



A Database Publication

apple user

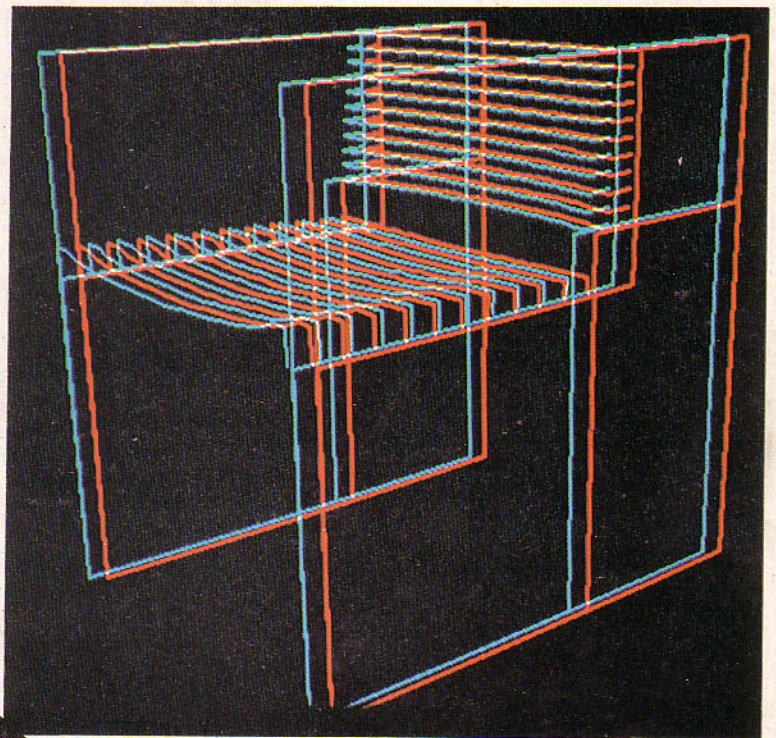
Vol. 4. No. 7. July 1984 £1

-the new name for
Windfall

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Capitol: a close look at a unique 3D CAD system
Double up on hi-res graphics
How to overcome super-res problems

Full report on



Appleworks, the 3-in-1 power pack, reviewed
Calculate your mortgage repayments
Rules for organising relational databases
How Lisa helps the visually handicapped
Our Pascal Tutorial tackles procedures
Full listing for DIY quiz program

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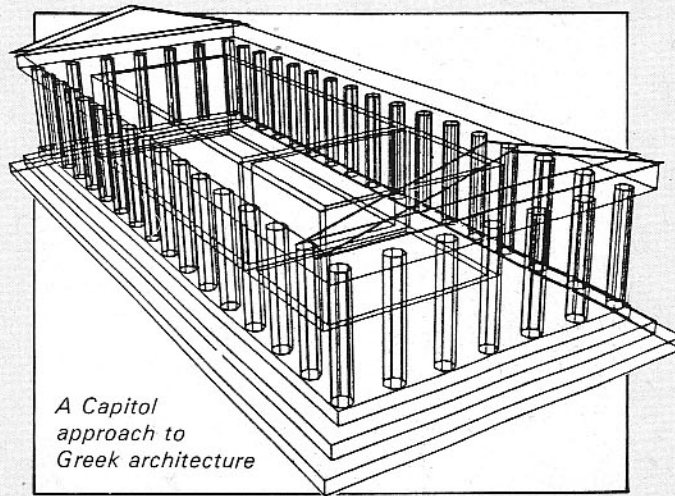
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£2m campaign for Macintosh

APPLE has launched a £2 million campaign to promote the Macintosh personal computer.

It involves television and newspaper advertising at both national and regional levels.

Main plank of the regional press support has been "Macintosh Week", with a machine given away each day in a competition organised through the company's 350 dealers.

Selected as the main theme

for national advertising is the suggestion that the Macintosh is to computing what the telephone was to morse code.

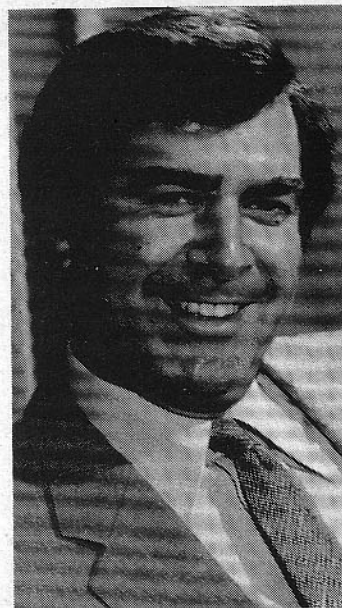
It is to hammer home the message that Macintosh users don't have to possess vast technical knowledge before being able to use a personal computer.

The campaign is the first major task to be undertaken for Apple in the UK by its new advertising agency, BDDO

International, and represents a major departure in approach.

"For the first time we are employing high-profile consumer marketing techniques", says Peter Cobb, managing director of Apple Computer (UK).

"Apple are utilising a message that accurately summarises what we feel Macintosh contributes to the use of computers for individuals in business".



Peter Cobb: "High profile consumer marketing techniques"

ICE hit jackpot - a cool million

INDEPENDENT Computer Engineering (ICE) hit the jackpot recently when the company received a cheque for £1 million to finance expansion.

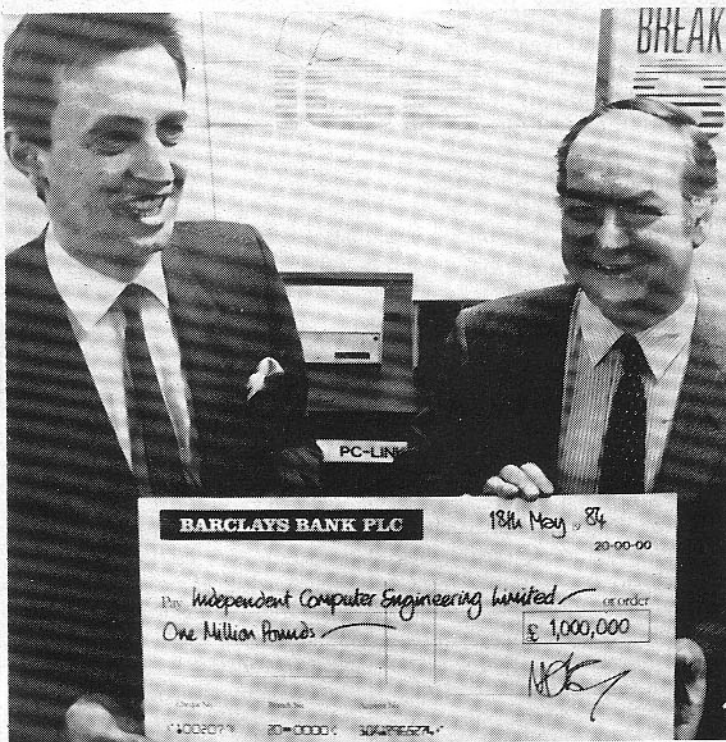
Based in Ashford, Middlesex, the firm has strong links with Apple as it manufactures a range of Apple compatible hard disc drives.

The company turned its back on offers from overseas investors in favour of a financial package raised in the UK by Henry Cooke, Lumsden & Co, Albert E. Sharp, Sumit, Dunbar and Co, and Electra Risk Capital.

"A dynamic company like ICE, with significant expansion prospects needs constant capital to grow", says chairman Brian Johnson. "We have raised that capital here".

ICE has an international distributor network selling to 19 countries and two distributors in the UK.

● Pictured receiving the £1 million cheque are Andrew Robson (left), managing director, and chairman Brian Johnson.



Mac gets Lotus 1-2-3

LOTUS is the latest major software company to develop a product for the Macintosh.

It demonstrated a Macintosh version of its integrated 1-2-3 program - a best seller on the IBM PC and other micros - at the Spring '84 Comdex show in the US, and says the product will be released this summer.

Lotus 1-2-3 combines spreadsheet analysis, graphing and information management.

The Macintosh version will take advantage of icons and the unique cut and paste utility which allows data interchange among programs.

"We are making a major corporate commitment to Macintosh", said Mitch Kapor of Lotus.

"Macintosh sets a whole new standard and we want our products to take advantage of this".

Apple exec on TV

ONE of the presenters on the recent Thames TV Database series was Apple marketing executive Jane Ashton.

She appeared once before on the show last October, when it featured Lisa. Says Jane: "I was thrilled to be invited back".

On her first day in the glamorous world of TV, Jane was whisked aloft in a Cessna as part of a feature on the Flight Simulator package.

But she did not present any Apple products on the programme. Under an IBA ruling, company employees cannot "sell" their own products - so Macintosh and the Apple IIc were handled by co-presenters Tony Bastable and Mike Thorne.

Database also looked overseas - to Hong Kong - going underground with a hidden camera to highlight software piracy, and later to Japan.

In the spotlight were the MSX micro, and the Fifth Generation project, aimed at creating a thinking supercomputer.

Also featured were Tokyo stores where you can buy all the parts to build your own micro - over the counter.

Six figure takings at Apple '84

A SURVEY of standholders at Apple '84 has revealed that almost 90 per cent achieved record sales during the three day event.

To date, a provisional estimate of orders received at Slough amounts to several hundred thousand pounds.

Nor does that take into account the number of enquiries made during the show which will take firms many weeks to follow up.

"Once again, all our records have been broken" — that is how one standholder summed up Apple '84.

And the same feeling was echoed by most firms at this year's show.

In particular, they were impressed by the quality of the visitors, from hobbyists right up to big business Apple users.

Some exhibitors were present just to see old friends and to get sales leads and enquiries for their products.

Others did sellout business

from start to finish.

"We did a lot of work, and arrived back totally exhausted", said Brian Morris of A.M. Technology.

"Crowds were round our stand all the time, with people plonking down cash and cheques on the spot".

And he added: "We took many thousands of pounds in orders — amazing for a £60 product.

"We will definitely be back next year, and we're thinking of taking a bigger stand next time. We were extremely impressed".

Systematics International reported hundreds of sales leads. "We were kept busy all the time", said sales manager Chris Robinson. "We previewed some new packages and signed

up new dealers. There was lots of interest from Apple end users".

As usual, there were plenty of visitors who had just come to look, and to collect "freebies" — hats, brochures, carrier bags and advice.

But in the main, the crowds were out to do serious business, a point appreciated by exhibitor after exhibitor.

"It was delightful to see so many customers" said Richard Baer of C/WP Computers.

And David Bridson of Dark Star Systems agreed. "We were very pleased.

"We made plenty of sales and took lots of orders for the Snapshot Shuttle on the strength of our show demonstration. It was nice to make new contacts and meet new

Apple users".

New products are a draw at any show, and Keyzone was well in the picture with its Apple IIc colour converter prototype.

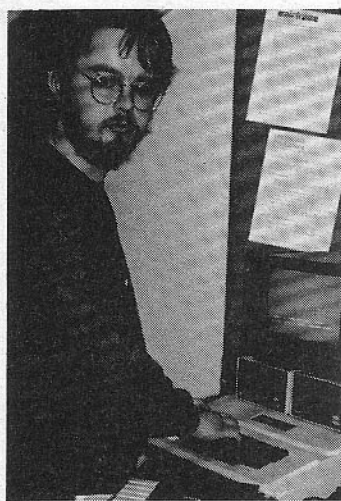
Visitor interest was also keen at Haigh and Hochland's book stall, where Apple fans bought twice as many books as they did during the record Apple '83 show.

And the thirst for information was just as strong at the *Apple User* technical stand. Our experts had their work cut out meeting the readers and answering the queries fired at them from all sides.

In the end, the feelings of many standholders were summed up by David Aird of the GCS engineering company.

He said: "We did even better than at Apple '83. We had 88 enquiries and identified many good prospects for our service — some of them national companies.

"We will definitely be coming next year".



John Molloy demonstrates the DS3 — with help from an Apple.

INTO TOMORROW

A SHORTAGE of staff to man the Greengate Productions stand on the first day of Apple '84 was explained away by saying they had stepped into Tomorrow's World — literally.

For key members of the team had been called away by the BBC to demonstrate a device which is standing the pop record world on its head live on the popular television show.

Known as the DS3, it is a digital sound sampling sequencer which effectively reproduces

any type of sound from a keyboard.

Linked to an Apple, it is best compared to a synthesiser. But whereas better known synthesisers such as the Fairlight and Synclavier cost around £25,000, the DS3 weighs in at only £450 with keyboard.

And, apart from the price advantage, it can reproduce sounds in a matter of seconds where traditionally high priced machines in recording studios can take days.

The DS3 sound board was originally developed for Mainframe, a two-man computer orientated pop group, one member of which, Murray Munro, is the son of Rod Munro, managing director of Greengate.

"We built one for ourselves because we couldn't even afford to hire a big synthesiser", John Molloy, the other member of the group, told *Apple User*.

With more than a little help

from computer expert David Green, the sound board was developed to a stage where it began to get noticed by the music press.

It was an article extolling its merits which finally pushed it well and truly into the spotlight.

"We were forced to start manufacturing as a result of that story appearing", says Rod Munro. "It even brought requests for the DS3 from as far away as California.

"The fact of the matter is that we didn't really appreciate how good it was".

Prior to the first machine being shipped out to a customer, Greengate has received more than 50 cash-up-front orders and provisional orders for a similar number.

On July 1, the DS3 is to receive a further boost when it is to be featured on Me and My Micro, a new Yorkshire Television show which is to be networked throughout the UK.

'That's simple' — Willie

WHAT on earth would Willie Rushton, TV personality, writer and comic, be doing at Apple '84?

"That's simple", said the cloth-capped, bearded and wry-smiling celebrity, "we have an Apple II in the family". But he

insisted it was his teenage son who was the real Apple user "with a passion and flair for programming". Then he admitted he himself was hooked on adventure games and was "learning to use the word processor part".



A much relieved David James (right) finally clinches his purchase of an Apple IIc from Ian Black of Data Supplies.

Apple denies sales 'ploy'

FOUR of the best-selling business software programs for the Apple IIe do not work with the Apple IIc.

They are Applewriter IIe, Multiplan, Visicalc and PFS File.

A delegate to the Apple '84 User Convention in Slough suggested that this might be the result of a cunning but unsubtle ploy by Apple to help promote the sale of its own integrated Appleworks program.

However Apple staff denied this vehemently and said that the various software houses involved were already developing versions of their products to run on the IIc.

"And they will probably offer an upgrade swap scheme for IIe owners wanting a IIc version", they said.

Meanwhile the clip-on LCD flat-screen for the Apple IIc will be shipped from September this year according to Neil Davison, IIc product manager at Apple UK.

The screen has been developed by Sharp and features double-hi-res graphics and a 24 lines by 80 column display. It will cost around £500.

Also being developed in the US is a briefcase for the Apple IIc that will incorporate an acoustic coupler (modem), flat-screen and a battery power supply.

Davison told delegates at Apple '84 that the development of the Apple IIe had been a relatively small step for Apple but the IIc had been a lot bigger.

He also claimed a remarkable feat for his company.

"We announced a new computer, the IIc, and just two weeks later started shipping it worldwide together with peripherals and software.

"No one else could have done that", he said.

That's determination!

AN executive of International Drilling Fluids based in Aberdeen was so keen to get hands-on experience of the Apple IIc that he flew down for the first day of Apple '84.

"I'd read about it only a few days before and this was my first chance to get a look at it", David James, the company's data processing manager told *Apple User*.

"Apart from that, I needed to look at all the latest things for the Apple, as we use them in Aberdeen, London and over in Holland".

In fact, David James was so anxious to get to the show that he arrived in Slough at nine in the morning and had to cool his heels walking round town until the doors opened an hour later.

Within minutes of getting into the Fulcrum Centre, the American - who hails from Miami - had decided he must have a IIc for himself.

Apple steered him onto Data Supplies, a local dealer and standholder, but then his problems started.

For David, in his rush to leave Aberdeen, had left his briefcase containing his all important cheque book in the car that took

Saga of DP manager who insisted on buying a IIc

him to the airport. Then problem two raised its head when he discovered that the amount available on his credit cards would not cover the cost of the machine.

Undeterred by this, he went hotfoot along to a branch of his bank only to find that the cash card machine was not working.

Several frustrating hours later - with a little help from kindly bank staff - he returned to the show carrying the necessary cash and the Apple IIc was his.

By this time, he was in danger of missing the afternoon flight back to Aberdeen. Fortunately Ian Black of Data Supplies came to the rescue and arranged for him to be driven to the airport in time.

"It was quite a day", admits David James. "I finally made it back clutching my IIc and 20 back copies of *Apple User*".

But was it all worth it?

"It certainly was", claims David. "The IIc is quite a

machine. I'm delighted with it in that it's truly portable and does everything that I want.

"And when it gets a flat screen it will be even better".

Although the American businessman has bought the Apple IIc for his own use, he also believes there is a future for it within International Drilling Fluids and other major companies.

"We have a Xerox word processing system which links us directly to Houston and other bases", he says "If we can get the IIc to work with this, then it will be ideal for our senior executives to carry around".

The IIc has yet another plus for it as far as he is concerned - he believes it may help to keep his wife happy.

"She was getting fed up with me lugging home an Apple II plus and monitor every weekend", he says. "Now I won't be clogging the house up for her and divorce will no longer be in the offing..."

Apple gives the answers

SENIOR Apple staff were put into the firing line at Apple '84 in a special "Apple meets the people" event held on both days of the two-day User Convention.

It was the first time a major computer company has put its senior personnel in front of an end user audience in a totally unscripted open forum. There were brickbats — particularly from Apple II Plus owners — but also accolades.

The main worry of the 100 or more people who attended the convention, many for the third year running, was that Apple might be leaving behind the Apple II and its huge installed base of users.

"New micros and a new and advanced Visicalc that won't run on the Apple II Plus make us feel very much that Apple is shutting us out — us being the people who by their support in the early days, helped lay the foundation of the Apple fortune today", said one II Plus owner.

The Apple team replied that they will not simply forget the II Plus people, and added that third party software and hardware developers would certainly continue to cater for such a large market.

"However, the business reality is that we have to move with the times. We have to move ahead and develop new things to stay in business" they said. "There has to be a cut off point. We can improve but we

cannot change the basic machine".

The Apple team also confirmed that the lifespan of the Apple III is not expected to extend far into the 1990s.

"There will be no further developments for the Apple III, although we will continue to support it for a further seven years. From now on, we will be focussing on the Macintosh and the Apple II family", said the

spokesman.

Another audience criticism of Apple policy was the lack of CP/M on the Apple IIc. Users said they felt Apple was trying to shut out particular areas in the micro field.

The Apple team said a CP/M capability for the Apple II would become available in the US within the next three months. A third party company was developing a box, similar to the IIc

modulator, which would clip on the back of the machine to give extra processing power.

"The IIc supports CP/M. Our original concept for the Apple IIc was to produce a different, transportable machine", the audience was told.

"We have had to be very single minded in our design choices because of the IIc's size and we went down the ProDOS, not the CP/M route".

A European attraction

PEOPLE from all over Europe attended the Apple User convention, which was held as part of Apple '84. They included contingents from the Scandinavian and Benelux countries.

They listened to Nick Levy, *Apple User's* resident Visicalc expert, and Richard Sumner putting spreadsheets and their derivatives under the spotlight with special emphasis on TK!Solver.

A later discussion of hard disc drive developments by Eric Rixon of Symbiotics and John Groves extended beyond the advantages of mass data storage to cover networking.

This began on the principle that once you have invested in expensive hardware, it makes sense to have as many people as possible taking advantage of it.

Blythe Computers' Paul

Wright followed up his successful lecture on networking last year with an in-depth investigation of database design.

In *Teaching Your Apple to Use the Telephone*, Ian Manzie of Tandata presented a whistle-stop tour around the large, commercially available databases ranging from Micronet for the home micro user through to Telecom Gold, the British business-orientated communications database.

Manzie attempted to access *The Source in America* via his Apple and the telephone failed, but he "recovered" well to present one of the best discussions of the show.

He was followed by an ambitious attempt by Janet Rothwell of the National Computing Centre to demonstrate the use of a video disc controlled by an Apple.

However, the weakest link in the chain proved to be a teletext television set which failed to cooperate.

As a prelude to the open forum with Apple staff each day, Apple's Neil Davison explained the function and the marketing strategy behind the new Apple IIc and revealed that the designers of the Sony Walkman (the machine that "created" the personal stereo boom) played a leading role in the design specification for the IIc.

Mike Glover of Leicester Computer Centre concluded the convention with a well-received interactive discussion on getting the most from an Epson printer.

The impact of the convention was enhanced considerably by the use of the latest Sanyo projection monitors which were loaned to *Apple User* by Flickers Video of Manchester.

Mac gets a 'highland' welcome

MARKETING maestro or English eccentric?

Depending on your viewpoint, either of those descriptions fit Mike Glover.

He is Leicester Computer Centre's resident proprietor, a wine connoisseur, ex-aircraft engineer, ex-glider pilot, ex-pipe major, classical guitarist, skier, *Apple User* contributor, programmer, businessman and Apple dealer.

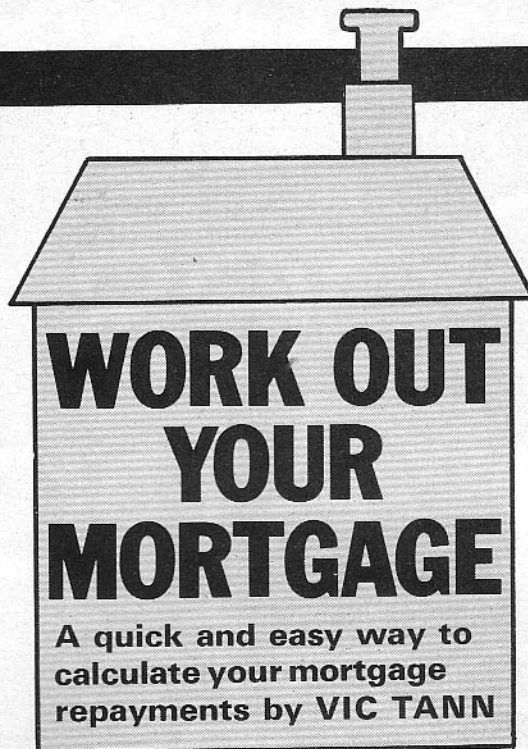
Mike's latest feat was to welcome the Macintosh to the "Highlands" of Leicestershire — actually Old John

in the county's Bradgate Park — in traditional Scottish fashion.

The Macintosh, of course is not Scottish — it was named after an American fruit. Nor is Mike Scottish, but he does love and play the bagpipes and sells, among other things, Macintoshes.

Mike recently held sway at the Apple '84 convention where he produced a lively and informative lecture on the Epson printer... without actually having an Epson on hand for demonstration purposes!





HAVE you ever wondered how those tables used by estate agents and solicitors to tell you the cost of your mortgage are calculated? This short Visicalc routine does it for you.

The formula for calculating the monthly repayment is a little frightening, but it can be built up gradually in a few cells.

For a modern Miras mortgage (tax relief at source) and with the current tax rate of 30 per cent the monthly repayment is:

$$0.7 \times I \times (1 + 0.7 \times I)^N \times \text{LOAN} \\ \div 12 \times ((1 + 0.7 \times I)^N - 1)$$

Where I is the interest rate and N is the repayment period.

This is enough to put anyone off, but don't despair!

Give the Visicalc sheet a title and then type in the labels at B5-B13, C13, D5-D8 as shown in Figure 1.

Two global commands are now required - the dollar format (GF\$) and the manual recalculation method (GRM), which allows us to set up the formulae and calculate later by typing !.

The basic data is to be inserted in cells C5, C6 and C7 so, for the time being, we will insert @NA in these cells. This avoids filling the screen with error messages.

We are now ready to build up the formula.

Cell	Formula
C8	C7/100
C9	C8*0.7
C10	1 + C9
C11	C10 C6
D13	C9xC11xC5/(12x(C11-1))

Having calculated the monthly repayment we can now set up a yearly balance sheet showing how the mortgage reduces.

The titles are simply set up in lines 15 and 16:

- A15 "Year"**
- B15,16 "Start balance"**
- C15,16 "Year interest"**
- D15,16 "End balance"**

Column A can now be set up

for the number of years. As we are in dollar format these would appear as 1.00, etc., if entered as values.

It gives a better presentation to enter them as labels, by first pressing " and then filling the cell.

I have numbered 30 years and added a little trimming.

The formulae required now are:

Cell	Formula
B18	C5
C18	@IF(B18<0.01,0,B18xC9)
D18	@IF(B18<0.01,0,B18+C18-(12xD13))
B19	D18

Note that the IF statements have been included in C18 and D18 to avoid the calculations continuing and producing negative values after the end of the loan period.

The formulae in C18, D18 and B19 can now be replicated down to C47, D47 and B47. (/R Return). All values are to be relative (R) except C9 and D13 which are to be no change (N).

All is now ready for calculation.

Enter the values of loan, term and interest rate in C5, C6 and C7 and then press ! (shifted 1) and the whole calculation takes place, giving a balance of 0.00 at the end of the term.

Figure II shows a typical printout. The example used is a £20,000 mortgage over 10 years at 11.25 per cent interest.

A	B	C	D
2	MIRAS	SCHEME	
3	=====		
4	(TAX RELIEF AT SOURCE)		
5	LOAN=		POUNDS
6	TERM=		YEARS
7	INT.RATE=		PER CENT
8	IR/100		(%/100)
9	I.R.*0.7=		
10	(1+0.7IR)		
11	(1+.7I)^N		
13	MONTHLY REPAYMENT		

Figure 1

	MIRAS	SCHEME		
	=====			
	(TAX RELIEF AT SOURCE)			
	LOAN=	20000.00	POUNDS	
	TERM=	10.00	YEARS	
	INT.RATE=	11.25	PER CENT	
	IR/100	0.11	(%/100)	
	I.R.*0.7=	0.08		
	(1+0.7IR)	1.08		
	(1+.7I)^N	2.13		
	MONTHLY REPAYMENT		246.98	
	=====			
15	Y E A R.	START	YEAR	END
16		BALANCE	INTEREST	BALANCE
17	=====			
18	---	1---	20000.00	1575.00 18611.19
19	---	2---	18611.19	1465.63 17113.02
	---	3---	17113.02	1347.65 15496.86
	---	4---	15496.86	1220.38 13753.43
	---	5---	13753.43	1083.08 11872.71
	---	6---	11872.71	934.98 9843.88
	---	7---	9843.88	775.21 7655.28
	---	8---	7655.28	602.85 5294.32
	---	9---	5294.32	416.93 2747.45
	---	10---	2747.45	216.36 0.00
	---	11---	0.00	0.00 0.00
	---	12---	0.00	0.00 0.00

Figure II

CLIFF'S COLUMN

ONE of my annoying habits — yes, I've got more than one — is to apply the McKnight criterion to new micros.

Faced with magnificent specifications for masses of ROM, RAM and RS232 interfaces, my first question is always: "Can you play Pacman on it?"

It's not that I'm addicted to Pacman. My question is more designed to elicit information about the games available on new machines.

The IIe didn't really count as a new machine. It was an improved II Plus with almost complete software compatibility between the two. Consequently, if you could play it on a II Plus, you could play it on a IIe.

I'd be interested to hear of exceptions to this rule, but so far the only problem I've heard of involved forgetting to use the Caps Lock before trying to run the game.

When Lisa was released, games were never mentioned. It was obviously a serious machine devoted to serving the needs of creative management.

However, Macintosh is a different kettle of fish and chips. The half-a-tree's-worth of paper which accompanied its launch actually mentioned games.

I've had a brief bash at a Mac, but have yet to play a game on it. So far the only game I've seen mentioned involved Alice in Wonderland dodging 3D animated chess pieces.

It's such a nice machine, though, I can't wait to see what games are produced for it.

May brought the UK release of the IIc which once again offers compatibility with the rest of the II family. Hence, you should be able to play all your old favourites.

Apple work harder than most companies at maintaining software compatibility, so I've decided to compile a list of rogue games.

Please write to me if you know of any II Plus games which won't run on your IIe or III (in II-emulation mode), and remember my list when you buy your IIc.

ONE of the other micro magazines recently carried a listing for a game which its author called "Monsters". He said it was a version of "an arcade game written by Acornsoft and others".

However Apple users would have recognised it as Apple Panic, the Broderbund classic.

It says a lot about British software writers that so many Apple Panic clones have been produced — complete with all the failings of the original... no pause facility, no user-defining, of keys.

Broderbund, on the other hand, has refined the Apple Panic concept into an even more addictive version, Lode Runner. It's not just a "Mark II" version, it's a completely new game.

The basic idea of ladders, digging and escaping from aliens (in this case Bungeling guards) is there, but in a much-improved form.

Gone are the few different ladder arrangements. Lode Runner has 150 different screens!

Even digging is a bit different, since you now have a laser drill pistol.

It's still a way of trapping your pursuers, but you don't have to bash them once they're in the hole.

If they get bricked up as the hole fills in they regenerate at the top of the screen, so digging is mainly to slow them down.

On each level you have a certain amount of gold to collect. Of course the guards are there to stop you, and one way they do this is to carry the gold themselves.

They drop it, though, if they fall into a hole. Also some of the gold requires extensive excavation to reach it. Undiggable sections of the floor and hidden trapdoors add to your problems, too.

Ladders are occasionally supplemented with hand-over-hand bars that you can swing across. In fact on some screens there is no diggable floor space, only ladders and bars.

The animation is superbly smooth, with each person having running, swinging, climbing and falling postures. Control by keyboard is a bit difficult

Lode Runner takes Panic a giant stride forward

though, and a joystick is needed for serious playing.

The reason I gave up Apple Panic was that I scored over 130,000. It took me over an hour to do it, and so a quick game became out of the question if I took notice of the score.

With Lode Runner my current record is 30 consecutive frames, which also took me over an hour. However it is possible to start on any level, which makes it much more flexible. All you sacrifice is a chance to get in the Hall of Fame since you must start at level 1 to do so.

Did I say "flexible"? As if 150 levels weren't enough, Lode Runner also contains an edit facility which allows you to create 150 levels of your own design. In fact the number you can create is limitless, but you can only fit 150 on a single disc.

Once you've used the editor to initialise a disc, you're ready to design your own screen. Building one is incredibly easy, with the usual I-J-K-M keys to move around the screen and the

10 digit keys to deposit the various bits and pieces. Working for Apple User, I'm not used to editors that are so user-friendly!

When you're happy with your work of art, you can save it to the disc and then play it. If you have only created one screen then success will lead to its reappearance as level 2. However it gets progressively faster each time you complete it.

While building a screen is easy, playing your own screens shows you how much design work has gone into the 150 that are provided.

Although Broderbund can always be relied upon to produce reasonable games, they occasionally create a masterpiece. To the list of Apple Panic, Arcade Machine and Choplifter I would *certainly* add Lode Runner.

Title: Lode Runner
Author: Doug Smith
Publisher: Broderbund
Requirements: II/II+/IIIe with 48k

When a broken mirror's lucky

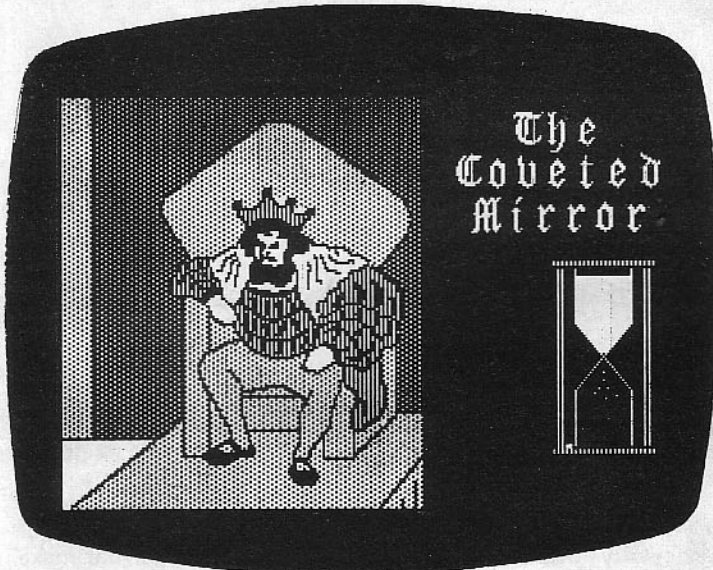
THEY say that broken mirrors are bad luck, but if someone gives you a copy of The Coveted Mirror it's your lucky day. Penguin's latest adventure game is a real beauty!

The mirror is indeed broken, and King Voar the Vermin has four of the five pieces. You are a prisoner in Voar's castle, but security is lax so you can slip out for a while by bribing the guard.

However he only allows you a certain length of time, after which you are whisked back to face Voar's wrath.

Of course if you return in time you can offer another bribe. The hourglass at the side of the screen shows you how long you can stay out and how much time you've used up.

The task, then, is to stay out for long enough to tackle most of the adventure. This means



Outwit King Voar the Vermin in *The Coveted Mirror*

collecting the relevant information, solving the puzzles, and all the things you expect from an adventure game.

In the last stage of the game you go beyond Voar's long arm, so you don't have to worry about the time then.

In true Penguin tradition *The Coveted Mirror* contains a few bits that make it different from other games. For example most of the frames contain some animation. While this may only be a smile flickering across a face, the overall effect is to further enhance the graphics.

Another difference is that within the adventure game are a few sections which require arcade-type skills. You've got to complete these if you're to succeed in your search, and to make matters worse they are time-driven.

If you don't finish them in time, it's back to Voar for another verbal lashing.

This raises another difference in that you don't get killed in *The Coveted Mirror*. Voar is a cruel man, but his natural arrogance makes him over-confident.

He'll allow you 25 transgressions, but I can't tell you what happens if you exceed this number because I completed the game before I had to find out.

There are also a couple of "quiz" sections which may test your knowledge and powers of recognition. Again, you'll have to complete them if you are to succeed.

One difference which I *really* appreciated was the save facility. The game is saved to the actual game disc, so there's

none of the usual wrist-wrenching disc-swapping.

Up to seven games can be saved and restored, which is plenty. By the time you reach the seventh, you are usually ready to over-write the first because you're well past the stage at which you first saved the game.

The game occupies both sides of the disc, but there's very little switching between sides during play.

The main reason to turn the disc over is to load one of the arcade sections. Even given this, it's a fair-sized adventure.

There's quite a bit of humour too. The people you meet have wonderful names, and their responses to offers are in keeping with their character.

This means that some thought has gone into the text handling over and above the usual "I don't understand", including the response to profanity! If you're a Penguin fan, you'll no doubt spot the adverts too.

As a straightforward adventure game *The Coveted Mirror* is maybe a little (but not much) harder than average. However when you add in all the extras, the result is thoroughly enjoyable.

Given Penguin's pricing policy, it's real value for money too. Mirror, mirror, on the wall, Penguin's the fairest of them all!

Title: The Coveted Mirror
Authors: Eagle Berns, Holly Thomason and Michael Kosaka
Publisher: Penguin Software
Requirements: None stated

IF you've ever watched a Western movie you'll know that the problem with being a gunslinger is that you have to live up to your reputation. It's not a lot different with software.

Sir-Tech has already provided the eager world with Wizardry in all its three forms (and a fourth on the way), the excellent *Star Maze* and *Police Artist*, so naturally a new adventure game from the same stable is interesting, to say the least.

Crypt of Medea describes itself as "an adventure game for the very mature and strong of heart". Given that people still ask me what I want to be when I grow up, I don't think I qualify as "very mature".

My heart strength is good, though - it's all the clean living that does it. (*If you believe that... I Ed.*)

I needn't have worried too much because it's stomach rather than heart that might be strained. In my case, my training in school paid off. We used to have a lunchtime competition to see who could describe the most revolting things, thereby causing several people to feel "not very hungry".

I later followed up this initial training with a course of listening to my brother-in-law. He worked in an operating theatre and would wait until we'd had eight pints and a chicken vindaloo before regaling us with his gory stories. By comparison,

Not your best, Sir-Tech

Crypt of Medea is tame stuff, although I can't say I'm sorry.

Given that *Bambi* gave Denise nightmares, I don't think a real video nasty would be very welcome in our household.

Although the mythologically minded among you might wonder at Medea's crypt being located anywhere in the New World, programmer's licence leads you to find yourself suddenly transported to the said crypt with no visible exits.

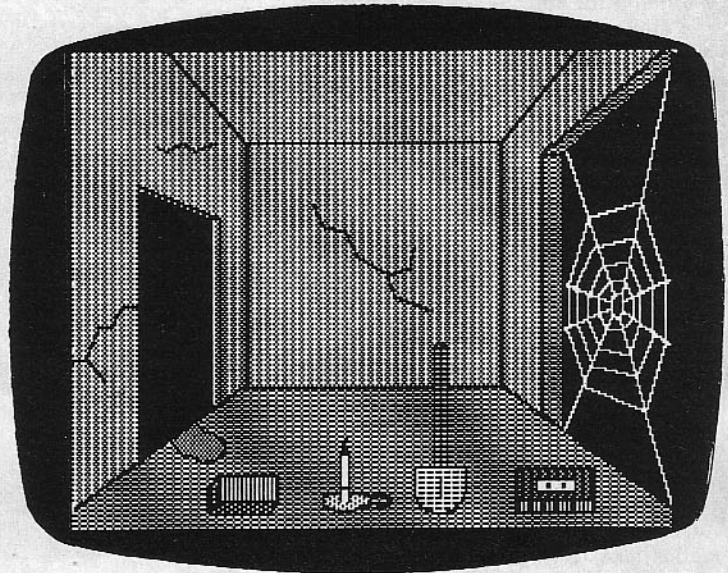
From here the game becomes a standard adventure with a few variations on format. For example, the graphics screen is displayed without any text underneath.

As soon as you type something, the full text screen is displayed with a description of the location, visible objects and exits and a prompt for your command.

The Esc key toggles between the two modes, and the game can be played purely in text mode if you get fed up with the pictures.

There is a fair bit of music and a little animation sprinkled throughout the game. It's about average size and average difficulty, and with average graphics.

The manual is a bit different



Crypt of Medea... seldom above average

since it tells you how to solve the first few puzzles by way of a playing tutorial.

It also has a list of words which the program recognises. The rationale behind giving this is to save you having to learn how to communicate.

However one of the ways of getting into a game is to experiment with its vocabulary. Even though objects aren't listed some of the verbs are a dead giveaway - why recognise "uncork" or "inject" if you don't need them?

The manual also contains a list of hints and coded answers to the hints if you're really stuck. Their presence is clearly marked, so you shouldn't find them by accident.

What is difficult, though, is to look at a single hint, given that they are all on the same page.

The game is very linear - one problem has to be solved before you can go on to the next - so you can cover the list of hints and read down them one at a time. Their presence is a temptation, though, and should be resisted if you want the satisfaction that accompanies solving the problems.

I've looked at all the hints and answers since completing the game and there's still one answer I don't understand.

The main horror element comes in the descriptions of the locations, which is why you might need a strong stomach.

If you can't stand to read that "thousands of maggots feast upon the remains of a body inside the crypt" then this is not the game for you.

Personally my stomach was more turned by the standard of spelling in the game and manual. For example, sounds "eminate" and you hear "noices".

In the manual, maggots become "magots", the crypt is described as a "mausoluem" and you feel an "erie" sense of uneasiness.

The concept of "a decapitated hand" takes some grasping, if you'll pardon the expression.

If Crypt of Medea had been released by Grunge Software, it would not have aroused any great expectations.

However, when a market leader like Sir-Tech releases something which seldom rises

above the average, I find it a little disappointing.

*Title: Crypt of Medea
Authors: Arthur Britto and Allan Lamb
Publishers: Sir-Tech Software
Requirements: II/III+IIIe, 48k, DOS 3.3*

One of the great pinball tables

IF you've got your games paddles super-glued to the sides of your Apple, the chances are it's because you're a pinball addict like me. At least Queen of Hearts carries an addiction warning, so you can't say they didn't warn you.

It comes from Strategic Simulations, a name more usually associated with games like Road to Gettysburg (was Bob Hope in that one?), Computer Bismark and Southern Command.

However the company now features a new series of RapidFire games and Queen of Hearts is the latest addition to the series.

The illustration shows the table as presented on screen, with five flippers and the usual collection of rollovers, bumpers and drop targets.

There are two ABCD lanes,

and various other combinations yield bonuses or affect the bonus multiplier. There is also a nudge facility via the space bar (but beware the dreaded TILT).

In short, the table has all the standard facilities ... so how does it feel in play?

First the good news. Queen of Hearts compares favourably with the other tables I've played, and that includes Sublogic's A2/PB1 Night Mission.

Although it can't be adjusted like Night Mission, I prefer the feel of Queen of Hearts.

There seems to be more room for skill to develop, particularly with things like keeping the ball in play and placing the shots.

It also has a free ball bonus, which I find more meaningful than the free game when you're not putting money in the machine. Up to four people can play, and a Hall of Fame saves the top 20 scores to the disc.

So what's the bad news? Well, there are a couple of little bugs in the program, the most serious of which had me leaping up and down in anger when I first discovered it.

I was sneaking another game and had toggled the sounds off, and I managed a new high score. Imagine my chagrin - to put it politely - to discover that high scores aren't saved if the sounds are switched off.

There doesn't seem to be any good reason for this (except to punish people who are playing surreptitiously - why else would you want the sounds off?) and it's not mentioned in the instruc-

tions.

On one occasion the ball stuck to the left hand side of the top left hand bumper. It wasn't lodged in between the bumper and anything else, it just stayed there and the score rolled relentlessly up and eventually over to zero again.

No amount of flipping or nudging would dislodge it, and in the end I had to reboot the disc.

The behaviour of the score during this episode suggests that if you score more than 999,999 you will start again from zero. This means that your highest score might not make the top 20.

Having scored in excess of 800,000 on at least one occasion, the prospect of breaking the 999,999 barrier is not all that remote.

There is also a tendency for one of the flippers not to be "undrawn" properly when it is moved. However this doesn't affect its operation at all - it just looks a little messy.

Also on one occasion the program failed to count one of my bonus hearts, thereby depriving me of 10 units of bonus.

A few weeks before receiving Queen of Hearts, I got a chance to play with the Pinball Construction Set, but even my best efforts were nothing like as exciting.

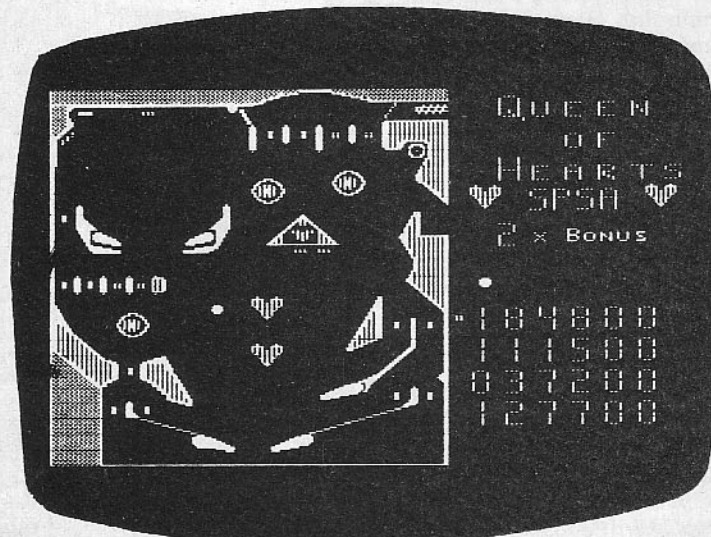
If feels as though a lot of design thought and play-testing has gone into this table, with the results being well worth the effort.

Apart from the ball stuck to the bumper, the problems don't really affect the quality.

Despite the problems, I still think Queen of Hearts rates as a great pinball table. If you want to experiment with different parameters or different layouts, then go for Night Mission or Pinball Construction Set.

If you want good, addictive pinball I can recommend Queen of Hearts. No, honest, I've got to play it again in case I've missed anything for the review.

*Title: Queen of Hearts
Author: John Lyon
Publisher: Strategic Simulations
Requirements: 48k Apple and paddles/joystick*



Queen of Hearts... plenty of room for skill to develop

THE ability of the Apple II to generate sounds was once thought to be a significant feature and many commercial programmers made great use of it.

Thus the Applesoft message SYNTAX ERROR is accompanied by a beep, some word processors use an audible signal to indicate the change from lower case to upper case, and the array of sounds produced by the many games on the market is quite amazing.

While these sounds are meaningful and perhaps amusing to the operator, they can be downright annoying to another person in the room. Their apparent volume after other occupants of the house have gone to bed is also quite staggering.

So to keep the peace – in both senses of the word – I made a small addition to the Apple II which has attracted the attention and admiration of more Apple users than I expected. It required little expertise and almost negligible expenditure.

The Apple II speaker is connected to the main logic (mother) board via a two pin Molex KK100 connector. The male pins are on the main logic board and the female plug is on the speaker cable.

The former are on the right-hand side of the main logic board (below the Reset key) and the speaker is located on the left (below the numeral 1 key) so the connecting cable is about 30cm long.

Volume control can be obtained by interposing a variable potentiometer and switch in series in the circuit between the two portions of the Molex connector.

This is merely a plug-in addition which can be quickly removed from the circuit if necessary.

As the variable potentiometer is to be used for sound control it must be of a logarithmic type and not linear. An appropriate total resistance is 1k ohm.

You will need:

- Single rotatory switch potentiometer 1k-ohm (log).
- Small knob to fit the above.
- Molex KK100 connector – male. (An equivalent is a Utilux M4030-2a.)
- Molex KK100 connector –

Keep the peace - with a quieter Apple!

By Dr. PETER C. RICKWOOD

female. (An equivalent is a Utilux M2695-2 with two M2759-TL inserts.)

- 1.25m of plastic coated multistrand wire, 10 or 12 gauge.

- 3cm of heat shrink insulator tubing to fit the multistrand wire.

It is possible to use mini push button IC test clips (or E-Z hooks) if either the Molex or Utilux connectors are not available.

STAGE 1 – Perform away from the computer.

Cut off about 4cm of the multistrand wire and solder one end to the centre terminal of the potentiometer (C) and the other end to one of the switch terminals (D).

Cut the remaining wire into two equal lengths and twist these together to form a cable.

Crimp the new female Molex connector to one end of the cable (J,K) and solder the other end (H,I) to the new male Molex connector, using heat shrink tubing to cover the joints.

Cut one of the cable wires at about the middle of the cable and solder one of the free ends to the second switch terminal (E) and the other to either the left (A) or right (B) potentiometer terminal.

STAGE 2 – Testing

Plug the speaker (female

Molex connector – F,G) on to the volume control cable (male Molex connector – H,I), and then plug the volume control cable (female Molex connector – J,K) to the main logic board (male Molex connector – L,M).

Power up the computer and run this one line program:

**10 PRINT CHR\$(7):
GOTO10**

Check that the sound is attenuated by the potentiometer and that the switch cuts it off altogether.

One wire can be connected to either the left (A) or right (B) potentiometer terminal and depending on the choice you will obtain either full volume or no volume immediately after switching on.

The former is the more convenient, allowing sound attenuation by twisting the knob in one direction and speaker disconnection in the other.

However the choice may not be yours for the quality of these potentiometers is such that sound attenuation is usually more, even using one terminal rather than the other.

So listen carefully and if your first system lacks even control – and it might even have discontinuities – then resolder this one wire to the free ter-

minal of the potentiometer.
STAGE 3 – Attach to the computer.

When the electrical work is satisfactory switch off the computer. Place a sheet of paper over the speaker to collect drill swarf.

The exterior of the Apple II case has a small rectangular depression (4cm x 2cm) above and to the left of the speaker – mark its centre and drill a 1mm pilot hole through the case.

If little pressure is used you can drill without splintering the plastic.

The potentiometer shaft is likely to be 6mm in diameter and the thread 8mm (clearance), but before drilling the second hole check the length of the thread against the thickness of the Apple case.

Remember that the thread length should be greater than the case thickness plus the locking nut thickness.

If your potentiometer thread has adequate length then enlarge the pilot hole to 8mm, insert the potentiometer through the hole from inside the computer, and fit the locking nut.

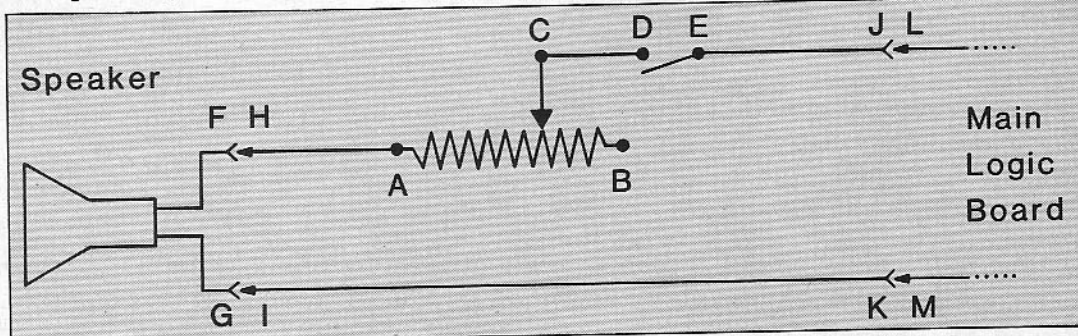
If you are less fortunate drill a 6.5mm hole and screw the potentiometer into it from behind so self tapping the thread.

To do this the cables should be disconnected from the speaker and main logic board and life is made much easier if the case cover is removed from the computer chassis (10 screws).

All that remains is to cut the potentiometer shaft to a satisfactory length – which is often not necessary – and fit the control knob.

STAGE 4 – Clean up.

Carefully remove the protective paper from inside the computer, ensuring that all swarf comes with it.



Circuit diagram for modifying the Apple's volume

APPLEWORKS

FIRST the good news. Simultaneously with the launch of the Apple IIc, Apple launched the most remarkable piece of software I have ever used. Called Appleworks it is a three-in-one package that has a spreadsheet, database (list manager) and a word processor.

Now the bad news. It will only work on Apple IIe, IIc and III – not on the Apple II or II plus.

Within the environment of a desk top, up to 12 files can be open at the same time enabling the user to switch quickly from one activity to another.

Information can be transferred between the packages by use of a clipboard, and as the package is ProDOS based, files can be freely interchanged between the Apple IIe, IIc and III.

The Apple III has an equivalent package with a different name, 3EZ Pieces – pronounced 'Three Easy Pieces'.

The ability to work on more than one file at the same time has been likened to having several computers at your disposal simultaneously. In many ways it is even more powerful, as information can be much more easily moved inside one machine from one application to another.

Much has been made recently with the introduction of 'Lisa Technology' of the user interface. We now expect – or should expect – the whole dialogue with the computer to be as easy and natural as possible.

Gone, with the advent of Appleworks and 3EZ Pieces, is the need to remember how several different packages work. For example, do you delete text to the right or left of the cursor, do you press Ctrl D, Escape, Ctrl X and so on?

With Appleworks you do much the same thing regardless of whether you are using the spreadsheet, word processor or database.

Help is always readily to hand as the combination of Open-Apple and the ? key produces a help screen showing how the commands have been implemented for the particular package you are using. These help screens can be printed by pressing Open-Apple H.

One feature I particularly like is the two different types of cursor. At any time pressing Open-Apple E changes the cursor from a solid block to a blinking underline, or vice versa.

If the blinking cursor (default) is selected, text is inserted at the

Multiply your micro with this powerful 3-in-1 package

cursor and any following text is displaced to the right to make room for the insertion.

The solid cursor lets you type new text directly over the old. The combination of the two cursors gives a useful editing capability within any of the applications.

Another useful feature is the ability to move within a document in any of the three applications using the Open-Apple key in conjunction with any number from 1 to 9.

Each work sheet is considered to consist of eight parts. Therefore Open-Apple 5 takes you to the middle of the worksheet, Open-Apple 1 to the beginning and so on.

The spreadsheet is similar to Visicalc in its commands and indeed can read Visicalc files as well as DIF files, making the decision to upgrade to this software much easier for exist-

ing users.

It is much faster and easier to use than Visicalc and allows variable column widths, and the sorting of columns. It is very large, having 128 columns by 999 rows, although not all of these can be active.

Text continues into the next cell if it is not already being used, making it much easier to type headings, although if you subsequently alter column widths the text may have to be re-typed.

The spreadsheet supports a number of different formats which can be applied to cells, rows, columns or blocks. The area is selected using Open-Apple L – for layout – and then choosing Entry, Rows, Column or Block. The actual area is then highlighted using the cursor keys.

This visual approach to working on areas of the worksheet is

A	B	C	D
Item	Cost Price	Markup %	Sales Price
ITEM1	1,000.00	30.0	1,300.00

Table 1: Column A is text left justified, columns B and D are numbers with commas to two decimal places and column C is a percentage to one decimal place.



Appleworks was previewed in Apple User in May. MIKE GLOVER has now put the product through its paces and finds its spreadsheet much faster than Visicalc or Multiplan.

convenient and is also used for other things such as copying and moving, cutting and pasting.

One minor irritation is that unless a cell already has a value in it, the formatting option will not be attributed.

For example, if I am setting out a price list I may want the headings shown in Table I.

If we now select the format desired in the various columns, those blank entries will retain the standard settings for the spreadsheet and not be overwritten by the formatting command.

After some trial and error I found I could overcome this difficulty using the following technique.

First, use the Open-Apple V command to set the standard default values - in this case values are commas to two decimal places, text is left justified. This takes care of all but column C.

Now enter the function @NA in column C using the Copy command to speed things up and format that column to % with one decimal place. From now on, when an actual entry is typed over the NA it will be formatted as required.

The worksheet may be split either vertically or horizontally

A	B	D	E
Text	N	B*C	sqrt(D)
Test text	1	1	1.0000000
Test text	2	8	2.8284271
Test text	3	27	5.1961524
And so on until . . .			
Test text	251	63,001	15,813,251
Test text	252	63,504	16,003,008
*Test text	253	64,009	16,194,277
			3976.5878590
			4000.3759823
			4024.2113513

Table II: The benchtest model . . .

	Appleworks	Multiplan	Visicalc	3EZ Pieces
Memory Free	54%	48%	67%	
Calculate	19 secs	81 secs	170 secs	13 secs
Sort row 3-255	8 secs	58 secs	n/a	6 secs
Calculate after sort	16 secs	1,920 secs	n/a	10 secs
Time to load file	27 secs	17 secs	170 secs	6 secs

Table III . . . which shows Appleworks and 3EZ Pieces are fastest in the field

but not both at the same time. Titles may be frozen.

I set up the model shown in Table II to get an idea how the Appleworks and 3EZ Pieces spreadsheet compared with Multiplan and Visicalc.

Appleworks and its counterpart for the Apple III came out well on top, see Table III.

Circular references are not catered for, nor is a warning given. However the speed of recalculation is such that you can press Open-Apple K and let the auto repeat facility take care of the iterations.

The following model shows what is meant by a circular reference for those not familiar with the term:

Sales	100
Profit	60% * sales
Tax	10% * profit
Profit	Sales-profit-tax

The calculations for tax and profit are said to be circular as each depends on the other.

To show the versatility of the spreadsheet I have included an illustration of a problem brought to me recently.

The requirement was to find

the cheapest supplier of hardware, bearing in mind that distance from the site influenced the price. To solve it I subscribed to the flat earth society - spherical trig is beyond Appleworks, and I guess, most transport managers - and divided the UK into a grid of miles east/west, and north/south.

Knowing that the square on the hypotenuse is equal to the sum of the squares on the other two sides of a right angled triangle, it is not too hard to work out the distance from site to any supplier.

If we now use the LOOKUP function we can select a price based on a table and finally the MIN function will show the lowest price. See Figure 1.

The formulae used were:

D5:@SQRT(((B4-B5)^2+((C4-C5)^2))
 G10:@LOOKUP(D5,C9... F10)
 G18:@MIN(G10... G16)

The database is a list manager which suits the requirements of most users. It is easy to use and allows up to 30 different fields.

If a field description contains the word Time or Date, then provided it is entered in the form '4/30/84' or '659 a' the entry

will be converted to April/4 84 or 6:59 am respectively.

The date format in particular is very nice as it is consistent, allowing you to sort and select by date. However it is a pity that we are obliged to use the American date (month/day/year) to enter dates.

Fields can have default values – which may be changed – and it is possible to see records in either single or multiple record layout.

Columns can be sorted by simply positioning the cursor on a record in the field you want your list to be ordered by, and pressing Open-Apple A, for arrange.

You are then asked simply whether the column should be arranged from A-Z, Z-A, 0-9 or 9-0. A lot easier than asking if you want an alphanumeric sort in descending order.

Records can be selected in two different ways. One is to use Open-Apple F, for find, which will search the entire database for an occurrence of the text you type in regardless of where it is.

The other is to define record selection rules such as GRADE equals Manager and LAST AWARD less than 1/1/83 or SALARY less than 8500. Again the use of <>= is rejected in favour of easy to understand

Page 1. 05/01/84	
File:	Functions
Report:	list
Function performs on	
@IRR	(Amount, Range) ^3EZ only
@NPV	IR, Range)
@AVG	(List)
@COUNT	(List)
@MAX	(List)
@MIN	(List)
@SUM	(List)
@IE	(Logical value, value1, value2)
@LOOKUP	(Search value, range)
@ABS	(Value)
@INT	(Value)
@SQRT	(Value)
@CHOOSE	(Value, list)
@ERROR	No arguments
@NA	No arguments

Table IV: List of Spreadsheet functions – produced using the database.

File: granite		REVIEW/ADD/CHANGE			Escape: Main Menu			
1	Location	North-south	East-West	Miles	AppleWorks spreadsheet model.			
2					Finds cheapest raw material			
3					Supplier by calculating			
4	Site	12.30	23.00		distance from site and then			
5	Supplier1	12.30	129.00	106.00	uses look-up tables.			
6	Supplier2	7.20	67.00	44.29				
7	Supplier3	60.00	23.00	47.70				
8							Cost	
9	Supplier1 Charge	Band	0	100	200	999		
10		Cost	25.50	26.50	27.00	29.00	26.50	
11								
12	Supplier2 Charge	Band	0	30	60	999		
13		Cost	24.00	25.00	26.00	27.00	25.00	
14								
15	Supplier3 Charge	Band	0	40	120	999		
16		Cost	25.00	27.00	29.00	30.00	27.00	
17								
18	By- Mike Glover Leicester computer centre					Cheapest		25.00
D6: (Value, Layout-F2) @SQRT(((B4-B6)^2)+((C4-C6)^2))								
Type entry or use @ commands							@-? for Help	

Figure 1: Problem solving using the spreadsheet

words like EQUALS, CONTAINS, BEGIN WITH and so on.

Reporting is very easy to set up and formats are designed on the screen, altering field widths by means of the arrow keys in combination with the Open-Apple key. Formats can be either labels or tables and the report formats can be saved with the file itself.

The date and title of a report can be printed with it and this is the default condition. Fine if you are producing a tabular report but not so good if you are producing mailing labels.

It is therefore important to remember to turn off Titles if producing labels. I also found it helpful to set the report length to the same length as the label – that is, for labels that are six deep set the length to one inch.

Tabular reports may have up to three calculated categories.

Table IV is a list of the Appleworks spreadsheet functions that I produced using the database.

The word processor works on the principle of what you see laid out on screen is what you get when printing out. Text can be moved to it from the other applications simply by printing a report to the clipboard and pasting it in.

Within the word processor text can be moved by pressing Open-Apple M and highlighting text with the arrow keys, pressing Return and then selecting the new location also with the arrow keys.

This visual approach is so much easier than trying to remember markers.

Standard formats can't be

	64k	128k	Apple III 256k
Spreadsheet	1,800 cells	6,000 cells	11,000 cells
Wordprocessor	8 pages *	26 pages *	66 pages
Database	250 records **	850 records **	2300**
Clipboard	250 lines	250 lines	250 lines

* Assumes record size of 75 characters
** Based on average record of 75 characters

Table V: The size of an Appleworks/3EZ Pieces document is dependant on available RAM

saved but this shortcoming can be overcome by saving a blank but formatted file, loading it and using the Open-Apple N feature to rename the file. Much the same as creating a stationery pad in Lisa.

I was unable to find a command to right justify text, which I found rather irritating.

Appleworks supports up to three different printers, one of which may be user defined. This means that you can set standard features such as bold face, underline, superscript and subscript as you define a printer.

It also means that you can't bury control codes in the text using the conventional parallel printer cards currently available.

Some users may come to grief with the way their printer card treats control characters.

Most Apple software sends those in a form known as negative Ascii. Appleworks does not, and this means that a number of popular printer cards will not perform properly.

It would be wrong for me to say what doesn't work. However I have tested both Apple interface cards and the Blackboard with this program and they work well.

The manual supplied with the Apple III version of 3EZ Pieces was disappointing and does not match the very high standard set by the software. I confess I didn't really study it until I had been using the product a while – by which time the help screens were more than adequate for most of my needs.

I like manuals to have a

	Database	Spread sheet	Word processor	Screen
Printer	x	x	x	x
Clipboard	x	x		
Screen	x			
DIF File	x	x		
Disc	x	x	x	
Ascii file on disc	x	x	x	

Table VI: What goes where

tutorial and a formal reference section plus a quick reference guide – the 3EZ Pieces manual was not organised in this way.

I believe a first time user may have a hard time trying to understand some of the concepts of modelling or database work without some hand holding in the early stages.

I also dislike being told to refer to my owners manual for information on things like pathnames and copying.

The documentation of Appleworks however is superb. The manual is comprehensive and easy to use in typical Apple style and is divided into a 155 page tutorial and a 280 page reference manual. It also has a quick reference guide.

As an added bonus there are two tutorial discs which guide the user through all the aspects of the program and the concepts of spreadsheet, word processing and list management.

Apple expect that Appleworks should do for the Apple IIe and IIc what Visicalc did for the Apple II. It deserves to do much more than that.

Product: Appleworks/3EZ Pieces.

Description: Integrated spreadsheet, database, word processor.


Price: Appleworks £175, 3EZ Pieces £295.

Distributor: Apple/Haba.

GLOBAL COMMANDS			
	SPREAD SHEET	WORD PROCESSOR	DATA BASE
OA-E	Change edit cursor		
OA-H	Hard copy of screen		
OA-Q	Quit and select new file		
OA-S	Save current file		
OA-?	Get help screen		
OA-A	Arrange (Sort) column	N/A	Arrange (sort) category
OA-B	Blank entry(ies)	N/A	N/A
OA-C	Copy entries (inc. cut & paste)	Copy text (inc. cut & paste)	Copy records (inc. cut & paste)
OA-D	Delete (rows/columns)	Delete (text)	Delete (records)
OA-F	Find (text or cell)	Find occurrences of	Find records that contain
OA-I	Insert (rows/columns)	N/A	Insert (new record)
OA-J	Jump to other window	N/A	N/A
OA-K	Calculate all values	Calculate page numbers	N/A
OA-L	Change layout	N/A	Change record layout
OA-M	Move entries (inc. cut & paste)	Move text (inc. cut & paste)	Move records (inc. cut & paste)
OA-N	Change name of file	Change name of file	Change name of file insert/delete/rename categories
OA-O	Options for print formatting	Options for print formatting	N/A
OA-P	Print	Print	Print reports
OA-R	N/A	Replace occurrences of	Record selection rules
OA-T	Set/remove titles	Set/clear tabs	N/A
OA-U	Edit Contents of cell	N/A	N/A
OA-V	Set standard values and rules	N/A	Set/remove standard values for category
OA-W	Windows (set/one)	N/A	N/A
OA-Z	Zoom (in formulae out values)	Zoom (show or not printer options)	Zoom (in one record out multiple records)
OA-Space	N/A	Sticky space	
OA-"	N/A	N/A	Copy entry directly above (multiple only)
Ctrl-B		Begin/end Boldface	
Ctrl-U		Begin/end underline	
MOVEMENT			
Arrows	Move a cell	Move the cursor	Go up or down
OA-Arrows	Move one screen	Move screen (up/down)	Move one screen
Tab	Move left one cell	Move word (left/right)	(forward or back)
OA-Tab	Move right one cell	Go to next tab stop	Go to next category
		Go to previous tab stop	Go to previous category
OA-1 to OA-9	Move through file		

Table VII: Appleworks/3EZ Pieces command summary

After the victory

 Satisfying though it is to beat Apple at Scrabble, I have realised that it is possible to print out the final hi-res screen – provided that you have a graphics driver or

graphics printer interface card for your Apple.

At the end when it says:
START AGAIN (Y/N):

Don't do either, instead:

Press Reset

Ctrl B Return


Switch on printer

PR#n Return, where n is the slot in which the printer card sits.

Ctrl Q Return or whatever codes are appropriate for the printer/printer card used.

William G. Watson

Appletips

 IN an Appletip in the April 1983 edition of Windfall Alan Dubost mentioned that POKE 1010,102 and POKE 1011,213 makes RESET = RUN.

This works fine except that DOS is disabled. You can do the same job and at the same time keep DOS active with:

POKE 40286,102 and POKE 40287,213

Azwan Khan, aged 13, Kuala Lumpur, Malaysia

Automating CP/M using a pseudo disc drive

By PETER WILSON

I USE a 128k pseudo disc RAM card for all sorts of applications, such as a data disc for my Omnis database.

This has the advantage of even greater speed than a hard disc for searching and sorting my data without the normal wear on the floppy.

The pseudo disc came with several programs, of which the CP/M one interested me most.

Now I can put my favourite word processor Wordstar on to it and use the available space to create letters without the consequential slow working and annoying "WAIT" sign every time the program calls for a message to be displayed.

There are, however, two problems associated with this way of using the pseudo disc. One concerns the available space after you have put the Wordstar COM file together with the two OVR (overlay) files on to C.

The pseudo disc is identified by CP/M as C:

This leaves you with only 32k of pseudo space left, which is only 16k of file space as Wordstar makes a BAK (backup) file of the one you are working on as big as the original.

You can, of course, increase the space available to your files by leaving one of the overlay files - I prefer WSMGS.OVR - on B: drive, that is drive 2, which will leave you with 60k of space - enough to make it worthwhile.

The other problem is the time it takes to get it all ready before you are able to get cracking.

This is also true of any program which takes several moves before you can use it or indeed if you want to make a program run automatically on booting up the system. To get

round this I put the name of the program I wanted to run when starting up the system on to the disc within the CP/M system tracks.

Using Bag-of-Tricks (reviewed in *Windfall*, September, 1982) boot up Zap and then change to a test disc which has been formatted in CP/M together with the system tracks copied from the master disc by B:=A:/S from within COPY.COM.

Tell Zap that you have a

CP/M disc by typing CPM and then read track 0 sector 0D (enter R0, 0D).

You should now see the copyright notice from Digital Research on the right hand side of the screen on lines 3 and 4.

If not, carry out a search for it by entering L"COPYRIGHT" and Zap will find it.

The following should be entered as typed, including the inverted commas.

Enter a 7 to take you to byte 7 on the top line (if you had to

search for the copyright notice do an R (for read) to take you to the first byte on the first line, then enter a 7) which will probably be 00.

Enter :05 and then Return.

Enter 'SUB' or the name of the program you want to run automatically from system startup. Return.

Enter :20 Return or 00 in the case of the above.

Enter 'HELLO' Return.

Enter :00 Return.

The main block should now

MAKE WORDSTAR WORK

YOU cannot take advantage of many of the printing capabilities of the Epson RX-80 (or MX-80 or MX-100) when using the version of Wordstar distributed by Micropro International for the Apple unless you change the user-addressable printer/driver routine.

When I bought my copy of Wordstar I didn't like its underlining method. So I decided to see whether I could use the underline built into the Epson itself, and as I don't use a two coloured ribbon I thought I would try to alter the CONTROL PY command to send the ESC "—" required by the printer.

I found the four user-defined functions and decided I also wanted to use italics (alternate character set), the enlarged mode and the emphasised mode for letter quality print.

The choice of special functions is yours however, and I will attempt to show how you can select a foreign language set instead of these choices or indeed instead of another unrequired Wordstar feature.

The following procedure

shows the CP/M-way how to modify their Wordstar.

Here's how to do it (follow all CP/M prompts):

Place the CP/M Master in drive A and a new disc in B.

Format the new disc using the command FORMAT B: and then copy the operating system to the new disc using COPY B:=A/S.

Remove CP/M Master and place your copy of Wordstar in A. Copy the Wordstar disc using COPY B:=A:

Remove disc in B. This will be your modified copy of Wordstar. Put it to one side. Then remove Wordstar from A. You will not need this again.

Place CP/M Master in A and a new disc in B and format the new disc using FORMAT B:

Copy DDT.COM onto the new disc using PIP B:DDT.COM=A:DDT.COM.

Place recently-made copy of Wordstar in A and copy WS.COM to new disc in B using PIP B:WS.COM=A:WS.COM

You are now ready to start editing the Wordstar program using DDT (Dynamic Debug-

ging Tool).

Type B: to switch drive B to logged drive, and type DDT B:WS.COM. This loads DDT and the program to be debugged, WS.COM.

When the DDT prompt "-" appears type S06C9 and RETURN on the screen. The number 06C9 should appear followed by 00.

Location 06C9 is the first of five bytes available for user definition 1.

When Ctrl PQ is accessed in a document this byte is checked and tells the program how many bytes follow that must be forwarded to the printer before the rest of the text is printed. Because it is presently 0, nothing is forwarded.

I chose to use this for switching on the expanded print mode. The Epson requires the shift out character (SO) for expanded mode, therefore location 06C9 is changed to 01 (one byte to be read) and the next location to 0E, the hex value of SO).

Type 1 and then Return. This changes the value at 06C9 to

read the following from the seventh byte.

**05 D3 D5 C2 20 C8 C5 CC CC CF 00
SUB HELLO**

If you are using my example this will be translated on the right hand side as SUB HELLO. You can of course enter any name here as long as you obey the rule of ending the entry with a double zero and using 20 to split up any words.

When you are satisfied that all is correct enter UNLOCK WRITE to tell Zap to write the changes back to your disc.

The hard part is now over. In the above example we need to create a file on your boot disc named HELLO.SUB to carry out all the repetitive tasks which up to now you have had to enter each time you ran that program by hand.

Using your favourite text editor create a file called HELLO.SUB which contains all of the tasks as already discussed.

When I want to use my

pseudo disc I have to run INIT.COM, PIP Wordstar and the overlays I want onto the pseudo drive, transfer any DOC files to the pseudo drive and then invoke Wordstar, by which time I've probably lost all track of what I wanted to do in the first place!

With our example you would create a file which looks like:

```
A: INIT
PIP C:=A:WS.COM
PIP C:=A:*.OVR
PIP C:=A:*.DOC
C:
WS
```

If you don't have a text editor you will have to use the free editor which comes with CP/M called ED. If you haven't used it before then follow closely.

With ED.COM on your test disc enter:

```
ED HELLO.SUB <Ret>
```

You will be presented with a colon and an asterisk.

Enter an I (for insert text) followed by Return. You should now have 1: on the screen.

Next enter the first line of the file and then a Return:

```
1:A:INIT Return followed by the
rest of the file
2:PIP C:=A:WS.COM
3:PIP C:=A:*.OVR
4:PIP C:=A:*.DOC
5:C:
6:WS
7:
```

At this stage enter a Ctrl-Z by holding down the key marked Ctrl and also hitting the Z key. Nothing will appear on the screen except you should now be back with a :*.

Enter an E (to Exit and save your file) which will return you to the CP/M level with the CP/M prompt A>.

If at any time things don't go quite right on the above then enter Ctrl-C which will exit from ED without saving anything except an empty file named HELLO.SUB and another one marked HELLO.*** (which is a temporary file created by ED).

These can be deleted by ERA HELLO.* - which will remove

them both - and then you can try again until you get it right.

Now PIP the files you have named on to the appropriate drives together with SUB.COM - I renamed SUBMIT.COM to SUB.COM - on to Drive 1.

The moment of truth has arrived. Open your drive doors, switch off, wait for a few seconds and then switch back on. Close the drive doors - and all the things you have put into HELLO.SUB should start to happen automatically.

When you have proved that it works correctly, you may well want to go on and try different things on different discs.

This is where it is easy, for all you have to do is create a separate HELLO.SUB file for each disc and transfer the hard bit by using COPY.COM, entering B:=A:/S and using your test disc as the master.

This will transfer your Zap entered details onto each disc you put into drive B:.

Go on try it - you will find it easy.

ON YOUR EPSON By STEVE YOUNG

01. The next location number should have appeared on the screen so type 0E then Return to change it to the character we want.

Press Return three more times to get to location 06CE and (start of USR2) and enter 1 then Return. Next location should appear (06CF), enter 14 (hex value of DC4, expanded print off) then Return.

Now when the embedded commands Ctrl PQ (^Q) and Ctrl PW (^W) are used in text expanded print will switch on and off respectively.

Press Return three more times to get to the beginning of USR3 (location 06D3). For USR3 I chose the emphasised mode which requires two bytes - Escape E - therefore the first byte must be 2.

Type 2 Return. When the next location appears, type the hex for Escape 1B and then Return when the next location appears type the hex for "E" which is 45 and then Return.

Press Return two more times to get to the beginning of USR4 (location 06D8).

I chose emphasise off for this function which also requires two bytes - ESCAPE F - therefore enter 2 Return.

When the next location appears type 1B Return, when the next location appears type 46 and then Return.

The locations I have used are those built into Wordstar for customising your copy to your own requirements.

In addition to these locations I found that several Wordstar print functions had no use to me using an Epson printer and could be changed in a similar manner to that used to change the USR functions, specifically the select alternate pitch, return to standard pitch and, as mentioned earlier, ribbon colour.

To get out of DDT and save your modified Wordstar enter a "-" after the next location and press Return. This will exit the change mode of DDT and give the prompt "--".

Enter Ctrl C which will exit DDT and give the normal CP/M B> prompt.

Save your new version of



Wordstar as NWS.COM, using the command SAVE 67 B:NWS.COM.

Type A: to switch drive A to the logged drive and finally copy this version on to your disc in drive A using PIP A:WS.COM=NWS.COM

The version of Wordstar you have made now contains the extra functions, enlarged mode on (^Q), enlarged mode off (^W), emphasised mode on (^E) and emphasised mode off (^R).

If you want to alter any other commands use caution in case they conflict with the operation of Wordstar.

I suggest that the ^Y ribbon colour toggle could be used for any other Epson function.

As it is a toggle switch the same control character is used to switch on and off. The

location of the first byte is 06DD with four bytes for the string. The next time ^Y is accessed Wordstar looks to location 06E2, which also has four bytes for a control string if required.

Another Wordstar function which isn't used with the Epson is alternate pitch on and off (^A and ^N).

Though this location is not as flexible as the others previously mentioned because only one byte is checked for the length of the string both must be of the same length.

The location of the first byte is 06B5 - the first string starts at 06B6 and the second at 06BA.

These and other modifications can be carried out using the procedure laid out above.

IT does not matter whether you are designing a financial model for budgeting or a database for providing management information – or writing an article for a magazine. The chances are that you are not going to like the first version of your finished work.

No matter how much careful planning and thinking has gone into the design of whatever model or form you have been trying to develop, you should be prepared, physically and mentally, to abandon your first efforts and redo the project at least once or twice.

I would go further, and suggest that even if you are satisfied with the first version you should discipline yourself to produce a second – and discover for yourself how inadequate the so-called perfect version was.

You might be interested to know that there is a high falutin' word for the agonies you have to go through as a model developer and a form planner. It is called iterative enhancement.

The good news is that the process of iterative enhancement can itself be vastly enhanced if you observe some secret rules and regulations only known and practised by "professionals".

Observing these simple rules will avert constant head banging – in other words they will enable you solve problems for which there seem to be no solutions.

This month we are going to look at how to organise a relational database. Basically, this is a two-dimensional table consisting of horizontal rows and vertical columns.

So far this definition would fit the description of a Visicalc screen, so what is the difference?

It is not very clear cut, and several of the new generation of electronic spreadsheets which can be described as "the sons and daughters of Visicalc" actually combine the facility of being able to use the same rows and columns either for financial modelling or as a database with powerful sorting, searching and retrieval capabilities.

The basic characteristic of a

Three rules for good database organisation

relational database is that no two rows may be identical.

Suppose for example that you keep records of the names and addresses of the employees in your company, including the names of each employee's children. The first thing you have to do when designing your database is to find the maximum number of children that an employee could have.

If you fix that number to, say, six, then provision will have to be made in the database to allocate 6*9 characters = 54 bytes per record, for the children of each employee.

It does not matter if an employee has no children or just

Rule 1: Each cell must contain only one item of information.

one or two. The same amount of space has to be allowed.

And if a new employee who joins the company has seven children this could create problems for your database.

So you either do not recruit employees with more than six children or switch to a more

flexible and economical database system!

It follows that if you are looking for a database program that can handle relatively vast amounts of information on a personal computer you will need to split your files and find a program that can extract information from different files.

Having found such a program, your problems are not yet over. There is an art in splitting a large tabular database model into a number of smaller tables.

Three fundamental rules must be observed. If they were not followed it would be impossible efficiently to retrieve information in a specified format from the various sub-files.

The best way to describe and state these rules is by demonstrating how *not* to enter data in a tabular form when splitting large amounts of information into constituent compartments.

Suppose you are running a detective agency and decide to computerise the information you have on suspects in your files – and remember that we are trying to present all the information in rows and columns.

The first name in your list (with apologies to any reader whose name may appear

among the fictitious underworld characters I will mention) is Bogard.

According to your records he used to work as a safe cracker in association with Armstrong. He also used to work as a driver in association with Butler and his gang.

So you create in your database a column Name under which you record the name Bogard, and a second column Associates under which you record Armstrong, Butler.

This is wrong, because the first rule in designing a database is that each cell – that is where a column intersects with a row – must contain only one item of information or a single value.

Therefore the two associates Armstrong and Butler cannot share the same cell in a spreadsheet even though their names are separated by a comma (and even though they did share the same cell when they stayed together in prison) – each of them must be entered into a separate cell.

Next imagine yourself entering the following information in a tabular form: Under Name you

Rule 2: All columns must relate directly to all the key columns.

enter Bogard, Under Associate you enter Armstrong and under Occupation you enter safe cracker.

Nothing wrong with that on the surface – but again this design is inappropriate because the key column is Name and all the other columns in the same row should relate directly to the key column.

The column Occupation, however, only relates to the key column Name via the column Associate. Note that when Bogard works with Butler, Bogard's occupation is driving.

There is no direct relationship

“**Second thoughts are often best, is the advice of NICK LEVY, as he discusses the finer points of relational databases**”

between Name and Occupation except by the column Associate and so this entry violates the second rule of good database organisation, which states that in every row all the columns must relate directly to all the key columns (there could be more than one key column), without any intermediate dependencies via other columns.

The third rule follows from the second. Imagine making the following entries - Name: Bogard, Year of Birth: 1935, Occupation: safe cracker.

How can such a simple entry possibly be faulted? The problem this time is that in this entry there are two key columns which identify our man, namely Name and Year of Birth.

But the column Occupation has no relationship to the key column Year of Birth. And as the

third rule for good database organisation states that in every row each non-key column must have a direct link to each and

Rule 3: Each non-key column must have a direct link to every key column.

every key column, making the above entry is again not conducive to good database organisation.

You must be wondering by now if, in view of all these rules and regulations, it wouldn't be

better not to split a large database file.

The fact that a single database file requires more memory than split files containing the same amount of information is, after all, not so much of a problem, considering that adding extra memory to an Apple, where possible, does not cost too much money.

So why bother, even if processing the information in a single file takes longer than the time to process information from split files?

Quite simply there is no reason why you should not keep things your way, but don't blame the computer when your colleagues start complaining that your management information system is too cumbersome.

Finally, I would like to thank all those readers who sent me

solutions to the problem I was trying to solve using the TKISolver (Apple User, April 1984, Page 18). I want to thank specially E. Johnston, technical director of Lekro Designs, John Robertson of Rover Maine Systems, who solved the problem very neatly on Visicalc, and David Fisher, scientific editor and computer programmer, who was outraged at the high retail price of the TKISolver.

Mr Fisher claims he has developed a similar program which he plans to market for £30. Incidentally Mr Fisher, the problem with the cyclists was described correctly and the answer is correct!

● Some of the solutions to the TKISolver problem sent in by readers are printed in Feedback on Pages 66 and 67.

Do

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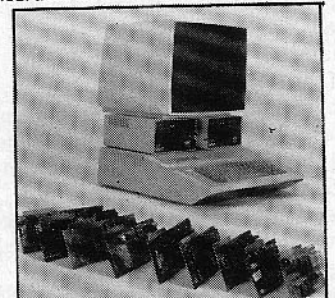
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ANYONE experienced in writing a computer aided design program for the Apple will know that limitations of memory size and poor screen resolution are a significant burden to development.

So the advantage of using a dedicated higher resolution graphics board such as the VGP card by Digisolve is clear.

Not only does it give an acceptable 512 x 512 pixel screen, but it frees the huge chunk of memory consumed by the hi-res screen buffer by using 64k of on-board memory for the two graphics pages.

This is the hardware configuration required for Capitol, a three dimensional computer aided design package developed and tested by designers at Teesside Polytechnic Department of Design and Engineering.

Capitol comprises a suite of five programs – Create, Digitise, Erase, Photo Target and Rotate.

Create is the main program for developing ideas in three point perspective. To understand its operation it is important to grasp the axes convention common to the whole suite.

The screen represents the $x=0$ plane, with +ve x axis coming out towards the viewer,

–ve going away into monitor, –ve y axis to the left and +ve y to the right – similarly –ve z goes vertically down while +ve z goes vertically up.

No scale is necessary since dimensions are all in millimetres and one can easily judge these on the screen.

The hi-res monitor is connected directly to the VGP card and is calibrated by measuring a horizontal and a vertical line in millimetres.

All commands refer to the x , y and z ordinates of the screen rather than the objects. This

makes for an easily identified concept of the program and the three dimensional space in which the objects reside.

Apart from Digitise, the method of interaction is via the keyboard. Single word commands – capable of being abbreviated to two letters – are typed in, and are generally followed by one or more parameters.

These are displayed line by line, giving the designer a record of his last 24 commands.

Objects are described to the computer in three ways. The

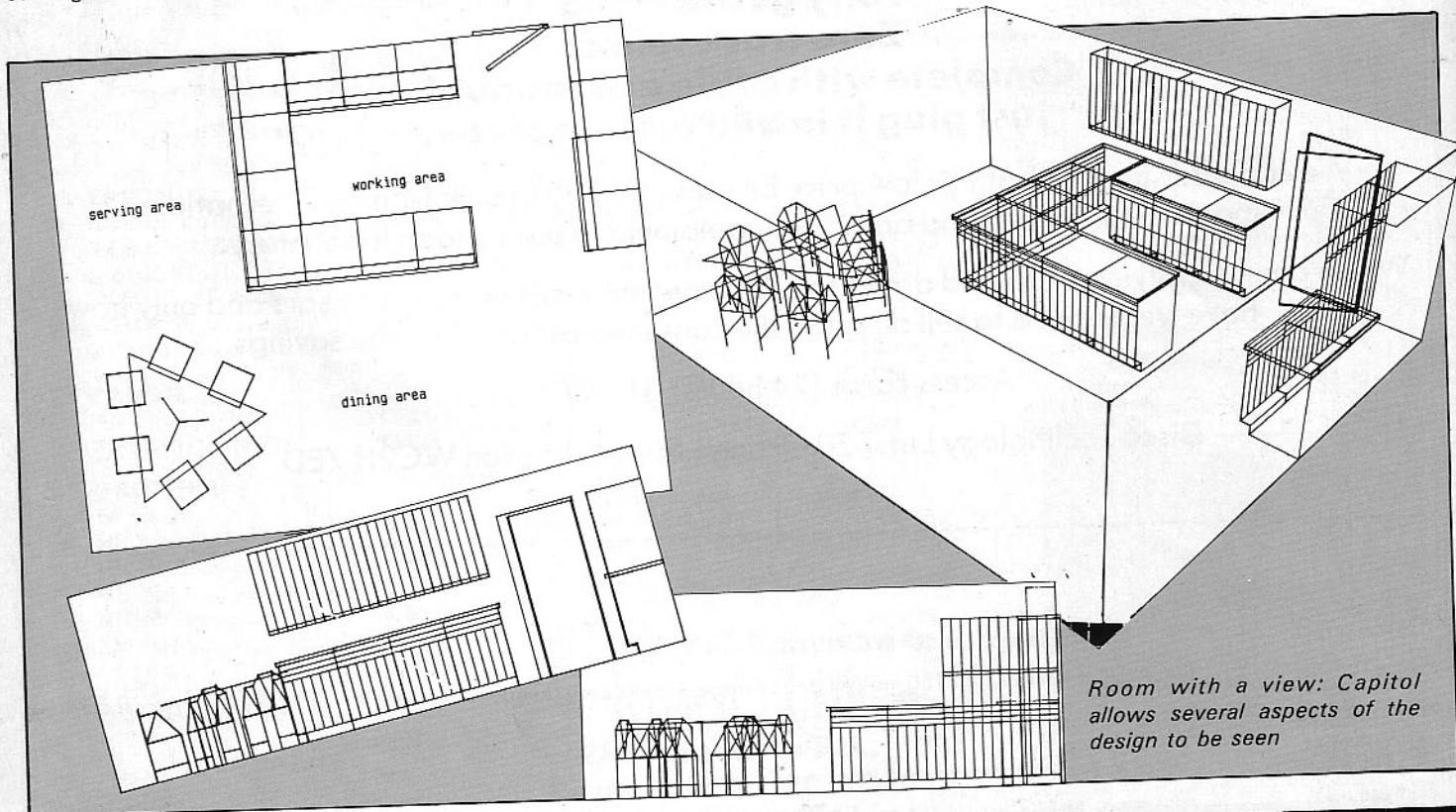
simplest is to recall standard Euclidian primitive shapes which are stored on disc. Once displayed they can be subjected to numerous transformations including scaling, rotation and twisting to change them into any other topologically equivalent shape.

Building up a scene of many objects is simplified by group manipulation commands which include SPREAD, SWAP, PACK and ADJUST.

ADJUST provides for the minimum centre or maximum 3D coordinate values of objects

Add a whole new perspective to your design ideas

Architect PAUL NICHOLSON describes Capitol, a versatile wireframe CAD system for the Apple



Room with a view: Capitol allows several aspects of the design to be seen

to be adjusted to an x, y or z plane.

PACK allows objects to be positioned side by side. Non-orthogonal objects are assumed to be contained within a bounding box, which is used when PACKing objects together.

The repertoire of shapes can be added to by using the second method of describing them – the DATA command. This allows the designer to describe the 3D coordinates of a shape together with line data. Using this facility other shapes may also be edited or amended.

The final method of shape input is via the Digitise program. A drawing is taped down to the graphics tablet and the lines are traced with the stylus.

The tablet menu is provided in the manual to allow for digitising points, lines or free-form shapes. There is also a facility to square up the traced lines if they fall within a pre-defined tolerance from the vertical or horizontal.

My only criticism of the Digitise program is that while the screen displays the image as it is entered, there is no visual feedback of stylus position, so without a drawing to trace from you get lost on the tablet.

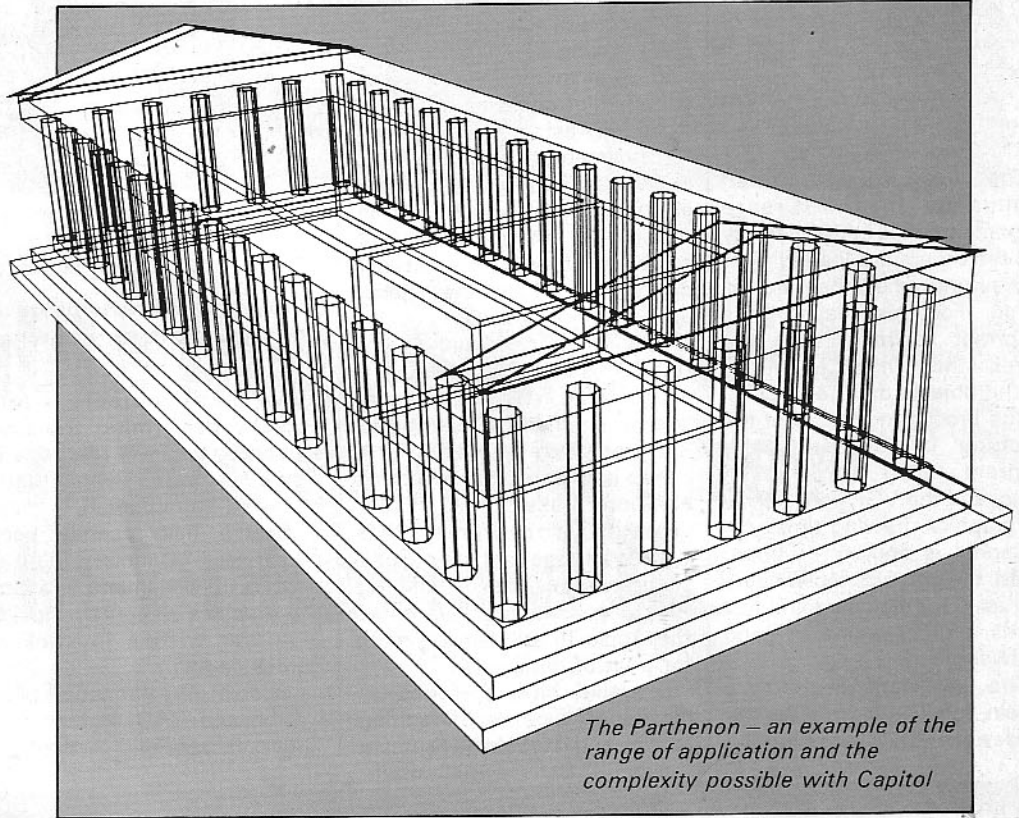
Having created either a two or three dimensional object, various commands are available to alter the geometry. Extrude can simply produce an extrusion of a 2D shape producing, for instance, a cylinder from a circle, or walled room from a floor plan.

A 3D extrusion from a 3D shape can produce unusual results and illustrates part of the fun of using Capitol.

TWIST and WEDGE permit the designer to distort shapes. The first allows an object to be twisted a specified amount in the x axis, while the second might be used to create a pitched roof from a cube.

One of the facilities designed to help animators is Metamorphose which allows the in between objects to be automatically generated between two or three dimensional shapes.

The start and final shapes are first described using any of the techniques mentioned above. The start shape is then simply duplicated as many times as in



The Parthenon – an example of the range of application and the complexity possible with Capitol

between are required. Then one by one they are topologically transformed to a proportion of the final shape.

Double curved surfaces are usually very tedious to describe to the computer. However where one of the surfaces can be described by a surface of revolution, the three dimensional shape can be generated using the Capitol program Rotate.

A profile is first drawn, usually by digitising it from the graphics tablet. It is then resolved to produce a solid. There is a great deal of control over the process so that a revolution of 360 degrees or less can be selected.

The solid can be generated using any number of hoops or ribs or both, which gives a mesh.

All these transformations are made visible on the hi-res screen by a View command. If this is not selected, successive manipulations are previewed by being drawn on top of each other in a dotted line.

This makes the effect of the transformation clearer.

Once the previewed image begins to appear, the process can be interrupted and the next command given.

VIEW will erase the screen and then display the currently selected objects in solid lines. It has up to six associated parameters, which permits an extremely versatile manipulation of the image rather than the geometry of the objects.

There are two methods of permanently reproducing the screen image, by plotting or by photographing it.

The Plot command is accessed via the Create program and uses the same parameters as View.

If you prefer a photograph of the screen image, a useful facility called Photo Target will help you determine the best camera settings.

The final program, Erase, allows the selective removal of lines from the screen image, and

is designed for use before producing a hard copy.

Hidden lines, for example, may be selectively removed but it is important to remember that Erase treats the screen image purely as a two dimensional drawing, the commands available allowing the drawing to be cleaned up rather than permitting 3D objects to be edited.

Software includes the facility to save designs onto floppy disc with the option of consolidating them under one name or saving them individually.

The file catalogue can also be displayed. Finally, typing Help will display a summary of available commands and their actions.

Capitol relies on the Digisolve VGP card and expects to find it in Slot 3. A choice is given for locations of the other peripheral interface cards. But it ought to be possible with a package of this calibre that relies heavily on its peripherals to run a configuration program to designate the slots and save this on the master disc.

Using the VGP card for the screen buffer frees all the Apple memory for program and data

● **This month's Apple User cover features a stereo pair image of a chair. The picture was created using the Capitol 3-D CAD package reviewed here.**

plus the standard utilities. However Capitol still requires 64k of memory.

A maximum of 50 objects can be held at any one time with a total of 1,200 points and 1,200 lines.

The most frequently used commands in the Create program are held in the memory and the others are loaded from disc as and when they are required. For this reason it is important to have two disc drives since Drive 2 is used for the objects data file disc.

The processing speed of the machine is very fast, the program being in compiled Basic, and the VGP card halves the graphics drawing time.

Capitol is entirely keyboard based, the graphics tablet being only used for digitising and this seems a great waste of good hardware.

The keyboard requires a certain familiarity in order for the designer to use the program

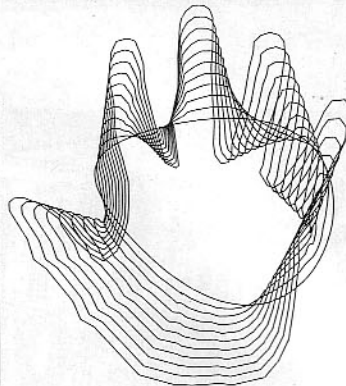
at a satisfactory speed, while the syntax of the commands is rigid making so called interaction often infuriating. The graphics tablet could be exploited more fully as an input device.

Documentation consists of more than 70 pages, excluding illustrations, of which half is devoted to tutorial notes and exercises. There is also a tutorial disc which contains the objects used in the exercises.

Any lack of understanding of functions or ambiguity encountered in the main manual is soon clarified by referring to the appropriate tutorial.

The hardware-software combination makes this a very versatile wire frame CAD system and the authors may be congratulated in shoe horning such a complex package in to the Apple II, still leaving room for a lot of data.

I would have preferred to have seen a better 3D editing facility, and it would be useful to



Example of Metamorphose in two dimensions

view many objects while actually performing transformations on a few. The suite is however being continually reviewed and updated.

Sketch has recently been added as a 2D input routine. It permits the designer to draw on the graphics screen by moving a cursor with a joystick or games paddle.

One of the benefits of a microbased CAD system over larger installations is that the

thinking time does not carry the penalty of wasting valuable computer time and money.

For this reason, it must appeal to all those who design in three dimensions and require a tool to augment their traditional habitual scribbling for, as the manual states, "developing ideas in three point perspective".

Since this review was written, the package has been updated in the following ways:

- Rev 8.0 colour VGP version - can assign colours and line styles to objects.
- Stereoscopic pairs - projection of objects in red and cyan.
- Support for multiple discs and controllers in any slot, also data files on disc with volume numbers.
- A MOVE TO command.
- A SINGLE SHOT command to step through images line by line as a fault finding aid.
- Screen dump available to most matrix printers.

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Double hi-res graphics can make quite a show on the enhanced IIe

THERE were many reasons that helped me justify finding a new home for my five-year-old Apple II a few months ago, though it still worked as perfectly as on the day I bought it.

The one that finally led to this article was the ability of the enhanced Apple IIe to display graphics with twice the regular number of dots per line.

If you are the proud owner of an Apple IIe, or are thinking of buying one — good thinking there — read on . . .

A year ago, several months after the IIe was launched, one of its most interesting new features was still totally unsupported by even the most elementary form of demonstration software.

I knew that my new machine was capable of displaying double resolution graphics, but in the manual of its extended 80-column card — the one that also adds an extra 64k RAM to your machine — Apple simply invited me to either wait for commercial software to come on the market, or write my own.

I decided that write my own I would. Although my program was only ever intended to be a quick and dirty way to demonstrate the very existence of double hi-res, I now think that by virtue of its brevity and simplicity of use it should prove a useful addition to anyone's utility library.

As its name implies (see Listing I) my program will splice

together side by side whatever two pictures are stored in normal high resolution Pages 1 and 2.

The picture from Page 1 will occupy the left half of the double resolution screen while Page 2 will end up on the right.

Naturally, since only the horizontal size of the dots is

halved in order to double their number while the same number of vertical dots is retained, the pictures will look squeezed as their vertical to horizontal ratio changes (see pictures above).

However this will mainly be noticeable for pictures of an artistic nature and should not affect business graphics all that much — except perhaps for pie charts reminiscent of Easter eggs.

To put it straight to work first make sure you have the necessary hardware. You need an Apple IIe, an extended 80-column card installed in the auxiliary slot and a monochrome monitor capable of displaying 80 columns.

In order to get the double resolution display, the jumper provided with the card must be installed. (Ask your dealer if you're not too sure how.)

Ignore all the talk in the manual about revision A or B boards, since all European

Apple IIe's have a revision B board and can display double resolution graphics.

Now boot a DOS 3.3 disc, issue a CALL-151 to get into the monitor and enter the 148 bytes of object code from Listing II. To enter each line, type it exactly as shown except for the hyphen, which must be replaced with a

By RICCARDO ETTORE

colon. Don't forget to type a Return at the end of each line.

After typing the last line (0390: 68 AA 68 60), type 300LLLLL and check the disassembled listing against Listing III to make sure the program has been entered correctly.

Then save the program to disc by typing the following DOS command — it will work even if you're still in the monitor:

**BSAVESCREENSPLICER,
A\$300,L\$94**

At this point, you can try out the program with the hi-res pictures of your choice.

First load the two pictures into Pages 1 and 2 (BLOAD FIRSTPIC,A\$2000 and BLOAD SECONDPIC,A\$4000) and then CALL 768 from Basic or do a 300G if you're still in the monitor.

Almost immediately, you'll see the two pictures side by side on the same screen.

If something looks wrong, chances are you forgot to issue a PR#3 to activate the 80-column mode. But you can still do that now with no problem.

That's all there is to using ScreenSplicer.

If you already use the address space from \$300 to \$393 for some other purpose, you can relocate ScreenSplicer by simply BLOADing it with the A option, specifying the new starting address.

You then CALL it at the new address, for example BLOAD SCREENSPLICER,A\$6000 and CALL 24576.

ScreenSplicer contains no references to absolute addresses within itself so you can install it anywhere you have 148 spare bytes of RAM.

Of course you may be disappointed that it won't let you draw dots or lines directly on the double resolution screen, as in H PLOT 0,0 TO 559,191 to draw a line from the top left corner to the bottom right, but after all what do you expect to get with 148 bytes worth of code?

For those who are interested in how my program works, I've included the source code (Listing I) written under DOS Toolkit.

A big chunk of code (lines 44-67) is taken up by a classic public domain routine that calculates the base address — that is, the address of the first

GRAPHICS

byte on the left – for each line of the screen and passes it in zero page addresses.

This is repeated 192 times – the number of screen lines – in loop 1. For each line, loop 2 and

loop 3 send the odd bytes from the pictures in Pages 1 and 2 to main screen memory on the motherboard and the even bytes to auxiliary screen memory on the card.

The screen addresses for both main and auxiliary screen memory are the same (\$2000-3FFF), so two soft switches (\$C054 and \$C055) are used to direct the bytes to one or the

other bank.

For a detailed explanation of the workings of the double resolution screen you may want to refer to the Apple manual for the extended 80-column card.

Listing I: Source code. Splicing together two hi-res pages on the double resolution screen

```

SOURCE FILE: ScreenSplicer
0000:      1 ;# ScreenSplicer
0000:      2 ;#
0000:      3 ;# Written by R.Ettore
0000:      4 ;# Copyright      - ALL RIGHTS RESERVED
0000:      5 ;#
0000:      6 ;# This routine places the two regular high resolution pages side by side
0000:      7 ;# on the new double resolution screen of a //e (page one on the left
0000:      8 ;# page two on the right). A jumpered extended 80-column card must be
0000:      9 ;# in the auxiliary slot to display the double resolution screen.
0000:     10 ;#
0000:     11 ;# The routine can reside at any address in memory, since it contains
0000:     12 ;# no references to absolute addresses within itself.
0000:     13 ;# Suggested location is $300 (CALL 768 from BASIC).
0000:     14 ;
0000:     15 ;
0000:     16 ;
----- NEXT OBJECT FILE NAME IS ScreenSplicer.OBJO
0300:     17      ORG  $0300
0000:     18      OBJ  $0300
0300:     19 ;
C001:     20 STORE0 EQU $C001
C000:     21 STORE40 EQU $C000
C057:     22 HIRES  EQU $C057
C050:     23 GR    EQU $C050
C054:     24 MAIN  EQU $C054
C055:     25 AUX   EQU $C055
C05E:     26 DOUBLERES EQU $C05E
0300:     27 ;
0300:48     28      PHA          ;SAVE ALL REGISTERS
0301:8A     29      TXA
0302:48     30      PHA
0303:98     31      TYA
0304:48     32      PHA
0305:08     33      PHP
0306:      34 ;
0306:8D 50 C0 35      STA GR          ;TURN ON GRAPHICS
0309:8D 57 C0 36      STA HIRES       ;SELECT HIGH RESOLUTION
030C:8D 01 C0 37      STA STORE0     ;TURN ON 80 COLUMN MODE
030F:8D 5E C0 38      STA DOUBLERES  ;SELECT DOUBLE RESOLUTION GRAPHICS
0312:      39 ;
0312:A2 BF     40      LDX  ##BF      ;LOOP FOR 192 LINES
0314:8A     41 LOOP1 TXA
0315:      42 ;
0315:      43 ;CALCULATE BASE ADDRESS
0315:48     44      PHA
0316:29 C0     45      AND  ##C0
0318:85 02     46      STA  $02
031A:4A     47      LSR  A
031B:4A     48      LSR  A
031C:05 02     49      ORA  $02
031E:85 02     50      STA  $02
0320:68     51      PLA
0321:85 03     52      STA  $03
0323:0A     53      ASL  A
0324:0A     54      ASL  A
0325:0A     55      ASL  A
0326:26 03     56      ROL  $03
0328:0A     57      ASL  A
0329:26 03     58      ROL  $03
032B:0A     59      ASL  A
032C:66 02     60      ROR  $02
032E:A5 02     61      LDA  $02
0330:85 04     62      STA  $04
0332:A5 03     63      LDA  $03
0334:29 1F     64      AND  ##1F
0336:09 20     65      ORA  ##20
0338:85 03     66      STA  $03
033A:85 05     67      STA  $05
033C:      68 ;
033C:      69 ;HORIZONTAL LOOP
033C:      70 ;
033C:A0 00     71      LDY  ##00      ;INIT POINTER
033E:8D 54 C0 72 LOOP2 STA  MAIN
0341:B1 02     73      LDA  ($02),Y
0343:8D 55 C0 74      STA  AUX
0346:91 04     75      STA  ($04),Y
0348:E6 02     76      INC  $02
034A:8D 54 C0 77      STA  MAIN
034D:B1 02     78      LDA  ($02),Y
034F:91 04     79      STA  ($04),Y
0351:CB     80      INY
0352:C0 14     81      CPY  ##14
0354:D0 EB     82      BNE  LOOP2
0356:A5 02     83      LDA  $02
0358:38     84      SEC
0359:E9 14     85      SBC  ##14
035B:85 02     86      STA  $02
035D:A5 03     87      LDA  $03
035F:18     88      CLC
0360:69 20     89      ADC  ##20
0362:85 03     90      STA  $03
0364:A5 04     91      LDA  $04
0366:18     92      CLC
0367:69 14     93      ADC  ##14
0369:85 04     94      STA  $04
036B:A0 00     95      LDY  ##00
036D:8D 54 C0 96 LOOP3 STA  MAIN
0370:B1 02     97      LDA  ($02),Y
0372:8D 55 C0 98      STA  AUX
0375:91 04     99      STA  ($04),Y
0377:E6 02    100     INC  $02
0379:8D 54 C0 101     STA  MAIN
037C:B1 02    102     LDA  ($02),Y
037E:91 04    103     STA  ($04),Y
0380:CB    104     INY
0381:C0 14    105     CPY  ##14
0383:D0 EB    106     BNE  LOOP3
0385:CA    107     DEX
0386:E0 FF    108     CPX  ##FF
0388:D0 BA    109     BNE  LOOP1
038A:8D 00 C0 110     STA  STORE40
038D:28    111     PLP
038E:68    112     PLA
038F:AB    113     TAY
0390:68    114     PLA
0391:AA    115     TAX
0392:68    116     PLA
0393:60    117     RTS
0394:      118 ;
*** SUCCESSFUL ASSEMBLY: NO ERRORS
C055 AUX          C05E DOUBLERES      C050 GR          C057 HIRES
0314 LOOP1       033E LOOP2       036D LOOP3       C054 MAIN
C000 STORE40    C001 STORE0
0314 LOOP1       033E LOOP2       036D LOOP3       C000 STORE40
C001 STORE0     C050 GR          C05E DOUBLERES
C057 HIRES

```

Listing II: Object code

```

CALL-151
$300.393
0300- 48 BA 48 98 48 08 8D 50
0308- C0 8D 57 C0 8D 01 C0 8D
0310- 5E C0 A2 BF BA 48 29 C0
0318- 85 02 4A 4A 05 02 85 02
0320- 68 85 03 0A 0A 0A 26 03
0328- 0A 26 03 0A 66 02 A5 02
0330- 85 04 A5 03 29 1F 09 20
0338- 85 03 85 05 A0 00 8D 54
0340- C0 B1 02 8D 55 C0 91 04
0348- E6 02 8D 54 C0 B1 02 91
0350- 04 C8 C0 14 D0 EB A5 02
0358- 38 E9 14 85 02 A5 03 18
0360- 69 20 85 03 A5 04 18 69
0368- 14 85 04 A0 00 8D 54 C0
0370- B1 02 8D 55 C0 91 04 E6
0378- 02 8D 54 C0 B1 02 91 04
0380- C8 00 14 D0 EB CA E0 FF
0388- D0 BA 8D 00 C0 2B 68 AB
0390- 68 AA 68 60

```


*300LLLL			
0300-	48	PHA	
0301-	8A	TXA	
0302-	48	PHA	
0303-	98	TYA	
0304-	48	PHA	
0305-	08	PHP	
0306-	8D 50 C0	STA	£C050
0309-	8D 57 C0	STA	£C057
030C-	8D 01 C0	STA	£C001
030F-	8D 5E C0	STA	£C05E
0312-	A2 BF	LDX	##BF
0314-	8A	TXA	
0315-	48	PHA	
0316-	29 C0	AND	##C0
0318-	85 02	STA	£02
031A-	4A	LSR	
031B-	4A	LSR	
031C-	05 02	DRA	£02
031E-	85 02	STA	£02
0320-	68	PLA	
0321-	85 03	STA	£03
0323-	0A	ASL	
0324-	0A	ASL	
0325-	0A	ASL	
0326-	26 03	RDL	£03
0328-	0A	ASL	
0329-	26 03	RDL	£03
032B-	0A	ASL	
032C-	66 02	RDR	£02
032E-	A5 02	LDA	£02
0330-	B5 04	STA	£04
0332-	A5 03	LDA	£03
0334-	29 1F	AND	##1F
0336-	09 20	DRA	##20
0338-	85 03	STA	£03
033A-	85 05	STA	£05
033C-	A0 00	LDY	##00
033E-	8D 54 C0	STA	£C054
0341-	B1 02	LDA	(£02), Y
0343-	8D 55 C0	STA	£C055
0346-	91 04	STA	(£04), Y
0348-	E6 02	INC	£02
034A-	8D 54 C0	STA	£C054
034D-	B1 02	LDA	(£02), Y
034F-	91 04	STA	(£04), Y
0351-	08	INY	
0352-	C0 14	CPY	##14
0354-	D0 E8	BNE	£033E
0356-	A5 02	LDA	£02
0358-	38	SEC	
0359-	E9 14	SBC	##14
035B-	85 02	STA	£02
035D-	A5 03	LDA	£03
035F-	18	CLC	
0360-	69 20	ADC	##20
0362-	85 03	STA	£03
0364-	A5 04	LDA	£04
0366-	18	CLC	
0367-	69 14	ADC	##14
0369-	85 04	STA	£04
036B-	A0 00	LDY	##00
036D-	8D 54 C0	STA	£C054
0370-	B1 02	LDA	(£02), Y
0372-	8D 55 C0	STA	£C055
0375-	91 04	STA	(£04), Y
0377-	E6 02	INC	£02
0379-	8D 54 C0	STA	£C054
037C-	B1 02	LDA	(£02), Y
037E-	91 04	STA	(£04), Y
0380-	08	INY	
0381-	C0 14	CPY	##14
0383-	D0 E8	BNE	£036D
0385-	CA	DEX	
0386-	E0 FF	CPX	##FF
0388-	D0 8A	BNE	£0314
038A-	8D 00 C0	STA	£C000
038D-	28	PLP	
038E-	68	PLA	
038F-	AB	TAY	
0390-	68	PLA	
0391-	AA	TAX	
0392-	68	PLA	
0393-	60	RTS	
0394-	00	BRK	
0395-	00	BRK	
0396-	00	BRK	
0397-	00	BRK	
0398-	00	BRK	
0399-	00	BRK	
039A-	00	BRK	
039B-	00	BRK	
039C-	00	BRK	
039D-	00	BRK	
039E-	00	BRK	
039F-	00	BRK	

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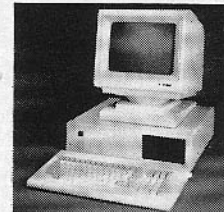
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ASK FOR DETAILS

THE invitation to gain super-res graphics with a horizontal resolution of 560 pixels (B.A. Baker, *Windfall* November, 1983, pages 38-39) seemed to be the answer to the proverbial maiden's prayer. But alas not all of the snags were explained.

We were warned against H PLOT a,b T O c,d so leaving the very attractive possibilities of plotting both single points and vertical lines, the latter being useful for histograms, dendrograms and the like and essential for graphs where the + symbol can make data points visible yet accurately represented.

Possibly the worst problem of super-res is that the extra resolution is only partially gained, for it is not possible to plot a,i,b using HCOLOR = 3 as well as the plotting order. Thus when graphing some data points may be lost.

But there is the more general problem that plotting in the same row of adjacent columns nearly always yields three pixels instead of the two intended.

This should be expected, for we are all familiar with solid white blocks in HGR and yet the concept of super-resolution would lead us to expect stripes with alternate pixels illuminated.

Program 1 should convince sceptics. Note that successive lines are displaced five rows downwards to make the plotting sequence obvious.

There are eight data pairs to demonstrate all combinations of plotting in adjacent columns.

When this program is run the sequence of pixel illumination shown in Figure 1 occurs on rows common to both columns, for each data pair in turn.

Thus intermediate pixels are undesirably illuminated in examples 1, 2, 4, 5, 6 and 8, whereas the third and seventh examples demonstrate that attempts to plot adjacent pixels result in addition of a pixel in the first column plotted.

Examples 2 and 6 reveal that the first illuminated pixel can appear to move. Thus graphing real data may produce misleading representation of symbols and even mislocation.

The individual characteristics of different monitors were not discussed by B.A. Baker so it is appropriate to refer readers to the article by Dr G.A. Manson in

Windfall, July 1982, Page 63. Among the information given by that writer is the possibility that half intensity dots (and hence lines too) appear when HCOLOR = 7 and the horizontal coordinate (X) is such that X + 1 = 7 * N, and N is an integer. Thus for most monitors this problem occurs when X = 6, 13, 20, 27 etc.

Another problem associated with HCOLOR = 7 occurs on my

monitor when the first and last vertical lines are plotted (X = 0 and 279) as when drawing a frame for a graph.

The instruction H PLOT 279, 0 TO 279, 191 yields a line of half intensity (viz. X + 1 = 280 = 7 * 40) and can affect points plotted in the first line.

Thus if HCOLOR = 7 when executing H PLOT 0, 0 TO 0, 191 then from 0, 0 TO 0,63 the line is one pixel wide but

thereafter the line becomes two pixels wide with the unwanted points appearing to the left.

This occurs irrespective of the order of plotting the lines and occurs even if HCOLOR = 3

Super-res graphics can double your dots

APPLETALKERS are an important part of the graphics revolution. They are the only way to get the most out of your Apple II. They are the only way to get the most out of your Apple II. They are the only way to get the most out of your Apple II.

The Apple's standard high-resolution graphics mode can display data in a matrix 280 dots wide and 192 dots high or so. The Apple II Reference Manual states: This mode (resolution mode) with 280 x 192 dots wide and only one of two extra bits of shading. It is possible to increase this resolution to 560 dots wide by 192 dots high.

There is a price to pay, on the "other side" of the coin, for this extra resolution. It is possible to increase the resolution to 560 dots wide by 192 dots high. There is a price to pay, on the "other side" of the coin, for this extra resolution. It is possible to increase the resolution to 560 dots wide by 192 dots high.

The maiden's prayer wasn't entirely answered...

Example	1	2	3	4
COLUMN	50 51	60 61	70 71	80 81
PIXEL	L R . L R	L R . L R	L R . L R	L R . L R
FIRST	x	x	x	x
SECOND	x	x	x	x
UNWANTED	x	x	x	x
MOVE		...		
Result	x x x	x x x	x x x	x x x

Example	5	6	7	8
COLUMN	100 101	110 111	120 121	130 131
PIXEL	L R . L R	L R . L R	L R . L R	L R . L R
FIRST	x	x	x	x
SECOND	x	x	x	x
UNWANTED	x	x	x	x
MOVE		x...		
Result	x x x	x x x	x x x	x x x

Figure 1: Sequence of pixel illumination after running the program

```

10 RESTORE
20 HGR
30 HOME
40 VTAB 21
50 READ X
60 GOSUB 100
70 GOTO 30
100 REM SUB-ROUTINE
110 GET A$
120 PRINT "X = ";X
130 C = C + 5
140 HCOLOR= 7
150 IF X - INT (X) < 0.5
    THEN HCOLOR= 3
160 H PLOT X,0 + C TO X,100
    + C
170 RETURN
200 REM DATA
210 DATA 50.1, 51.1, 60.1,
    61.6, 70.7, 71.2, 80.8,
    81.7
220 REM now the plotting
    will be towards the left
230 DATA 101.1, 100.1,
    111.6, 110.1, 121.2,
    120.7, 131.8, 130.9

```

Program 1

GRAPHICS

for plotting in column 279.
Hence the program lines:

```
10 HGR: HCOLOR = 7: HPLOT
  5,64: HCOLOR = 3 (OR 7):
  HPLOT 279,0
```

and:

```
10 HGR: HCOLOR = 3 (OR 7):
  HPLOT 279,0: HCOLOR =
  7:HPLOT 5,64
```

are equivalent, both yielding an unwanted point at 0, 64 in the left hand pixel.

Note that this phenomenon occurs when points are plotted in columns 0 to 6 and rows 64 plus.

Stated generally, points plotted at 279,a and b,(64+a) where a = 0 to 95 for HGR (0 to 127 for HGR2) and b = 0 to 6, yield an unwanted point at 0,(64+a). Clearly it is wise to avoid plotting in the last vertical column.

However, this is a special case of a more general problem for which Dr Manson's rule is

```
10 HOME
20 VTAB 21
30 INPUT "ORIGINAL LINE
  POSITION = ";L
40 HGR
50 HCOLOR= 3
60 HPLOT L,0 TO L,100
70 INPUT "SECOND LINE
  POSITION = ";K
80 HCOLOR= 7
90 HPLOT K,50 TO K,60
100 GET AS
110 GOTO 40
```

Program II

the key to understanding some aspects.

Program II has been devised to demonstrate the phenomenon of line displacement.

First run the program and set the original line position to 24 and note that when the second line is plotted at 23 or 25 the original line is enlarged in width where overlap occurs — this follows from the demonstration given by Program I.

However the new observation is that when the second line is plotted at 25 (and also at 21, 22, 26 or 27) the original line is offset to the right in the overlap region. Plotting at positions <21 and >27 does not affect the original line.

It should have been noticed that the second line is of half intensity when plotted at positions 20 and 27 as expected from Manson's rule. The effect of exchanging the colours is to cause displacement of the original line to the left when the second is plotted at 21, 22, 23, 26 and 27.

Secondly re-run Program II and set the original line position to a Manson number, say 20.

When the second line is at positions 14, 15, 16, 17 or 18 the original line becomes half intensity in the overlap region, and for second line positions 22, 23, 24, 25, 26 and 27 the original line has double width with the increase to the right in the overlap region.

Exchanging the colours

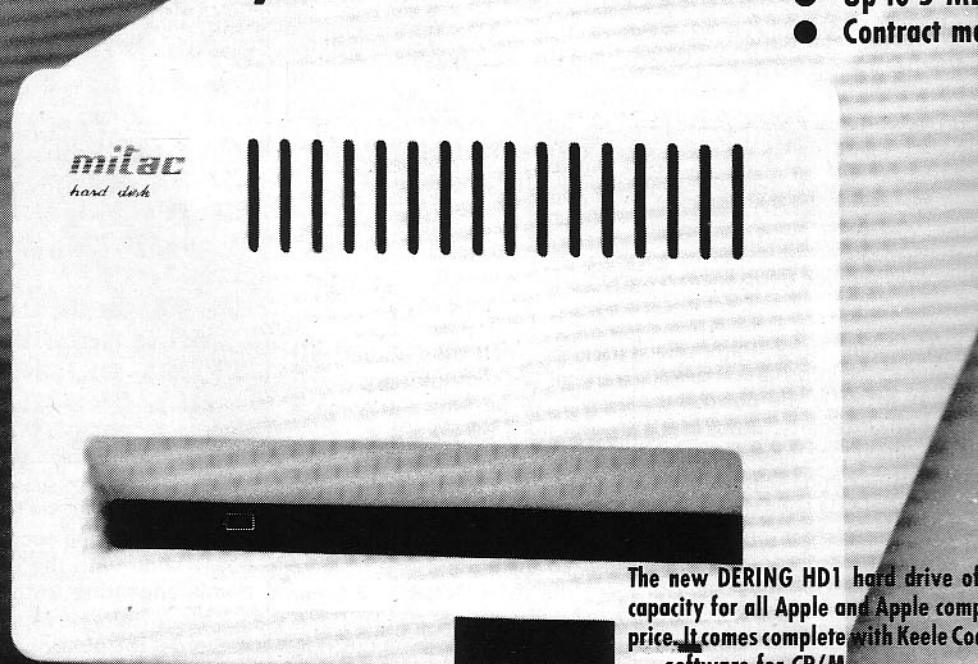
makes the original line appear at half intensity and to become full intensity in overlap regions when the second line is at positions 14, 15, 16, 17 or 18.

If both lines are plotted in HCOLOR = 7 and the first is at a Manson position, 20, then it becomes full intensity in overlap positions when the second line is to the right in any of the next seven columns, for example 21 to 27.

Super-res graphics brings plotting errors:

- For points in the same column and row, such as 22.2 and 22.6.
- For points in the same row and adjacent columns, such as 22.2 and 23.2.
- For original points when others are plotted in the same row and nearby columns of value > the next lowest Manson number and <= the next highest Manson number.
- For points in column 0 if appropriate points in column 279 are occupied, such as for 0,64 and 279,0.

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AS a first-time user becomes familiar with the operation of his Lisa, the ability to control the size of the image on the screen and to select from a large range of type sizes on the printer can hardly fail to produce a forceful impact.

It adds a new dimension to everyone's communications — but especially to those disadvantaged by suffering from a visual handicap.

To suggest that Lisa is better than its predecessors in this respect might seem a little difficult to grasp at first, as its built-in monitor screen is smaller than the one used in previous Apples.

However any apparent loss of visual quality from this is overcome to a great extent by far better resolution — 364 lines on a screen measuring 8.5in x 6in of active area.

This needs to be matched if a parallel monitor is used or the attempt at extra enlargement is not going to meet with much success.

If a monitor other than one specifically designed for the purpose is used care is required in electronic matching. It requires its own electrical supply and amplifier system. Simple daisy chaining with the Lisa VDU would cause serious overloading, with probable damage.

Many people not having a large sized monitor would nevertheless achieve better functional results if they took full advantage of the standard equipment's capability.

They often fail to realise the hidden potential of the facilities such as grouping, shrink and grow, cut and paste and the full range of type selection menu.

In the North Western Regional Health Authority Emergency Planning Department all normal typing such as memoranda, letters and reports are done by LisaWrite almost as a matter of routine.

Appropriate illustrations in the form of tables of data, charts, graphs or graphics are simply transferred and incorporated by a cut and paste operation.

**Dr Charles Fairfax is a consultant in community medicine in the North Western Regional Health Authority.*

Lisa aid for the visually handicapped

By CHARLES FAIRFAX

This is very easy to do since Lisa integrated software is not a mere loose collection of systems but a tightly knit whole which lends itself to be used in this way.

Recently I wrote to a colleague who was temporarily off work recovering from an eye operation for a detached retina.

To force him to read the standard size of typescript would have imposed needless eyestrain and have been most inconsiderate.

This was avoided very simply by the selection from the type style menu bar of:

1/4" modern bold

He was both delighted and highly amused. His amusement was enhanced by a not-too-serious personalised get well card synthesised on LisaDraw.

The size we used was adequate but we could have chosen:

1/3" MODERN

or

1/3" CLASSIC BOLD

We thought that might be overdoing it.

Once the general idea had dawned we tried it out, experimenting on all sorts of

volunteers, both fully sighted and visually handicapped.

One such willing victim who was volunteered into being our guinea pig was suffering from a condition known as retinitis pigmentosa.

This is a defect of the retina that causes a seriously disabling loss of visual acuity with the classical symptom of tubular vision.

Although the peripheral visual fields may be almost totally destroyed a small area of central vision is often less affected, and with the aid of a magnifier many are able to manage to read, albeit not without some considerable effort.

In our volunteer's case both the enlarged screen image and the printout were of very obvious benefit.

We also tried him on graphics using the growth facility. Building up large graphics from abutting sheets, coupled with the use of heavy lines and shades, was an even

greater help.

They did not just make things come to life, they made images emerge for the first time out of what previously had been com-

plete invisibility.

A first reaction was that with the larger size of image the screen might too easily overflow. This is the reaction only of those with physiologically normal vision.

For the visually handicapped the slight extra effort required is insignificant compared to enabling someone to see! It is certainly much less than the usual struggle.

Our experience in practice is that it is amazing to what extent even a modest enlargement can help persons who suffer from severe visual loss.

In some instances a sighted person can operate the screen in normal sized mode on behalf of a less able companion and then edit to the enlarged mode for printing.

The landscape form of page layout enables use to be made of what would otherwise be empty margin, and so an effective longer length of line can be obtained. Using a continuous roll of pin feed computer paper 8.5in wide perforated with 11in pages, the result is an 11in wide sheet as long as one chooses.

Too much must not be expected of landscape selection — one can very easily achieve only a wider surround. One must be prepared to move from LisaWrite to LisaDraw paper involving grouping, cut, paste and grow, and a choice of larger typestyle in order to enlarge effectively.

Although quite easy to do, perhaps this is a little tedious for ordinary general use. It is a method really only applicable if an illustrated output on LisaDraw is going to be used anyway.

When put to full use it is of immense value, since sheets that match edge to edge can be produced to join together to give a wall sized document up to 96in x 48in.

At first we were tempted to try to select the size of print on the computer according to measurements of visual acuity in terms of Snellen test types used by opticians for sight testing.

Seen in retrospect this was altogether too academic and fussy. All that is required is to try out the finished result on the person who has to read it and

alter the size accordingly only if required.

After all, Lisa operates so quickly that little is lost by trying a few alternatives.

Changing the type size is simply carried out by selecting the text to be altered, marking it with the mouse, pulling down the type style menu box and choosing the desired size and character. We found a $\frac{1}{4}$ in bold type was generally the most useful.

The alternative is to set aside on the clipboard the type style to be used and then to edit the text to "same as clipboard".

This is handy when two versions of the print are required at the same time, one for the normally sighted and the other for the visually handicapped.

A professional colleague whose job entailed sitting in meetings of a public authority reading from papers and taking minutes pointed out that he had to manage with a $\times 10$ hand magnifier supplied by the RNIB. This he found quite a struggle compared with managing with Lisa-prepared documents.

This factor in certain circumstances could make all the difference in being able to hold down a job or not. Similar situations must be occurring all the time in a wide range of occupations.

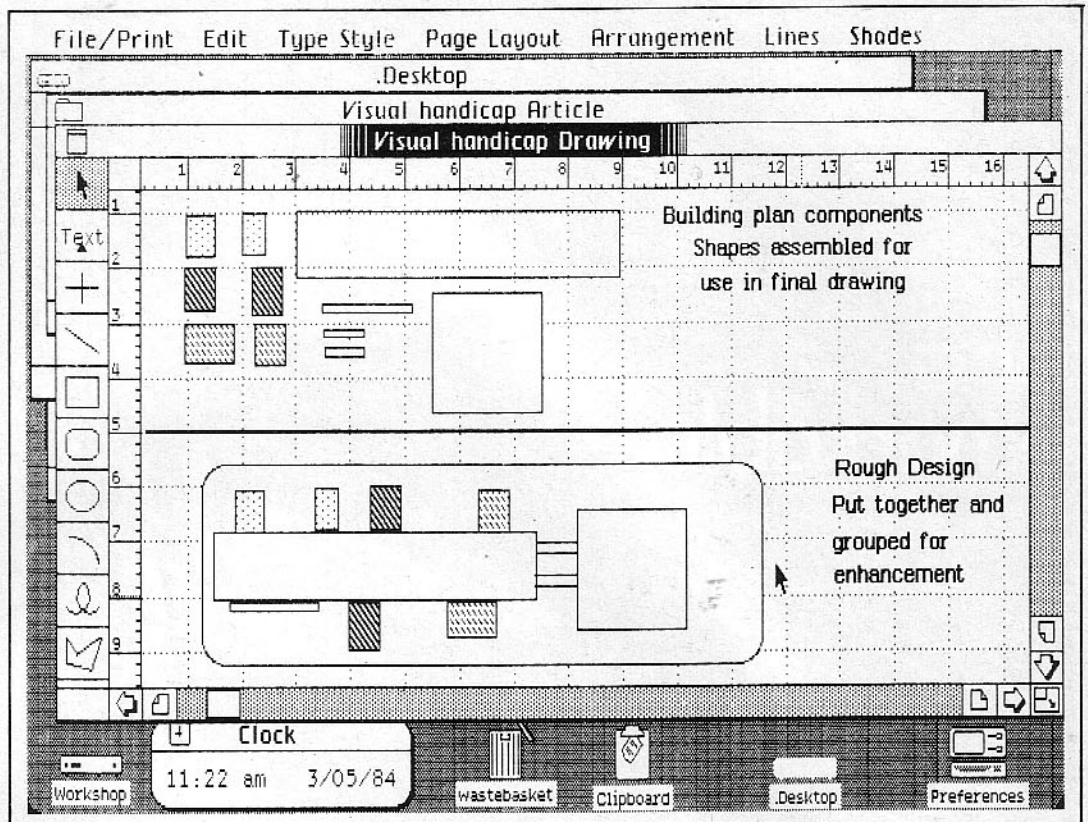
The ability to discriminate images on the screen and in print does not depend solely on size and line resolution but also on contrast and overall lighting levels, both of the object viewed and the background.

The screen intensity and contrast can be adjusted to the room lighting using the preference settings. Glare can lower visual acuity to a very considerable extent and the use of the glare filter helps slightly.

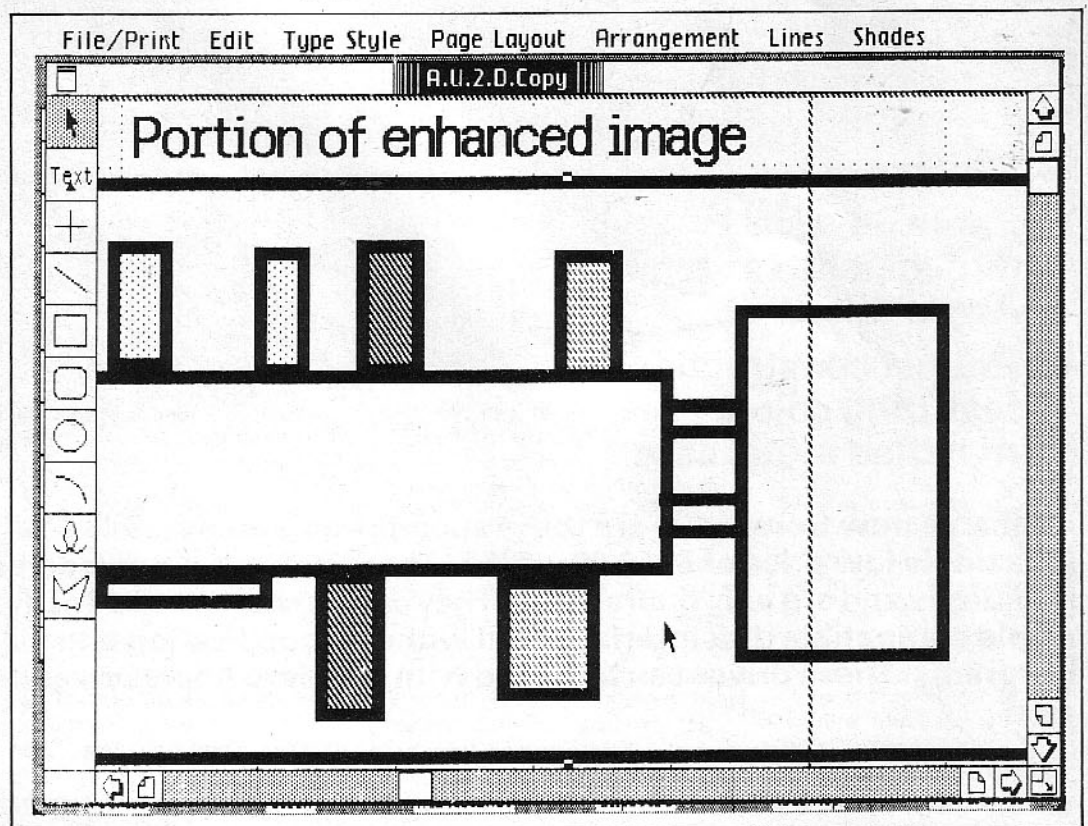
Attention needs to be given to the siting of the apparatus in relation to the room lighting. A little trouble taken in these matters is of benefit to those with good sight.

It is absolutely invaluable for those who are only just able to see.

The attention of Apple has been drawn to this subject. The hint has been dropped that they should consider updating their software to include an alternative set of icons and menu displays made a little larger for



● Lisa is adept at enlarging detail



the visually handicapped.

Although the observations were made using Apple equipment, the same fundamental principles apply to all micros

with integrated software that has group, shrink and grow and multiple-type style selection.

It is hoped that other manufacturers, perhaps even

including those with a less versatile range to offer, will consider this.

Some not so fortunate as ourselves may so be helped.

ONE of the most important features of Pascal is the ability to define procedures, a procedure being a subprogram, a section designed to do a particular part of the task of the whole.

An example, again from the payroll program, would be a procedure to add a new employee. Every time a new employee must be added to the payroll, this procedure is used by the program. This use of a procedure is known as a call or invocation.

In this article I will use a lot of graphic examples, based around designs made from squares. Here is a simple piece of Pascal to draw a square, with sides 20 turtle steps long:

```
FOR I:= 1 TO 4 DO
BEGIN
  MOVE(20);
  TURN(90)
END;
```

This draws a square all right, with the bottom left corner wherever the turtle happens to start, in whatever colour the pen happens to have. We can use this as a building block, to draw four squares:

```
INITTURTLE;
MOVETO(40,50);
PENCOLOR(WHITE);
FOR I:= 1 TO 4 DO
  BEGIN
    MOVE(20);
    TURN(90)
  END;
PENCOLOR(NONE);
MOVETO(40,100);
PENCOLOR(WHITE);
FOR I:= 1 TO 4 DO
  BEGIN
    MOVE(20);
    TURN(90)
  END;
PENCOLOR(NONE);
MOVETO(239,50);
PENCOLOR(WHITE);
FOR I:= 1 TO 4 DO
  BEGIN
    MOVE(20);
    TURN(90)
  END;
PENCOLOR(NONE);
MOVETO(239,100);
PENCOLOR(WHITE);
```

An invocation of procedures isn't as high church as it sounds...

```
FOR I:= 1 TO 4 DO
BEGIN
  MOVE(20);
  TURN(90)
END;
```

Good grief! All that for four small squares. I have deliberately written all this out in full, to make the point that the use of procedures will make a difference in both readability and length.

Fortunately Pascal allows us to group a block of statements together, and give them a name. A block like this is called a procedure.

This use of a procedure is tantamount to adding a command to Pascal just for the one program. In this case, the block of statements separated out will be:

```
PENCOLOR(WHITE);
FOR I:= 1 TO 4 DO
  BEGIN
    MOVE(20);
    TURN(90)
  END;
```

Let's call the procedure SQUARE20, to remind us of what it does. To make this grouping into a procedure we must:

- Surround it with a BEGIN END pair.
- Give it a name, with the word PROCEDURE:

```
PROCEDURE SQUARE20;
BEGIN
  PENCOLOR(WHITE);
  FOR I:= 1 TO 4 DO
    BEGIN
      MOVE(20);
      TURN(90)
    END;
END;
```

The procedure is used like this:

```
INITTURTLE;
MOVETO(40,50);
SQUARE20;
PENCOLOR(NONE);
MOVETO(40,100);
SQUARE20;
```

and so on. It might have saved a little more space to include the PENCOLOR(NONE) in the procedure, but perhaps at the cost of readability.

But where do we let the computer know about the procedure? After all, the command SQUARE20 isn't part of its repertoire. We must declare the procedure, just as we must declare variables to introduce them.

Procedure declarations appear just after variable declarations, before the program begins. Here is a complete program, using the procedure SQUARE20:

Try it to see how a more com-

```
PROGRAM DEMO;
USES TURTLEGRAPHICS;
VAR I,J:INTEGER;
PROCEDURE SQUARE20;
  BEGIN
    PENCOLOR(WHITE);
    FOR I:= 1 TO 4 DO
      BEGIN
        MOVE(20);
        TURN(90)
      END
    END (* SQUARE20 *);
BEGIN
  INITTURTLE;
  FOR J := 1 TO 8 DO
    BEGIN
      SQUARE20;
      TURN(45)
    END
  END (* PROGRAM *).
```

plex pattern and program can be made up from a building block such as the square-drawing procedure.

A program using loops and procedures tends to have a lot of ENDS. Many programmers use a comment, like the two above, to identify the main ENDS.

Be careful not to lose the semicolons or full stops which go with the END.

This use of a procedure is pretty much like the use of GOSUB in Basic - it is a way of using the same piece of code more than once.

But this is only a beginning. The procedure to draw a square can be made more versatile by letting the size of the square change.

The side length can be given to the procedure as an input. The only thing that requires a little thought is whether the input ("parameter") to the procedure will be a real, an integer, a character or whatever.

Clearly in this case the side of a square must be an integer. Here's an amended version, with the variable SIDE being input:

```
PROCEDURE SQUARE(SIDE:
INTEGER); BEGIN
  PENCOLOR(WHITE);
```

Part VII of our teach-yourself series by GORDON FINDLAY

PASCAL TUTORIAL

```

FOR I:= 1 TO 4 DO
  BEGIN
    MOVE(SIDE);
    TURN(90)
  END
END (* SQUARE *);

```

The procedure heading now contains a declaration clause — the variable SIDE is “sort of” declared as an integer. “Sort of” because the variable SIDE never actually exists!

To see why, look at what happens in two invocations of the procedure:

(1) SQUARE(20);

The value 20 is passed to the procedure, so the line MOVE(SIDE) effectively becomes MOVE(20). No variable is involved at all.

(2) SQUARE(I);

The variable I must be an integer (the procedure was told to expect an integer) and in fact the procedure is passed the value of I. If I had the value 20 this is identical to the first case.

In neither case is a variable called SIDE ever created. “Side” is rather like a placeholder, it keeps the place for some integer value to claim.

Procedures can have any number of these “parameters” or “arguments”. The obvious place to extend this procedure is to allow the program to “tell” the procedure where to draw the square.

This means passing two more parameters, the X and Y coordinates. Notice the punctuation carefully:

```

PROGRAM SQUAREPICTURES;
USES TURTLEGRAPHICS,APPLESTUFF;
VAR I,J:INTEGER;
PROCEDURE SQUAREAT(X,Y,SIDE:INTEGER);
  BEGIN
    PENCOLOR(NONE);
    MOVETO(X,Y);
    PENCOLOR(WHITE);
    FOR I:= 1 TO 4 DO
      BEGIN
        MOVE(SIDE);
        TURN(90)
      END
    END (* SQUAREAT *);
  BEGIN (* MAIN PART OF PROGRAM *)
    INITTURTLE;
    FOR J := 1 TO 20 DO SQUAREAT(0,0,10*J);
    REPEAT UNTIL KEYPRESS
  END.

```

This program illustrates several things — a procedure can have an expression, such as “10*J” passed to it, and the use of the unit APPLESTUFF.

This unit adds instructions to the Pascal language, just as turtlegraphics does. The reason it is required here is that I have used “KEYPRESS”. This is a test, which is *true* if a key is being pressed, and is *false* otherwise. Here it is used to keep the graphics display on the screen for us to look at.

The REPEAT UNTIL KEYPRESS has the effect of repeatedly doing nothing at all until a key is pressed. But remember, put APPLESTUFF in the USES list.

In ‘SQUAREPICTURES’ an integer variable I is declared so that it can be used in the procedure to count the number of sides as the square is drawn.

This variable is only used inside the procedure — never in the main program. So the main program never really needs to “know about” I. It is permissible, even desirable, to declare I inside the procedure itself.

The listing above right shows how the program would look.

This seemingly minor change has one important effect — it stops the main program from corrupting the variables used by a procedure, and vice versa. In other terms, it localises variables to where they are used, preventing accidental interference.

It is good practice to make as many variables as possible local to the procedures they are re-

quired in.

It is excellent practice to have no global variables at all — but this is rarely possible in practice. (A global variable, one declared in the main program, is accessible to, and can be changed by, the main program and any procedure).

One word of warning — when re-using a procedure the variables declared in it all get reset, they don’t carry their values forward each time.

Local variables in procedures can have the same name if you like — you can use as many variables called I as required provided they are in different procedures.

A detailed discussion of the scope of a variable will need to wait for another time.

Under normal circumstances a procedure may not alter the value of its inputs, or

parameters. It would be quite wrong for the procedure SQUAREAT to try to change the value of SIDE, by something like SIDE := SIDE + 1.

But if a procedure has to send information back to the main program it can do so through a VAR parameter in a procedure heading like this:

```

PROCEDURE DUMMY(X,Y:REAL;
Z:INTEGER; VAR W:BOOLEAN);

```

The procedure cannot alter X, Y or Z, but can alter the value of W. Indeed, W may not be given a value at all until procedure DUMMY takes over.

One possible use of this, in terms of turtlegraphics, is to have a procedure return a Boolean variable, saying whether or not the turtle has moved off the screen (below).

```

PROCEDURE DRAWTHINGS(X,Y,SIZE:INTEGER; VAR OFFSCREEN:BOOLEAN);
  VAR :::::
  BEGIN
    (* body of procedure *)
    OFFSCREEN := (TURTLEX>279) OR (TURTLEX<0) OR (TURTLEY>191) OR
      (TURTLEY < 0);
  END (*DRAWTHINGS *);

```



Roll up, Roll up for this DIY teaser!

Adapt G. ROGER GILBERTSON's quiz game to suit your own needs

I LIKE multi-purpose programs and demonstrating that computers can be fun. This program achieves both by enabling you to construct your own quiz very quickly.

It also lets others answer it with nothing more frightening than a single push-button.

The General Purpose Quiz was first written for a county show but proved so popular that it has since been used on numerous occasions at a variety of smaller events.

To adapt it for your own use, you need only change 24 data statements in the final module of the program. If necessary, the Apple can be hidden from view and the program left running all day with only a monitor and a games paddle visible.

However, to cater for the handicapped or the heavy handed, you may prefer to wire a large push button across the contacts of the paddle button and use that instead.

As any showman knows, you must first attract an audience.

The General Purpose Quiz flashes an "attractor" pattern on the screen, which will look all the better if you have a colour card and monitor.

In large letters it then announces a quiz and invites the curious to take part.

If no one responds, or the quiz is later abandoned part way through, the program automatically returns to the attractor and tries again.

Having attracted a contestant, 20 questions are offered in turn, each having four possible answers.

Players are asked to press the button when the answer thought to be correct is flashing. They are then told the correct

answer and, if appropriate, awarded five points.

Having answered all the questions, their total score and the best score so far are shown with an appropriate comment and the quiz begins again.

To simplify matters even further, contestants are reminded when to press the button and are also asked to release it if their fingers stick.

In some circumstances you may prefer not to display the correct answer immediately a question has been answered. In this case insert:

8465 GOTO 8550

If, in addition, you do not wish to indicate whether or not

the answer was correct, then also insert:

8555 GOTO 8590

Note that it would be possible to jump direct from 8465 to 8700. However, in this case there would be no check on whether the quiz had been abandoned until all the questions had been displayed.

To return, like the quiz, to where I began, this program can be fun and ranks in versatility with my favourite multi-purpose programs - a word-processor, a spreadsheet and a relational database.

If ever I were shipwrecked, these would certainly be included on my Desert Island Disc!

Quiz listing

10 TEXT : SPEED= 255: HOME : NORMAL	170 REM ** ENSURE PUSH-BUTTON IS RELEASED **	QUESTIONS **	1080 PLOT X,Y
20 REM ** GENERAL PURPOSE QUIZ **	180 GOSUB 10020	340 GOSUB 8020	1090 FOR TC = 1 TO 19
30 REM ** COPYRIGHT G R GILBERTSON **	190 REM ** INVITE PARTICIPATION **	350 REM ** DISPLAY SCORE AND COMMENTS **	1100 I = I + 1
40 REM ** DIM QUESTIONS ARRAY Q\$ AND ANSWERS ARRAY A\$ **	200 GOSUB 5020	360 GOSUB 9020	1110 Z = Z + 1
50 DIM Q\$(20,5)	210 REM ** LOOK FOR RESPONSE **	370 REM ** IF BUTTON PRESSED THEN PLAY AGAIN. OTHERWISE DISPLAY ATTRACTOR **	1120 IF Z = 16 THEN Z = 0
60 DIM A\$(21)	220 GOSUB 6020	380 FOR TD = 1 TO 1000	1130 COLOR= Z
70 REM ** DISPLAY ATTRACTOR **	230 ON TI GOTO 80,250	390 IF PEEK (- 16287) > 127 THEN TD = 1000: GOTO 120	1140 HLINE Y - 1, Y + 1 AT X - 1
80 GOSUB 1020	240 REM ** ENSURE PUSH-BUTTON IS RELEASED **	400 NEXT TD	1150 VLINE X - 1, X + 1 AT Y + 1
90 REM ** DISPLAY 'QUIZ' IN HIRES **	250 GOSUB 10020	410 HOME	1160 HLINE Y + 1, Y - 1 AT X + 1
100 GOSUB 2020	260 REM ** PROVIDE INSTRUCTIONS **	420 GOTO 80	1170 VLINE X + 1, X - 1 AT Y - 1
110 REM ** ZERO DATA POINTERS **	270 GOSUB 7020	1000 REM ** SUBROUTINE FROM MAINLINE **	1180 NEXT TC
120 RESTORE	280 REM ** LOOK FOR RESPONSE **	1010 REM ** DISPLAY ATTRACTOR **	1190 COLOR= 0
130 REM ** SET SCORE TO ZERO **	290 GOSUB 6020	1020 BR	1200 FOR TC = 1 TO 19
140 SC = 0	300 ON TI GOTO 80,320	1030 X = 20	1210 VLINE X + 1, X - 1 AT Y - 1
150 REM ** READ TITLE, CORRECT ANSWERS AND SUBJECT INTO A\$ ARRAY *	310 REM ** ENSURE PUSH-BUTTON IS RELEASED **	1040 Y = 20	1220 HLINE Y + 1, Y - 1 AT X + 1
160 GOSUB 4020	320 GOSUB 10020	1050 FOR TI = 1 TO 3	1230 VLINE X - 1, X + 1 AT Y + 1
	330 REM ** PROVIDE	1060 Z = INT (RND (1) * 15) + 1	1240 HLINE Y - 1, Y + 1 AT X - 1
		1070 COLOR= Z	1250 I = I - 1

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1260 NEXT TC
1270 PLOT X,Y
1280 NEXT TI
1290 TEXT
1300 HOME
1310 RETURN
2000 REM ** SUBROUTINE
      FROM MAINLINE **
2010 REM ** DISPLAY 'QUIZ'
      IN HIRES **
2020 HGR2
2030 FOR TI = 1 TO 3
2040 HCOLOR= 3
2050 GOSUB 3020
2060 FOR TC = 1 TO 1000
2070 NEXT TC
2080 HCOLOR= 0
2090 GOSUB 3020
2100 NEXT TI
2110 TEXT
2120 HOME
2130 RETURN
3000 REM ** SUBROUTINE
      FROM PREVIOUS MODULE **
3010 REM ** DRAW 'Q' IN
      HIRES **
3020 HPLLOT 20,25 TO 80,25
      TO 80,140 TO 20,140 TO
      20,25
3030 HPLLOT 31,36 TO 69,36
      TO 69,129 TO 31,129 TO
      31,36
3040 HPLLOT 45,129 TO 45,118
      TO 56,118 TO 56,129
3050 HPLLOT 45,140 TO 45,159
      TO 67,159 TO 67,148 TO
      56,148 TO 56,140
3060 REM ** DRAW 'U' IN
      HIRES **
3070 HPLLOT 102,25 TO 113,25
      TO 113,129 TO 135,129 TO
      135,25 TO 146,25 TO
      146,140 TO 102,140 TO
      102,25
3080 REM ** DRAW 'I' IN
      HIRES **
3090 HPLLOT 178,25 TO 189,25
      TO 189,140 TO 178,140 TO
      178,25
3100 REM ** DRAW 'Z' IN
      HIRES **
3110 HPLLOT 211,25 TO 264,25
      TO 264,36 TO 222,129 TO
      266,129 TO 266,140 TO
      211,140 TO 211,129 TO
      255,36 TO 211,36 TO
      211,25
3120 RETURN
4000 REM ** SUBROUTINE
      FROM MAINLINE **
4010 REM ** READ TITLE,
      CORRECT ANSWERS AND
      SUBJECT INTO A$ ARRAY **
4020 FOR TC = 0 TO 21
4030 READ A$(TC)
4040 NEXT TC
4050 RETURN
5000 REM ** SUBROUTINE
      FROM MAINLINE **
5010 REM ** INVITE
      PARTICIPATION **
5020 HTAB ((40 - LEN
      (A$(0))) / 2)
5030 FOR TC = 1 TO LEN
      (A$(0)) + 4
5040 PRINT "£";
5050 NEXT TC
5060 PRINT
5070 FOR TC = 1 TO 3
5080 HTAB ((40 - LEN
      (A$(0))) / 2)
5090 PRINT "£";
5100 PRINT SPC( LEN
      (A$(0)) + 2);
5110 PRINT "£"
5120 NEXT TC
5130 HTAB ((40 - LEN
      (A$(0))) / 2)
5140 FOR TC = 1 TO LEN
      (A$(0)) + 4
5150 PRINT "£";
5160 NEXT TC
5170 VTAB 3
5180 HTAB ((40 - LEN
      (A$(0))) / 2) + 2
5190 PRINT A$(0)
5200 VTAB 8
5210 PRINT "THIS QUIZ
      CONSISTS OF 20 QUESTIONS
      ABOUT"
5220 INVERSE
5230 PRINT
5240 HTAB ((40 - LEN
      (A$(21))) / 2) + 2
5250 PRINT A$(21)
5260 NORMAL
5270 VTAB 14
5280 PRINT "IF YOU WOULD
      LIKE TO PLAY THEN:"
5290 FLASH
5300 HTAB 12
5310 VTAB 17
5320 PRINT "PRESS THE
      BUTTON NOW"
5330 NORMAL
5340 VTAB 20
5350 PRINT "OTHERWISE, I'LL
      WAIT FOR SOMEONE ELSE."
5360 RETURN
6000 REM ** SUBROUTINE
      FROM MAINLINE **
6010 REM ** LOOK FOR
      RESPONSE **
6020 TI = 1
6030 FOR TC = 1 TO 800
6040 IF PEEK ( - 16287) >
      127 THEN TC = 800:TI = 2
6050 NEXT TC
6060 HOME
6070 RETURN
7000 REM ** SUBROUTINE
      FROM MAINLINE **
7010 REM ** PROVIDE
      INSTRUCTIONS **
7020 PRINT "FOUR POSSIBLE
      ANSWERS WILL BE SHOWN
      FOR" : PRINT
7040 PRINT "EACH QUESTION."
      : PRINT
7060 PRINT "WHEN THE ANSWER
      YOU THINK IS CORRECT IS"
      : PRINT
7080 PRINT "FLASHING,
      THEN:" : PRINT
7100 HTAB 12
7110 FLASH
7120 PRINT "PRESS THE
      BUTTON"
7130 NORMAL
7140 VTAB 11
7150 PRINT "PUSH THE BUTTON
      FOR THE FIRST QUESTION."
7160 RETURN
8000 REM ** SUBROUTINE
      FROM MAINLINE **
8010 REM ** PROVIDE
      QUESTIONS **
8020 FOR TI = 1 TO 20
8030 Z = 3
8040 FOR TC = 0 TO 4
8050 READ Q$(TI,TC)
8060 VTAB Z
8070 REM ** INDENT ANSWERS
      **
8080 IF (TC) THEN HTAB
      ((40 - LEN (Q$(TI,TC)))
      / 2) + 1
8090 PRINT Q$(TI,TC); PRINT
8110 Z = Z + 4
8120 NEXT TC
8130 REM ** PROVIDE
      REMINDER **
8140 VTAB 21
8150 PRINT "PRESS BUTTON
      WHEN YOUR CHOICE
      FLASHES." : PRINT
8170 PRINT "YOU HAVE THREE
      OPPORTUNITIES TO CHOOSE."
8180 REM ** DELAY BEFORE
      FLASHING ANSWERS **
8190 FOR TD = 1 TO 1500
8200 NEXT TD
8210 REM ** RESET ANSWER
      VARIABLE TA **
8220 TA = 0
8230 REM ** FLASH FOUR
      POSSIBLE ANSWERS THREE
      TIMES EACH **
8240 FOR TN = 1 TO 3
8250 Z = 3
8260 FOR TC = 1 TO 4
8270 Z = Z + 4
8280 VTAB Z
8290 FLASH
8300 HTAB ((40 - LEN
      (Q$(TI,TC))) / 2) + 1
8310 PRINT Q$(TI,TC)
8320 FOR TD = 1 TO 100
8330 IF PEEK ( - 16287) >
      127 THEN TA = TC:TD =
      100:TC = 4:TN = 3: NORMAL
      : GOTO 8410
8340 NEXT TD
8350 VTAB PEEK (37)
8360 NORMAL
8370 HTAB ((40 - LEN
      (Q$(TI,TC))) / 2) + 1
8380 PRINT Q$(TI,TC)
8390 NEXT TC
8400 NEXT TN
8410 HOME
8420 REM ** ENSURE BUTTON
      IS RELEASED **
8430 GOSUB 10020
8440 REM ** IF ANSWER
      GIVEN, CHECK AND AMEND
      SCORE **
8450 IF TA > 0 THEN IF
      Q$(TI,TA) = A$(TI) THEN
      SC = SC + 5
8460 REM ** DISPLAY
      CORRECT ANSWER **
8470 HTAB 10
8480 PRINT "THE CORRECT
      ANSWER IS:"
8490 VTAB 5
8500 HTAB ((40 - LEN
      (A$(TI))) / 2) + 1
8510 INVERSE
8520 PRINT A$(TI)
8530 NORMAL
8540 VTAB 10
8550 IF TA = 0 THEN PRINT

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" YOU DID NOT PRESS THE
  BUTTON IN TIME."
8560 IF Q$(TI,TA) = A$(TI)
  THEN HTAB 4: PRINT "YOU
  WERE RIGHT. SCORE FIVE
  POINTS."
8570 VTAB PEEK (37) + 2
8580 IF Q$(TI,TA) < >
  A$(TI) THEN HTAB 10:
  PRINT "BETTER LUCK NEXT
  TIME."
8590 HTAB 6
8600 VTAB 14
8610 FLASH
8620 PRINT "PRESS THE
  BUTTON TO CONTINUE."
8630 NORMAL
8640 FOR TD = 1 TO 800
8650 IF PEEK ( - 16287) >
  127 THEN TD = 800: GOTO
  8700
8660 NEXT TD
8670 REM ** IF QUIZ
  ABANDONED, ZERO DATA
  POINTERS AND SCORE,
  RETURN TO ATTRACTOR **
8680 PDP
8690 GOTO 80
8700 HOME
8710 REM ** ENSURE
  PUSH-BUTTON IS RELEASED
  **
8720 GOSUB 10020
8730 NEXT TI
8740 RETURN
9000 REM ** SUBROUTINE
  FROM MAINLINE **
9010 REM ** DISPLAY SCORE
  AND COMMENTS **
9020 PRINT "THE HIGHEST
  PREVIOUS SCORE WAS
  ";HC;"."
9030 PRINT
9040 PRINT "YOU SCORED
  ";SC;" OUT OF 100."
9050 PRINT
9060 PRINT "THIS IS ";
9070 ON (SC / 5) + 1 GOTO
  9080,9090,9100,9110,9120,9
  130,9140,9150,9160,9170,91
  80,9190,9200,9210,9220,923
  0,9240,9250,9260,9270,9280
9080 PRINT "ATROCIOUS.":
  GOTO 9300
9090 PRINT "APPALLINGLY
  BAD.": GOTO 9300
9100 PRINT "REALLY
  TERRIBLE.": GOTO 9300
9110 PRINT "TERRIBLE.":
  GOTO 9300
9120 PRINT "VERY POOR
  INDEED.": GOTO 9300
9130 PRINT "VERY POOR.":
  GOTO 9300
9140 PRINT "POOR.": GOTO
  9300
9150 PRINT "FAIR.": GOTO
  9300
9160 PRINT "NOT TOO BAD.":
  GOTO 9300
9170 PRINT "JUST BELOW
  AVERAGE.": GOTO 9300
9180 PRINT "AVERAGE.": GOTO
  9300
9190 PRINT "SLIGHTLY ABOVE
  AVERAGE.": GOTO 9300
9200 PRINT "VERY
  COMMENDABLE.": GOTO 9300
9210 PRINT "HIGHLY
  COMMENDABLE.": GOTO 9300
9220 PRINT "GOOD.": GOTO
  9300
9230 PRINT "VERY GOOD.":
  GOTO 9300
9240 PRINT "VERY GOOD
  INDEED.": GOTO 9300
9250 PRINT "EXTREMELY
  GOOD.": GOTO 9300
9260 PRINT "EXCEPTIONALLY
  GOOD.": GOTO 9300
9270 PRINT "ALMOST
  PERFECT.": GOTO 9300
9280 PRINT "PERFECT. DID
  YOU CHEAT?"
9290 REM ** UPDATE HIGH
  SCORE **
9300 IF SC > HC THEN HC =
  SC: PRINT : PRINT "YOU
  ARE NOW IN THE LEAD!"
9310 VTAB 10
9320 PRINT "PRESS THE
  BUTTON TO PLAY AGAIN."
9330 PRINT
9340 PRINT "OTHERWISE, I'LL
  WAIT FOR SOMEONE ELSE."
9350 RETURN
10000 REM ** SUBROUTINE
  **
10010 REM ** ENSURE
  PUSH-BUTTON IS RELEASED
  **
10020 FOR TN = 1 TO 200
10030 NEXT TN
10040 REM ** ALLOWS TIME
  FOR PUSH-BUTTON TO BE
  RELEASED **
10050 IF PEEK ( - 16287) >
  127 THEN PRINT CHR$(
  7): VTAB 22: PRINT
  "PLEASE RELEASE THE
  BUTTON.": GOTO 10050
10060 HOME
10070 RETURN
11000 REM ** DATA **
11010 REM ** CHANGE THIS
  TO PERSONALIZE YOUR QUIZ
  **
11020 DATA NAME OF YOUR
  QUIZ
11030 REM ** PLACE THE
  CORRECT ANSWERS IN THE
  NEXT TWO LINES **
11040 DATA APPLE
  USER,JANUARY 1984,ONE
  POUND,BASIC,4,STOCKPORT,65
  02,DISC OPERATING
  SYSTEM,RAINCOAT,A PLACE
11050 DATA ANSWER
  TWO,ANSWER FOUR,ANSWER
  ONE,ANSWER THREE,ANSWER
  THREE,ANSWER FOUR,OPTION
  ONE,SUGGESTION ONE,SECOND
  CHOICE,THIRD ANSWER
11060 REM ** IN THE NEXT
  LINE PLACE THE TITLE OF
  YOUR QUIZ **
11070 DATA SUBJECT OF THE
  QUIZ
11080 REM ** IN EACH OF
  THE FOLLOWING TWENTY
  LINES ENTER A QUESTION
  AND ITS FOUR ALTERNATIVE
  ANSWERS **
11090 DATA IS THIS MAGAZINE
  CALLED,WINDFALL,WINDBREAK,
  APPLE USER,APPLE EATER
11100 DATA DID IT CHANGE
  ITS NAME IN,SEPTEMBER
  1983,DECEMBER
  1983,JANUARY 1984,MARCH
  1984
11110 DATA DOES 'APPLE
  USER' COST,FIFTY
  PENCE,SEVENTY FIVE
  PENCE,ONE POUND,ONE POUND
  TWENTY FIVE PENCE
11120 DATA IS THIS PROGRAM
  WRITTEN
  IN,FORTH,PASCAL,ASSEMBLER,
  BASIC
11130 DATA HOW MANY VOLUMES
  HAVE BEEN
  PUBLISHED,1,2,3,4
11140 DATA IS THE MAGAZINE
  PUBLISHED
  IN,STOCKTON,STOCKSBRIDGE,S
  TOCKPORT,STOURPORT
11150 DATA WHICH PROCESSOR
  DOES THE APPLE IIE
  USE,6025,6250,6502,6205
11160 DATA DOES 'DOS' STAND
  FOR,DISC OPERATING
  SYSTEM,DESIGNATED
  OPERATING SYSTEM,DESIGN
  OF SYSTEM,DOWN OUR STREET
11170 DATA WHICH NAME IS
  THE ODD ONE
  OUT,LISA,MACINTOSH,RAINCOA
  T,APPLE II
11180 DATA IS
  'CUPERTINO',SOMEONE'S
  NAME,A PLACE,A
  LIGHTWEIGHT METAL,A DRINK
11190 DATA PUT QUESTION 11
  HERE,ANSWER ONE,ANSWER
  TWO,ANSWER THREE,ANSWER
  FOUR
11200 DATA PUT QUESTION 12
  HERE,ANSWER ONE,ANSWER
  TWO,ANSWER THREE,ANSWER
  FOUR
11210 DATA PUT QUESTION 13
  HERE,ANSWER ONE,ANSWER
  TWO,ANSWER THREE,ANSWER
  FOUR
11220 DATA PUT QUESTION 14
  HERE,ANSWER ONE,ANSWER
  TWO,ANSWER THREE,ANSWER
  FOUR
11230 DATA PUT QUESTION 15
  HERE,ANSWER ONE,ANSWER
  TWO,ANSWER THREE,ANSWER
  FOUR
11240 DATA YOU CAN MAKE THE
  QUESTIONS QUITE LONG IF
  YOU ARE CAREFUL WITH
  THEIR SPACING,ANSWER
  ONE,ANSWER TWO,ANSWER
  THREE,ANSWER FOUR
11250 DATA PLACE QUESTION
  SEVENTEEN HERE,OPTION
  ONE,OPTION TWO,OPTION
  THREE,OPTION FOUR
11260 DATA THIS IS QUESTION
  EIGHTEEN,SUGGESTION
  ONE,SUGGESTION
  TWO,SUGGESTION
  THREE,SUGGESTION FOUR
11270 DATA NOW ASK QUESTION
  NINETEEN,FIRST
  CHOICE,SECOND
  CHOICE,THIRD
  CHOICE,FOURTH CHOICE
11280 DATA THIS IS THE
  FINAL QUESTION,FIRST
  ANSWER,SECOND
  ANSWER,THIRD
  ANSWER,FOURTH ANSWER

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ADDING colour to the scene at Apple '84 was Keyzone, a company which claims to be the first to bring a colour option for the Apple IIc to the market.

Its colour converter uses the 15 pin video connector at the rear of the Apple IIc to link to a linear RGB colour monitor, and takes its video signal direct from the Apple motherboard.

The unit was up and running at Apple '84 and should cost around £120 when released in the UK this month.

Keyzone was also demonstrating its Spectrogram RGB colour card for the Apple II and Apple IIe. The card costs £130

Keyzone 'first' with colour for Apple IIc

and can be used in three operating modes.

The first two offer either a multi-colour or duochrome with Apple colours and the third, accessed by a single POKE command, offers definable colours.

Each of the 16 low-resolution COLOR= numbers as well as the six high-res HCOLOR = numbers can be completely re-defined.

Keyzone says a user has separate control of the red, green and blue components of each colour, giving eight red, eight green and four blue levels.

"This means each colour number can take on 256 different hues—brilliant rainbow colours, soft pastel shades, greys and so on", said a spokesman.

The defined colour set can be changed instantly to a different

set under software control.

"Words and graphics can be made to flash on and off, appear to be the same colour as the background by defining a coloured object, and simple moving animations can be achieved from a single static picture without re-plotting anything at all", the spokesman said.

The card is supplied with a disc containing demonstration programs and a tool kit of machine-language programs that allow the card to be set to any of its modes.

● Keyzone, Regeneration House, School Road, London NW10 6TD. Tel: 01-965 1684.

Compact accounts for IIc

AN accounting system designed specifically for the Apple IIc with a single, integrated disc drive has been released by Ormbeta Software.

Called Ormbeta Compact, it is an integrated sales, purchase and nominal ledger system.

The sales/purchase ledger functions include maintain customer/supplier file, enter sales/purchase transactions, reports and analyses, statements and period end routines.

With the nominal ledger, one can create a chart of accounts, enter transactions, reports and summaries—trial balance, profit and loss, balance sheet, create statements, period/year end routines and update from sales and purchase ledgers.

General facilities include initial set-up and file creation, disc utilities—including a single disc drive copy routine, data security routine which maintains a disc cycle register and index/audit routines.

The full system costs £350 and will also run on the Apple IIe. Available separately for an extra £100 is the Ormbeta Compact Reporting System.

● Ormbeta Software, 14 Aughton Street, Ormskirk, Lancashire L39 3BW. Tel: (0695) 77043.

The easy to handle screen display of the dbSPay package for Macintosh.

Personnel package for £125

A PERSONNEL and payroll application for Macintosh, dbSPay, sells for only £125 and is claimed to be suitable for organisations with between one and 100 employees.

With it, employees can be matched to suit a company's needs. It provides flexible pay input and analyses such as by type of employee or by department.

Main features include support for all tax codes; weekly,

monthly and other payment frequencies; up to 16 pre and post tax additions and up to 19 pre and post tax deductions; rounding of net pay for easier cash analysis; overseas tax allowances; automatic SSP calculation and password protection.

The program caters for all contracted in and contracted out national insurance schemes; payments by cash, cheque, Giro and Autopay; pension schemes

and directors' National Insurance.

Comprehensive reporting facilities include full employee details, payslips, cheque summary, P45, P11/60 details, coin analysis, credit transfer summary, overall pay summary, Bank Giro credits, P35(CS) and address labels.

● Deverill Business Systems, 3 Luscombe Road, Poole, Dorset HB14 8ST.

Accurate decision maker

PERTMASTER is a tool for anyone who has to control a complicated project, where many different activities have to be co-ordinated over an extended period of time.

It is claimed to be especially effective when people are involved, and when fast and accurate decision-making is required throughout the project to ensure that unanticipated difficulties do not cause havoc.

Typical applications include managing a construction site, controlling data processing systems development, planning and implementing a new product launch, designing and building a manufacturing/production line and preparing complex documents such as a large RFP or a company annual report.

Pertmaster uses a sophisticated management tool known as Critical Path Analysis to help managers make quick and correct decisions, using all the up-to-date information available.

Being designed for the busy professional manager, ease of use has been made a main design feature throughout the software and the operating manual. In the same way, the reports have been made as readable as possible.

Non-expert users can benefit from the simplicity and ease of use of arrow networks and graduate, if they wish, to the more powerful, but more complex, precedence format.

● P&P Micro Distributors, New Hall Hey Road, Rossendale, Lancs. BB4 6JG. Tel: 0706 217744.



Maltron keyboard claims 40 per cent increase in speed

Keyboard for non-typists

THE Maltron keyboard is designed to make life easier for Apple users who are not typists.

Stephen Hobday, whose company markets the keyboard, says it is up to 40 per cent faster to use, three times as easy to learn – and it cuts out nine out of 10 errors.

The secret is in the shape, which allows the user to make almost one third of the keystrokes using the thumbs only.

● PCD Maltron, 15 Orchard Lane, East Molesley, Surrey. Tel: 01-398 3265.

Macintosh 'taken to the limit'

A MACINTOSH version of the DB Master database program and a new word processor for the Apple II family were put on show at the recent Comdex exhibition in Atlanta, Georgia.

Parent company Stoneware says the programs, which are still under development, "take the respective machines to their limits".

The database integrates menu-driven operation with the

Macintosh mouse and can display different font styles and sizes on the screen.

Features include on-screen prompts, computed fields, ascending and descending sorts, a built-in report generator, report calculations and a "browse" capability which allows several records to be displayed on screen at the same time.

"As with our other database management systems, it also allows a file to span multiple discs" said Stoneware.

The word processor program, called DB Master Business Writer, is designed, according to Stoneware, for "professionals whose major applications are letters, memos and sophisticated mail merge operations".

A major feature is the direct text merge with files created by DB Master, PFS and Visifile.

● Stoneware, 50 Belvedere St, San Rafael, California 94901. Tel: (0101) 415 6500.

Finance in the home

TWO financial packages designed for the Apple in the home have been released by Hilderbay.

Family Finance is based on the company's existing Bookkeeper package – but excludes features such as VAT analysis and ledger facilities which are not required by a home user.

It costs £39.90. Checkpay, modelled on the

existing Payroll package, performs comprehensive PAYE tax calculations but without the specialised features required by employers – such as record-keeping for many employees and summaries of payments.

It can be used for checking payslips and translating gross pay into take-home pay.

Price: £29.90.

● Hilderbay, 8/10 Parkway, Regents Park, London NW1 7AA. Tel: 01-485 1059.

Language enhanced



SIX new primitives and several editor commands are among the enhancements included in Version 2.0 of Terrapin's Logo language for the Apple II series.

Other features include improved garbage collection capabilities, full-function support for all four cursor keys on the Apple IIe and the ability to read program files created under Apple Logo.

One of the new primitives allows easy switching between two different disc drives, movement of text is made simpler by a YANK command, and the improved garbage collection virtually eliminates the problem of running out of workspace, claims Terrapin.

"We believe the features of Terrapin Logo, its ease of use, highly acclaimed documentation and price makes us the pre-eminent Apple-compatible Logo – and that includes the official Apple Logo", said Sheridan McClees, company president.

Terrapin Logo version 2.0 costs \$145.95.

● Terrapin, 380 Green Street, Cambridge MA 02139. Tel: (0101) 617-492 8816.

ALTHOUGH I think the problem Nick Levy posed at the end of his article in the April 1984 edition of *Apple User* was probably set with tongue in cheek, I am one of those people who cannot resist a mathematical challenge of any sort.

You can formulate the problem for TK!Solver as follows:

(i) If Mary's age now is X and Anne's age now is Y then clearly $X + Y = 44$.

(ii) Z years ago when Mary was $X-Z$ she was three times as old as Anne, hence $X-Z = 3/2 * Z$.

(iii) When Anne is three times Mary's age at that time she will be $3 * (X-Z)$, half of which is $3/2 * (X-Z)$. Mary was that age, A years ago, therefore $X-A = X - (X-Z)$.

(iv) When Anne was $Y-A$. Mary is currently $2 * (Y-A) = X$.

Using equations (i-iv) TK!Solver should be able to produce $x = 27.5$, $Y = 16.5$, $Z = 11$, $A = 2.75$, if my long handed solution of simultaneous equations is correct. — **James M. Coles, Bayswater, London.**

... now more please!

THE teaser at the end of Nick Levy's TK!Solver review can be formulated as follows:

(1) At one time Mary was three times as old as Anne, $M1 = 3 * A1$.

(2) At some future date Anne will be three times as old as Mary was then, $A4 = 3 * M1$.

(3) At another time Mary was half as old as Anne will be at that future date, $M2 = A4 / 2$.

(4) Mary is now twice as old as Anne was at that other time, $M3 = 2 * A2$.

(5) Mary and Anne's current ages add up to 44, $M3 + A3 = 44$.

Unfortunately this in itself is not sufficient for a unique solution as we have seven variables ($A1, M1, A2, M2, A3, M3, A4$) and only five equations. However the difference between their ages is obviously constant, so we can introduce the following:

(6) $DIF = M1 - A1$.

(7) $DIF = M2 - A2$.

(8) $DIF = M3 - A3$.

This gives eight variables and

Just couldn't resist the Levy challenge

The combined ages of Mary and Anne are 44 years, and Mary is twice as old as Anne was when Mary was half as old as Anne will be when Anne is three times as old as Mary was when Mary was three times as old as Anne.
How old is Mary?
Any suggestions on how I could formulate this problem so that it can be understood by my TK! Solver?

● Nick Levy's challenge from his TK!Solver review in the April edition of *Apple User*.

eight equations and so it can be solved uniquely either by matrix arithmetic or by TK!Solver's iterative (trial and error) method.

If you set $A1 = 3$ and turn the handle (as my maths master used to say) you end up with Mary's age ($M3$) as 23, and Anne's age ($A3$) as 21 which satisfies equation (5).

Thanks for an excellent column — why not give us a regular teaser spot to stop me

doing any work! — **Alastair Thompson, Leeds.**

... simple arithmetic

I WAS intrigued by the problem Nick Levy posed as at first sight it seemed baffling, but after some thought I came to the conclusion that it could be solved using simple arithmetic.

The descriptive part of the problem distils down to the statement that one must determine the age of Anne when Mary is $3/2$ times her age when the ratio of their ages is $3:1$ and multiply this by two to get the present age of Mary.

Let Anne equal A and Mary $3A$. Multiplying the latter by $3/2$ gives $9/2A$. This is an increase of $1.5A$ years so Anne must be $(A+1.5A)$. Therefore Mary's present age is $2.5A * 2$, and Anne must be $A+(5A-3A)$.

Thus $5A+3A$ is 44, ie A is

5.5 , therefore Mary is 27.5 and Anne is 16.5.

If you want an equation for TK!Solver it is as follows:

$$2*(A+(9/2A-3A))+A+2*(A+(9/2A-3A))-3A=44$$

— **Peter Bradley, Grange-over-Sands, Cumbria.**

Assembler nightmare

I'VE been making a determined effort to learn assembler language lately and hit on a problem I've never seen discussed anywhere in print.

To gain practical experience in assembler language, you need an assembler program. But while there are lots of assembler packages on offer, they are not always consistent in their use of mnemonics.

For an expert this is presumably no hassle, but it's a nightmare for a beginner, especially if he is working on an assembler listing put together on a package different from his own.

Let me give you a few practical examples. Some commercial assemblers, such as TED II+, use the pseudo-op OBJ.

You can safely leave this out on other assemblers since they default to the value automatically — provided you know what OBJ is all about and realise how your package treats this function.

If you don't know, you're left wondering what to do about that bit of code.

In one published listing, I came across the opcode BLT. The package I was using wouldn't accept it and there was no reference to it in the three assembler language books I've been using.

I thought it might be a misprint for BIT, but soon discovered this didn't do my program any good.

Eventually, by comparing the

POKE 36,X and tabbing problems

IN page 64 of the January 1983 edition of *Windfall* you state how to tab over 40 characters with a printer.

We have been using the statement `POKE 36, X` as you suggest, but find that as we are working on a 40 character screen our Basic programs are being corrupted. How can we overcome this problem?

When working on an 80 character screen there appears to be no problem, but not all our machines are configured for 80 characters. — **M.L. Window, Stourbridge College of Technology and Art.**

● We didn't warn against the use of `POKE 36, X` in the interests of brevity, assuming that readers would understand the

problem of going outside the text window (see page 128 of the Applesoft manual). By the way, your name is very apposite to the problem!

The difficulty is caused by the fact that your printer interface is reflecting the printed text to the Apple's screen. Most parallel interfaces will do this unless commanded otherwise. The usual command to give is `PRINT CHR$(9)“80N”` — but check your manuals to make sure.

If you cannot, switch off the reflection via an interface command or switch check to see if the printer has any tabbing commands which can be sent to it in place of the `POKE 36, X` command. **Max Parrott**

actual code, I discovered it was an alternative to BCC. The same thing happened with BGE, which I gather must be an alternative to BCS.

I'm still trying to figure what DS stands for – it seems to be a pseudo-op which is used extensively in a graphics book I have, with no explanation of its function.

Anyway, not to labour the point, it occurred to me that there must be endless ninnies in assembler out there who would welcome publication of a table showing the major differences in the various popular assembler packages and advising on what to do about them. – **Herbie Brennan, County Kildare, Ireland.**

● You've hit on the only safe way to check these (pseudo) opcode mnemonics – that is to cross-check with the code. I think your idea of a table is excellent – however we don't have access to all assemblers.

I should like, therefore, to throw this open to our readers.

If you have an assembler – especially those other than the DOS 3.3 Toolkit or Lisa version 2.5 assemblers – please send me details of the use of OBJ, ORG and the various comparison and memory saving (such as the DS quoted by Mr Brennan) mnemonics used, together with any details of your assembler, its use of the Apple's memory and any other details you think are relevant.

I will try to relate these details and publish the result.

Please send details, even if you think you are only a beginner – it will help us all.

Max Parrott

Praise from Greece

I THINK that with your new name you give readers new material and richer to read. Your reviews seem to me to be more detailed.

I hope you keep up going this way as for us you are the source of reliable information which we can trust and the only way in my opinion to avoid the many times misleading advertisement.

One question – I want to ask

about the mouse, it's always referred to the IIe. Will Apple II Plus be able to use it as well? – **Dr A.N. Fanariotis, Athens, Greece.**

● The mouse IIe will run on an Apple II Plus provided that it has 64k memory. In other words that it uses a language card.

Bring us together

PERHAPS Windfall (I prefer this title) could do more by linking readers instead of the shut-out response of "Try reading A. N.

Other's book Solving Problems in 64k Easy Ways".

Full addresses being given for readers who could be assisted by others might reduce the isolation felt by many young – and not so young – programmers. – **G. Mathieson, Strood, Kent.**

Pepped-up Patience

I HAVE enjoyed using Mr Gilbertson's Patience program published in the January 1984 Apple User.

I found that the eventual finish was rather a non-event, so I have added a small routine to check when eight columns of cards are filled, and then to print a suitable message of congratulation.

I also put in a sound routine to give a beep each time a card is moved. The altered and new lines are:

```

422 REM CHECK IF FINISHED
425 IF CO = 8 THEN GOSUB
    40000: GOTO 460
1120 VTAB 20: INPUT "DO YOU
    WANT SOUND ON?";A$: IF
    LEFT$(A$,1) = "N" THEN
    POKE 770,96: GOTO 1130
1125 POKE 770,172: REM
    TURN SOUND BACK ON
2030 DIM CH(14): FOR J = 0
    TO 14:CH(J) = 0: NEXT
2040 RETURN
12020 CO = 0: GOSUB 12220:
    IF CO = 1 THEN POP : GOTO
    180
12030 RETURN
12210 REM CHECK M CARDS TO
    BE MOVED ARE IN SEQUENCE
12220 FOR TD = P(0,TC,2) -
    M + 1 TO P(0,TC,2) - 1
12230 REM CHECK ALT
    COLOURS
12240 IF ABS (P(TD,TC,2) -
    P(TD+1,TC,2)) < 120 THEN
    12290
12250 REM NOW CHECK
    NUMERICAL ORDER
12260 TN = P(TD,TC,2) -
    P(TD + 1,TC,2)
12270 IF TN = -202 OR TN =
    -198 OR TN = -185 OR TN =

```

```

-165 OR TN = -127 OR TN =
129 OR TN = 155 OR TN =
182 OR TN = 186 OR TN =
199 THEN 12310
12290 IF CC = 1 THEN CO =
    1: RETURN
12300 PRINT CHR$(7);:CO =
    1: RETURN
12310 NEXT TD
12320 RETURN
16085 POKE 768,2: POKE
    769,100: CALL 770
17100 POKE 768,50: POKE
    769,2: CALL 770
18095 POKE 769,50 + 10 *
    TD: POKE 768,1: CALL 770
19020 P(0,DC,2) = P(0,DC,2)
    + M
19030 P(0,TC,2) = P(0,TC,2)
    - M
19040 IF CH(TC) = 1 THEN
    CH(TC) = 0: CO = CO - 1
19050 IF P(0,DC,2) = 13
    THEN CC = 1: TC = DC:M =
    13:CO = 0: GOSUB 12220:
    CC = 0: IF CO = 0 THEN
    CH(DC) = 1: CO = CO + 1
19070 RETURN
30000 POKE 770,172: POKE
    771,1: POKE 772,3
30010 POKE 773,174: POKE
    774,1: POKE 775,3
30020 POKE 776,169: POKE
    777,4: POKE 778,32
30030 POKE 779,168: POKE
    780,252: POKE 781,173
30040 POKE 782,48: POKE
    783,192: POKE 784,232
30050 POKE 785,208: POKE
    786,253: POKE 787,136
30060 POKE 788,208: POKE
    789,239: POKE 790,206
30070 POKE 791,0: POKE

```

```

792,3: POKE 793,208
30080 POKE 794,231: POKE
    795,96: POKE 796,0
30090 RETURN
40000 REM FINISHED
40100 HOME : FOR J = 1 TO
    39: POKE 769,10 + 6 * J:
    POKE 768,1: CALL 770:
    PRINT"*": NEXT : PRINT
40110 VTAB12: PRINT "
    WELL DONE - YOU MADE IT"
40120 VTAB 22: FOR J = 1 TO
    39: POKE 768,1: POKE
    769,260 - 6 * J: CALL
    770: PRINT "*": NEXT
40130 FOR J = 1 TO 500 :
    NEXT : HOME
40200 RETURN

```

CO holds the count of completed columns. Line 425 checks CO.

The array CH() holds 1 if a column is completed, 0 if isn't.

The subroutine at 19000 is extended to check if there are 13 cards in a column. If there are then the altered subroutine at 12000 checks if they are in order K to A.

If they are then the CH() value for that column becomes 1 and CO is incremented.

CC is used to cancel the error bell if the 13 cards aren't in order.

Subroutine 13000 POKES in the sound routine which is called when cards are moved.

If no sound is requested then 770 is POKED with 96 to give a straight return to Basic. – **E.R. Mather, Sheffield.**

● See Feedback in the February (Page 70), April (Pages 66, 67) and June (Page 75) issues of Apple User for other ideas about our listing of Patience.