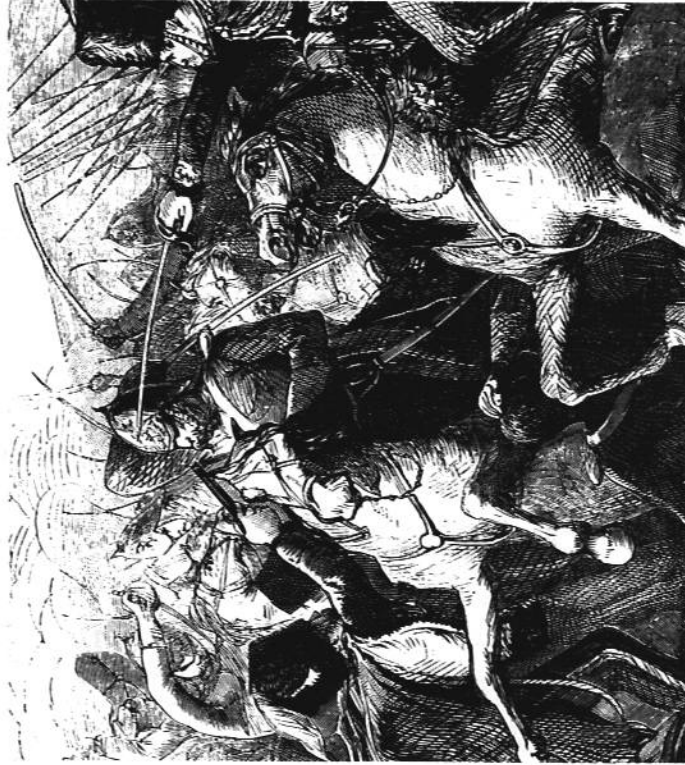
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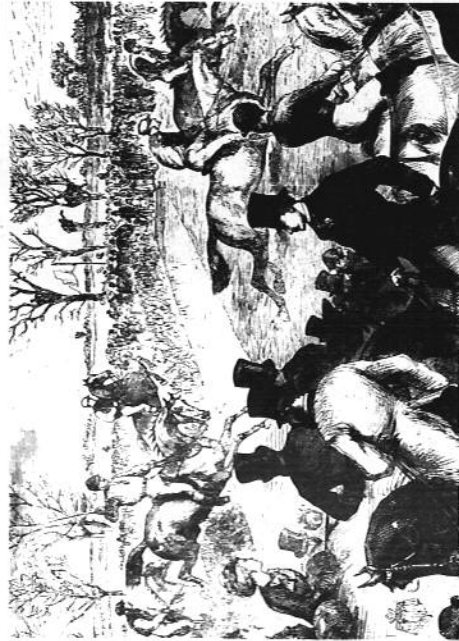
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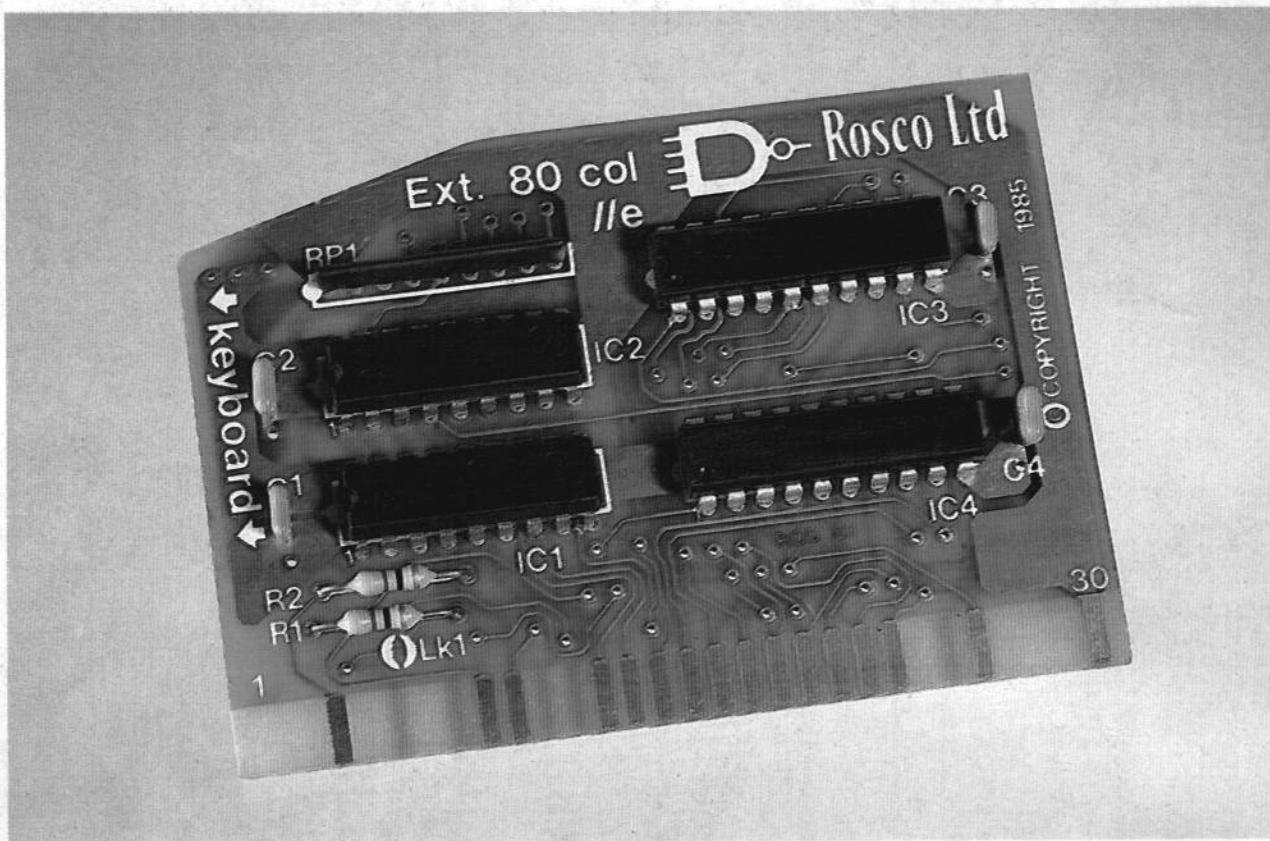


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