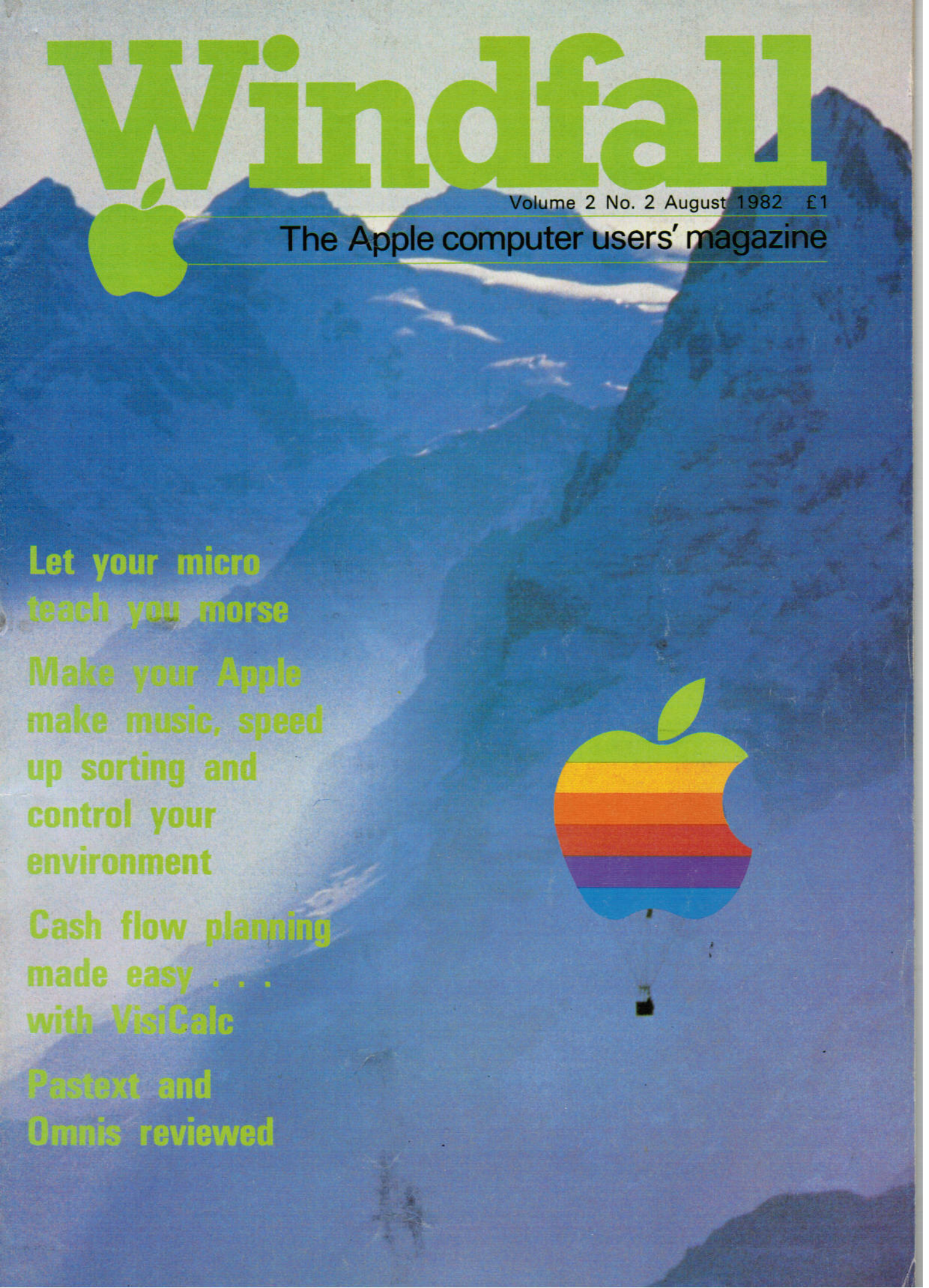
Windfall

Volume 2 No. 2 August 1982 £1

The Apple computer users' magazine



Let your micro teach you morse

Make your Apple make music, speed up sorting and control your environment

Cash flow planning made easy . . . with VisiCalc

Pastext and Omnis reviewed

the 8" Apple

Eicon's dual 8" floppy disk drive system gives the Apple over 2 Megabytes of on-line capacity, enough, for instance, for 15000 items in stock control, or an integrated business system with several thousand accounts.

Of if you need the extra capacity of a hard disk, a single 1 Megabyte floppy disk drive can be an ideal back-up medium.

Eicon's intelligent disk controller, with its unique EDOS firmware, provides complete integration with standard Apple software. DOS, Pascal and CP/M are all fully supported.

With additional software, Eicon drives allow the Apple to read and generate both IBM and DEC floppy disk files.

Prices are from around £1200 to £1900. S100 Bus floppy disk systems are also available.

Software available from Eicon includes:

SYSTEMATICS FINANCIAL CONTROLLER SUITE

WORDSTAR, CALCSTAR, DATASTAR etc.

STOP PRESS

New distributor appointed for Benelux: BIT COMPUTERS Antwerp 359800

Eicon disk systems have a full 12 months warranty, and are supported by the larger Apple Computer dealers throughout the UK. On-site maintenance is available if required.

Franchised distributor:
Access Data Communications Limited,
Tel: (0895) 30831, 59016, 59205

Apple make the computer . . .
Eicon make the difference.

EICON
RESEARCH

Eicon Research Limited, Viking Way, Bar Hill, Cambridge CB3 8EL. Telephone 0954-81825

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Vol. 2 No. 2 August 1982

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Writing for Windfall: Articles and programs relating to the Apple are welcome. Articles should preferably be typed or computer-printed, using double spacing. Unsolicited manuscripts, discs, etc. should be accompanied by a self addressed stamped envelope, otherwise their return cannot be guaranteed.

PUT ONE OVER ON APPLE II.

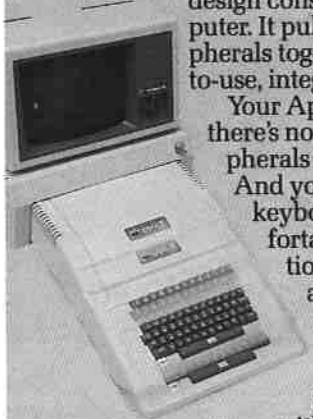
Introducing Station II.
The Apple II Support System.

What happens when you put one over on Apple II? You make it better. Because Station II organizes, simplifies, protects, secures and lets you control access to your Apple. In other words, it makes your Apple II your personal computer.

IT'S DESIGNED FOR II-GETHERNESS.

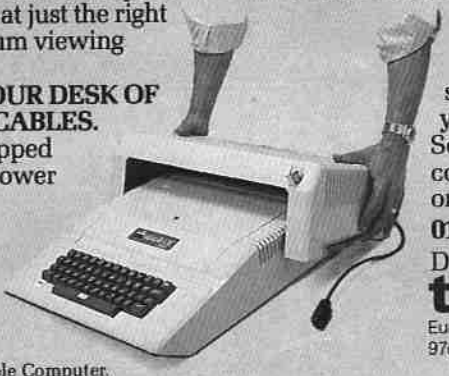
Station II is designed specifically for Apple II by design consultants to Apple Computer. It pulls your Apple and peripherals together into an attractive, easy-to-use, integrated system.

Your Apple is free to slide in and out, so there's no unstacking and restacking peripherals everytime you need to get inside. And you can choose the distance from keyboard to monitor that's most comfortable for you. Station II even positions your monitor at just the right angle for maximum viewing ease.



IT CLEARS YOUR DESK OF CORDS AND CABLES.

Station II is equipped with three built-in power outlets, so the cords and cables that normally clutter your work area are tucked away neatly inside. Now one cord, Station II's own, powers your entire system.



THE KEY IS SECURITY AND CONVENIENCE.

You're not the only one who's discovered the value of Apple II, so Station II has a key. And a lock. And two ways to secure it. Now you can slide your Apple inside, lock it and leave it. Safe and sound. It puts the clamps on theft, and beyond that, you control who gets inside your Apple and who doesn't.

Your programs are safe, too. Because Station II has a line voltage surge suppressor, ready to intercept power surges before they can wipe out your program.

What's more, the key means convenience. With one twist of the wrist you can power up your entire system. Plus, you can lock your Apple "on" or "off."

So look for Station II at your computer dealer. Please phone or write for dealer nearest you.

01-286-8845

Dealer enquiries welcome.

trace

European Distributor: Fletcher Dennys Systems Ltd.
97c Elgin Ave., London W9 2DA

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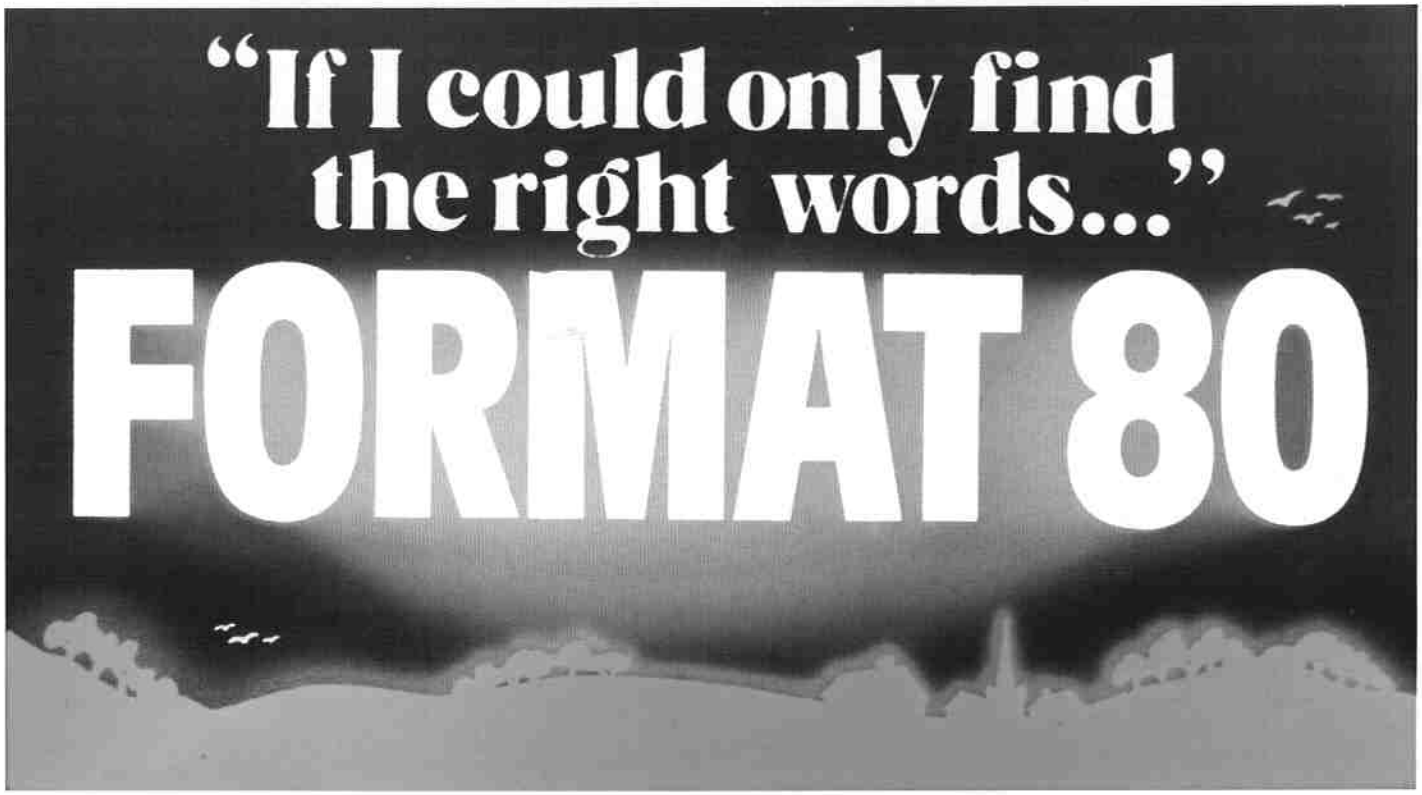

positively the last word in processing

Many people think that because a personal computer does difficult things it must be difficult to operate. Not so. At least not so with the Format-80 professional word processing system.

The Format-80 system lets you and your staff concentrate on doing your work, not on working your computer.

* **EASE OF USE** is the cornerstone of Format-80. Anyone who can use a typewriter keyboard soon feels at home using Format-80 on the Apple II. Example - upper case characters are generated using the shift key - a lot of word processing systems use the ESCape key. Editing commands are introduced using a one keystroke mnemonic command.

* **FEATURES** of entering and editing text make Format-80 the favourite word processing system with office staff. Automatic carriage return insertion (word wrap around) means that they do not have to be concerned with line length; text is automatically adjusted to fit within defined page dimensions.

* **PROFESSIONAL PRESENTATION** of text is enabled using the powerful formatting capabilities of Format-80. Text centreing and justification, coupled with paragraph indentation allow production of high quality work with little effort. Text manipulation commands allow tabulation of columns of figures and easy insertion, location/correction and deletion of text. Whenever text to amended the changes are displayed immediately on the screen - including underlining.

* **PRINTING** of text may be performed on all popular printers. (Telex tapes can be produced directly from an Apple using Format-80). Proportional spacing, emboldening, shadow printing and sub and supercripts are all available on printers which support these functions.

* **COMPREHENSIVE MAIL LIST** facilities allow storage and retrieval of names and addresses which may be printed on adhesive labels or incorporated into documents using standard or specialised paragraphs. Powerful 'logic' commands make it possible to select only those records which match specified criteria.

* **TECHNICAL DETAILS** for the non-technical: Format-80 runs on the Apple II with 48K of memory Apple disk drive and a monitor. An Omnivision or Videx card is also required to provide the 80 character per line display.

* Format-80 is available from most Apple dealers or direct from Personal Computers Limited and costs £300 (ex VAT) - this includes the mail merge facilities as well as a mailing list sorter.

Please send me details of Format-80 and the address of my nearest supplier:

Name .....

Company .....

Address .....

.....

Phone: .....

I do/do not own an Apple Personal Computer. .....

Personal Computers Limited

218 & 220/226 Bishopsgate, London EC2M 4JS. Tel. 01-377 1200

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Epson MX80FT-3 as above + Friction Drive	329.00	378.35
Epson MX82FT-3 As Above + Hi-Res Graph	359.00	412.85
Epson MX100Ft-3 100 CPS & wide carriage	439.00	504.85
Integrex CX-80 Colour	720.00	828.00
Tec Starwriter 40cps	990.00	1138.50
Nec 8023 100CPS 80 col. HI RES Graphic	339.00	389.85
Silentype & Interface	159.00	182.85
Seikosha GP-100A 80 col. & Graphics	175.00	201.25
Star DP8480P 80 cps 80 col. FT	285.00	327.75
Mannesmann Tally MT 120 160 cps	410.00	471.50
Microline 82A 120CPS 80/132 col	360.00	414.00
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Epson Graphic	75.00	86.25
MBP-16k (Epson 16k buffer)	96.00	104.10
Grappler graphics (Epson/Anadex/Cent/P.tig)	98.00	112.70
Seikosha	69.00	79.35
Star DP 8480 P	65.00	74.75
CX80 Colour Card	80.00	92.00
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Digitek RS232 (BAS/CPM/PASCAL)	70.00	80.50
CPS Multifunction card (inc clock)	119.00	136.85
U-Micro (13 Baud rates, BAS/CPM/PAS)	90.00	103.50
80 COLUMN CARDS		
Super-R-Terminal	182.00	209.30
U-Term (inc shift mod)	149.00	171.35
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Videx videoterm	157.00	180.55
Videx Softswitch (40/80)	23.00	26.45
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Zenith 12" Green	89.00	102.35
BMC 12" Green	119.00	136.85
Microvitek col mon (by far the best)	264.00	303.60
Microvitex Colour Card	35.00	40.25
Eurocolour Card	65.00	74.75
Digitek Colour Card	99.00	113.85
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Versawriter Graphic Digitizer	138.00	158.70
Zoom Grafix	23.95	27.54
Higher Text II (many different fonts, sizes, cols)	25.00	28.75
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Graphic package A2-3D1 (Sublogic)	39.00	44.85
Graphic Enhancement A2-3D2 (Reg above)	15.95	18.34
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Saturn Navigator (needs A2-3D1 & A2-3D2)	15.95	18.34
Graforth (3D shapes in colour)	43.00	49.45
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Tasc Compiler (handles large progs)	84.95	97.69
Expediter II	55.00	63.25
Speed Star	75.00	86.25
Lisa (Assem lang dev system)	55.00	63.25
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Assembly lang. Dev. 6502,Z80 or 8080	75.00	86.25
Locksmith 4.1	63.00	72.45
Super Disk Copy III	20.00	23.00
Back It Up II+	48.00	55.20
The Inspector	35.00	40.25
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Fast DOS	19.45	22.37
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VC Expander (for above)	55.00	63.25
VC-Expand/80	65.00	74.75
The Mill 6809 with Pascal speed up	189.00	217.35
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Romplus Card Inc K/B Filter	120.00	138.00
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Music System (Mountain Computer)	211.00	242.65
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Echo II Speech Synthesizer	135.00	155.25
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Mbasic Compiler (CPM)	187.00	215.05
Lisp Interpreter	68.00	78.20
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BUSINESS SOFTWARE INC MANUAL		
Visicalc 3.3 (new version)	110.00	126.50
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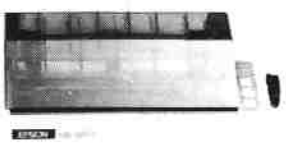
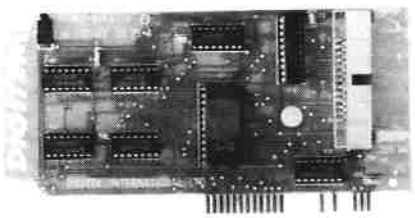
Data Star (CPM)	115.00	132.25
Calcstar (CPM)	85.00	97.75
dBase II (CPM)	349.00	401.35

THIS MONTH'S SPECIAL OFFERS



THE NEW EPSON MX80FT TYPE 3

The low noise, high performance printer with 40, 66, 80 or 132 columns and high res. graphics. Special price £329.00 inc. p&p + VAT.



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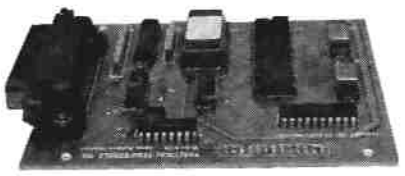
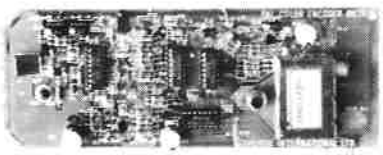
Full graphics dump inc. Inverse, Double Density, Double size, 90° Rotation. Adj. margins & page length. Our price £69.00 + VAT.



MBP-16K EPSON 16K BUFFER

Takes just 4 secs to accept a 16,000 character document, and then returns use of Apple to user, leaving Epson to get on with printing. £96.00 + VAT.

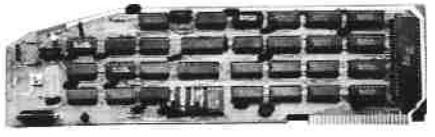


DIGITEK COLOURCARD

This amazing card gives high quality colour and includes a wide band modulator, simply plug in your TV or monitor. Just £99.00 + VAT.

14" MICROVITEK COLOUR MONITOR

Besides offering a crystal clear display in either text, hi-res or low res models it also includes following features – 16 text colours, B/grd colours, 16 hi-res colours, 80 col, card compatibility. A superb colour monitor for £264.00 + VAT.



U-TERM 80 COLUMN CARD

Compatible with BASIC, PASCAL and CP/M. Includes an easy to install shift key accessory. Also a utility disc for loading alternative fonts is provided. For all this we just ask £159 + VAT.

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PFS Filing System (new improved)	68.00	**78.20**
PFS Report	53.00	**60.95**
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Tick box for our list of games ☐

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WF14

UCSD Pascal Version IV – now available for the Apple.

Softech's version IV of the UCSD p-system and language compilers are now available from Protocol Computer Products. Version IV is the version implemented on most other micro-computers including IBM, Xerox 820, Philips P-2000, Texas Instruments, Altos and DEC.
Your Apple can now be used as a development system for software which will run on any Version IV p-system, by installing Softech's Version IV p-system, and one of the language compilers: Pascal, Fortran, Basic, 8-bit and 16-bit assemblers and cross-assemblers.

Version VI of Pascal offers you these advantages over Apple Pascal:

★ improved Editor ★ concurrent processing ★ dynamic memory management ★ much-improved library facilities – no limit on segments and libraries ★ I/O re-direction ★ debugger ★ comprehensive screen control unit ★ true DISPOSE ★ useful utilities

Please ask for our literature giving further details and pricing info.

£££ NEW FROM THE AUTHORS OF "Beneath Apple DOS" £££ "BAG OF TRICKS"

Four outstanding utility programs with over 100 pages of essential reading for all disc users. A real software investment at £21.95 plus VAT. Add £1.15 (includes VAT) for postage.

Other books available: (Please 75p postage to prices below)
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the product that speaks for itself!

AppleVox is a completely self contained unlimited vocabulary speech synthesiser. Designed expressly for the Apple, the card occupies any free slot and is extremely easy to program giving high intelligability and unlimited vocabulary.

Unlike limited-vocabulary synthesisers, AppleVox uses the principle of phoneme synthesis. Since phonemes are the "building blocks" of speech this principle allows the rapid and easy construction of any length speech segments with a very low usage of memory – typically 7 bytes per word.

The AppleVox card is supplied complete with full documentation, demonstration tape software and guaranteed for 90 days.

We can honestly say that AppleVox is nearly as good as human speech but why not call us after 6pm and listen to our computer talking through AppleVox.

You may place a credit card order or a request for further information after the message.

£62 exc vat

Mutek

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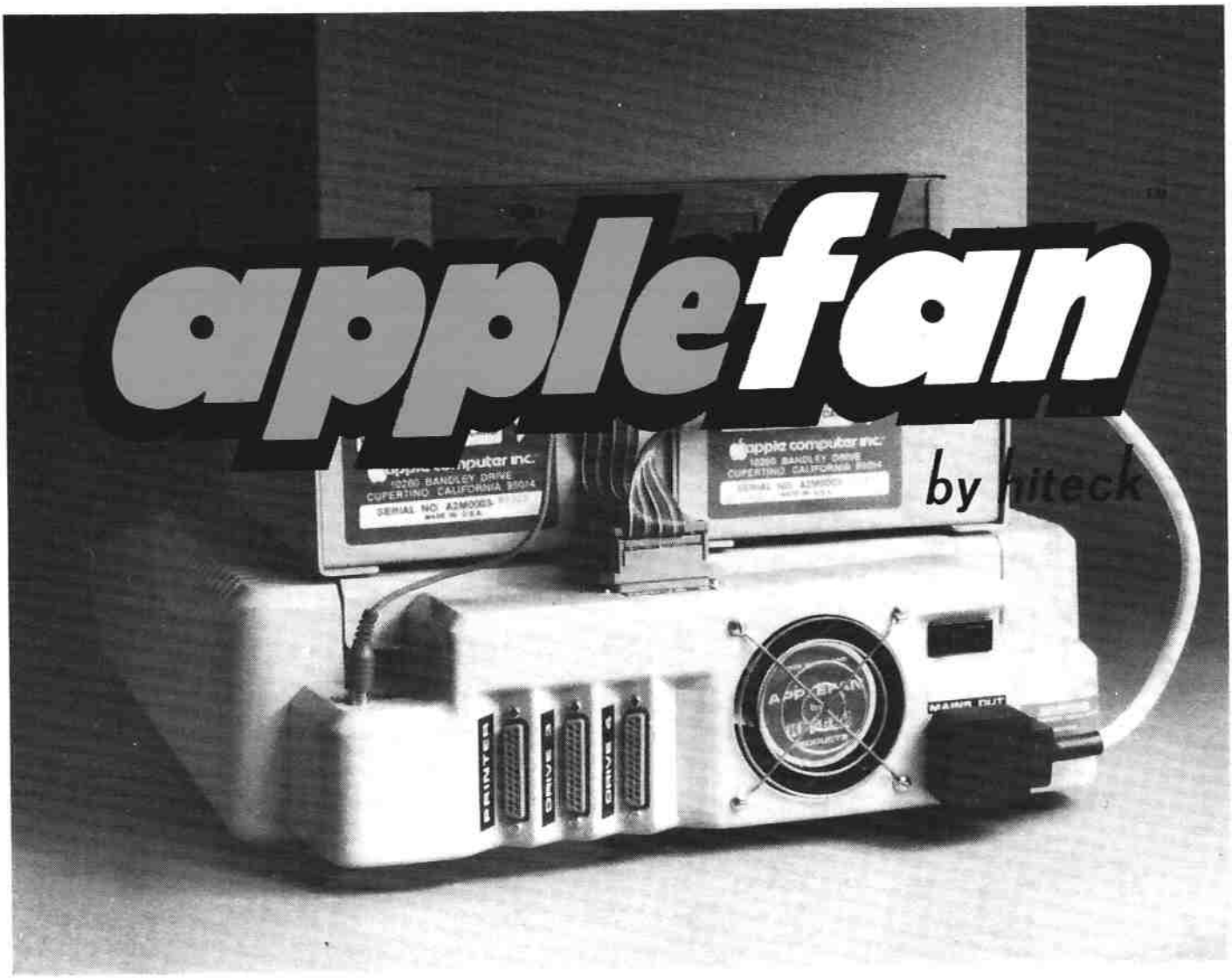
Tel: Bath (0225) 743289



The cool way to stay tidy!

The Apple is a great micro-computer, but sooner or later you'll want to expand it to suit your own requirements.

Disk drives, printers, specialist boards, etc...

Applefan is a neat fan housing which not only has a very efficient and quiet fan to keep the extra circuits cool, but also can incorporate extra sockets for your peripherals, providing easy and reliable connection to all internal circuits.

No soldering or drilling is required to fit Applefan, and access to the lid is not impeded.

See your nearest Apple dealer for a demonstration!

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Hiteck Products

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Telephone: 0438 812137.

Distributed by:

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Data Efficiency Ltd

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Telephone: 0442 40571/2. Telex: 825554 DATEFF G.

PETE & PAM COMPUTERS

Waingate Lodge, Waingate Close, Rossendale, Lancs. BB4 7SO.
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No 1

FOR DIGITAL X–Y PLOTTERS

If you are looking for a high quality X–Y Plotter, then look no further, we will almost certainly have one from our large range to suit your requirements (we have 14 different models in A3 size alone). Our Watanabe Plotters are available in sizes from A3 to A0, flatbed or drum type, with a choice of 1 up to 10 pens. With parallel, RS232 or IEEE interfaces.

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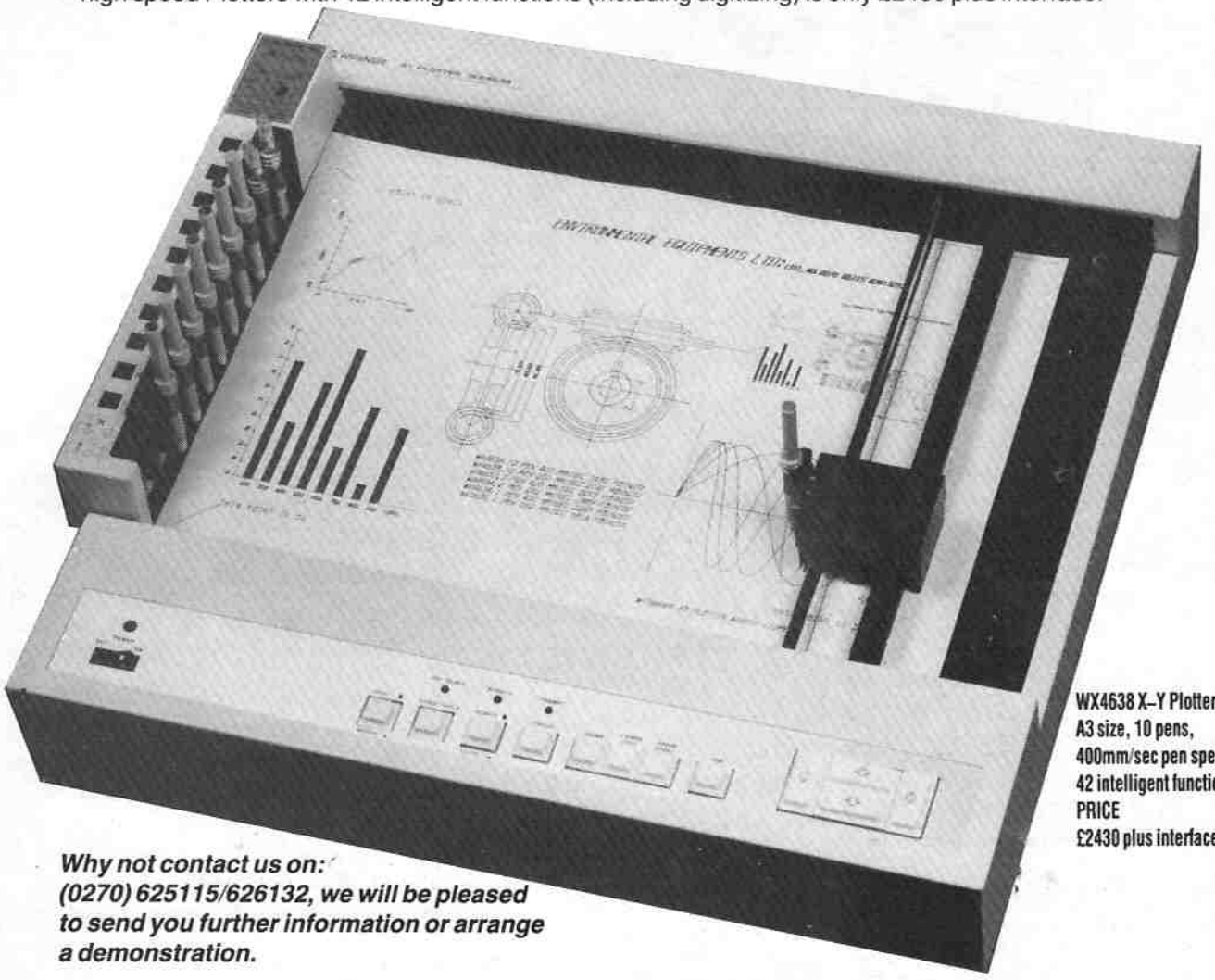

WX4638 X–Y Plotter
A3 size, 10 pens,
400mm/sec pen speed,
42 intelligent functions.
PRICE
£2430 plus interface

Why not contact us on:
(0270) 625115/626132, we will be pleased to send you further information or arrange a demonstration.

**** Graph Plotting Software now available***

Environmental Equipments (Northern) Limited

Tel: Nantwich (0270) 625115/626132

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It's our Birthday

Two years old this August, Pete & Pam Computers send greetings to all their customers.

In August 1980 Pete and Pam Fisher set up a business selling hardware and software for Apple Computers. In two years the business has grown to encompass offices in both London and Lancashire, 22 employees and an annual turnover that is rapidly approaching eight figures.

We have earned distributorships from over 50 hardware and software companies, many of whom are "household" names, including BASF, Broderbund, Epson, Interactive Structures, NEC, Orange Micro, On-Line Systems, Micro Pro., Microsoft, M & R, Saturn Systems, Sirius Software, Videx, Versa Computing and Zenith, to name but a few.

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Our reputation for sound advice, comprehensive stocks and prompt delivery has been a major consideration in the decision of over 500 Apple dealers, numerous multi-national and large companies and many thousands of individuals to buy from Pete and Pam.

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Loads and saves standard DOS files

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timekit

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The first game to successfully combine the best elements of adventure and real-time arcade action.

- With nothing but a smuggled pistol and 10 bullets you must escape from a Nazi castle, after first finding and taking secret war plans.
- You actually hear goosestepping guards challenge you – in German of course!

Addictive and challenging – the most interactive game so far.

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- Make an epic journey through the past and future history of the world and universe.
- Cast of thousands includes Cavemen, Julius Caesar, Christopher Columbus – and You.
- Took over a year to develop – takes longer to play!

Comes on **eight** double sided disks – the ultimate adventure from On-line Systems.

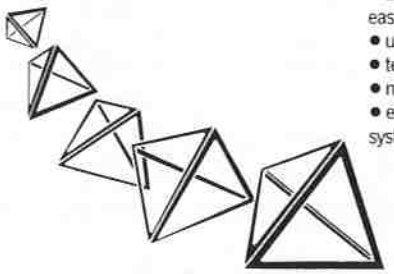
No. 1 US Adventure * **£50**

Tomorrow's Software Today

GraFORTH

The Apple Graphics Language

from insoft – specially created to get the most out of the graphics capabilities of your Apple.



- draws 3D images in colour, at rates that make animation easy
- user defined character sets (any size, colour or typeface)
- text and graphics can be mixed on any part of the screen
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- excellent built-in demo shows the full capabilities of the system

Ideal for entertainment software development, and any application where sophisticated graphics are required.

Incredible value at **£65**

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from insoft

The only music synthesiser for the Apple that plays **two-part music** without the need for expensive extra hardware.

- Play music at the Apple keyboard
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SCREEN WRITER

A Complete Professional Word Processor for Apple Computers

SCREEN WRITER is a state-of-the-art word processor that gives you the highest control of the written word available for the APPLE Computer.

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SCREEN WRITER is a complete word processing system. All you need is a standard 48K APPLE II/II+ computer system with a DOS 3.3 disc drive and a printer. No expensive "extra" hardware that costs you money and causes problems. It even has features that other micro-computer word processors CAN'T offer; features like printer spooling*, upper/lower case, seventy columns on screen and a software based keyboard buffer. ALL these features are available without the need for additional hardware. SCREEN WRITER is the only word processor that offers all these features without special hardware.

SCREEN WRITER is a professional word processor, yet is simple enough for even a novice to understand. The first time user and the word processing professional can feel equally comfortable with the system in a very short time.

SCREEN WRITER was built to be user friendly. The processing commands are easily learned, and a complete listing of the commands is included in the actual program. A handy user reference card is also included for quick reference to printing and editing procedures.

FEATURES

*GLOBAL SEARCH AND REPLACE. Change whole words and sentences throughout a file, quickly and easily.

*INSERT AND CHANGE MODES. Two editing formats to assure full coverage of your word processing needs. Insert Mode allows you to insert text by moving text forward to make room for it. The Change Mode allows you to write over old text, deleting it at the same time. Switching between edit modes is as easy as one keystroke.

*MACRO CAPABILITIES. Assign commonly used words, phrases or commands to special keys, making your processing more efficient by eliminating the need to type in the same sections of text multiple times.

*SUPPORT OF SPECIAL FUNCTIONS. Special commands allow you to initiate and change values in special printer drivers and BLOAD Hi-Res images for plotting on your printer.

*PROPORTIONAL SPACING. Supports proportional spacing on many printers (NEC, QUME, DIABLO, CENTRONICS).

*TEXT MOVE. Move whole sections of text around with just a few keystrokes.

*GENERATION OF INDICES. Generate up to four tables or indices while you type in your document with a few simple commands.

*PRINTER SPOOLING. Makes your word processing time more productive by allowing you to print and edit at the same time.

*Printer spooling is only available for printers with SSM AIO (Parallel or Serial interface), The APPLE parallel interface card or Epson interface card.

*SUPPORT OF YOUR EXTRA HARDWARE. **SCREEN WRITER** makes full use of your RAM cards and extra disc drives to make word processing quicker and easier.

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*FORM LETTER CAPABILITIES. Generate form letters from mailing lists you create quickly and easily. Special commands allow conditions to personalise your form letters.

*COMPLETE EDITING AND RUNOFF FUNCTIONS. Centring, boldfacing, underlining, complete formatting and direct interface with your printer.

LARGE FILE SIZE. **SCREEN WRITER** will handle documents up to 65,000 characters or over 50 A4 pages. Plus you can link files together as you want.

*CURSOR MOVEMENT. Movement of the cursor in your text by character, word, line, page or to the beginning or end of the document.

SCREEN WRITER
is available for £73.95

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ACCESS

SIMPLY THE BEST DATA BASE MANAGER AVAILABLE FOR THE APPLE

– SPECIFICATIONS –

I. DATA FIELD TYPES:

* Numeric
* Alpha characters A to Z and special characters
* Alphanumeric fields combining the above field types
* Calculated fields

II. STORAGE METHOD & RETRIEVAL TIMES:

ACCESS uses a powerful IRAM (Indexed Random Access Method) filing system. Records are stored in entry order. The index consists of the first characters of a specified field of each record (the number of characters used is dependent on the record size). Any record can be retrieved in less than 3 seconds if requested by it's index. Indexes may be created from any field (and stored for later use). Up to 8 indexes may be stored on each program disk. Any record on a diskette can be retrieved in less than 23 seconds using various criteria such as OR, AND, Wild Card, global or range searches on a field or number of fields.

III. CAPACITY:

* Up to 1521 characters per record
* Up to 39 fields per record
* Up to 39 characters per field
* Up to 20 calculated fields per record (calculated fields are not stored on disk)
* up to 39 screen pages per record
* Maximum of 2800 records per diskette (depending on the size of the records)
* Up to 8 screen forms may be saved on each program disk (includes short forms which display only a portion of the record for rapid update/validation)
* Up to 8 defined report formats may be saved on each program disk

IV. SPECIAL FEATURES:

* Title only fields (do not take up valuable data space)
* Word processor style editor (delete/insert characters etc.)
* Hidden fields
* Simple command structure – Commands may be stacked for fast update and retrieval
* Free format screen design – Very easy to use
* Report generator allows additional calculated results, headings, column subtotals, totals etc.
* Logging of updated records
* Automatic or manual update of records
* Sorts may be merged
* A copy program is provided to enable back-up copies of the program and data disks to be made
* Standard DOS 3.3 text files may be produced in either sequential or random access format using any sorted or selected fields
* Deleted records may be un-deleted or purged from the database
* 7 second boot-up of program

V. SYSTEM REQUIREMENTS:

1. Apple II Plus 48K
2. 1 or 2 disk drives (2 recommended)
3. DOS 3.3 Disk Operating System
4. ACCESS supports most makes of printers (special control characters may be sent to the printer as required)
5. ACCESS will support most 40 or 80 column upper and lower case hardware modifications
6. Versions of ACCESS will be available to support the SyMBfile 5 megabyte Winchester drive and the SyMBstore 8 megabyte 5 inch floppy system

ACCESS is available for **£199.95** including VAT from all good Apple dealers or direct from:

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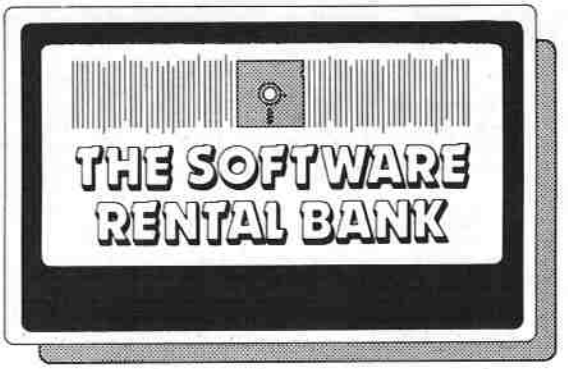
"Test-drive your software?"



You can buy software without trying it first...

The trouble is — sometimes it doesn't meet your particular needs.

— **And** it doesn't *always* live up to all of the advertising claims made for it.

— **And** often the write-ups you read about it (even in the best magazines), are just not *specific* enough.

— **And** even though your dealer *wants* to help, he's hard pushed to find the time for a full demonstration.

When it comes to purchasing software, the list of pitfalls is endless.

We have started the **Software Rental Bank** because we believe you should have the opportunity to evaluate software, on your own machine, with your own data, *before* committing yourself to a purchase.

And if you do decide to purchase — **the rental is free.**

The Software Rental Bank offers a unique range of services

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- ★ Free rental if you decide to purchase.
- ★ Access to the newest software available - a chance to simply 'taste' some of the latest and most controversial products.
- ★ A really wide range of software including most of the well-established packages available such as the "Visi" range, Micromodeller and the Wordstar range.
- ★ Speedy Service. Join the Bank and rent software by telephone or by mail. - all the items on our Software Asset Listing are held in stock.
- ★ An advisory 'hot line' in case you have difficulty with a rented package.

Our service is designed to give you all the time you need to evaluate the software packages you rent, and to find out if they suit your particular application. The Software Rental Bank takes the risk out of software purchasing.

The Software Rental Bank is operating now

The Bank is already in operation and is currently supporting the Apple II computer - including CP/M products for use with the Z80 softcard. Software for other microcomputers including the Sirius, the IBM Personal Computer and certain CP/M machines will be added to the Bank shortly.

Members will periodically receive our *Software Asset Listing* which gives details of the packages available for rental. Members are encouraged to nominate new items for addition to our stock.

Membership is open both to individuals and to organisations and can cost as little as £30 a year.

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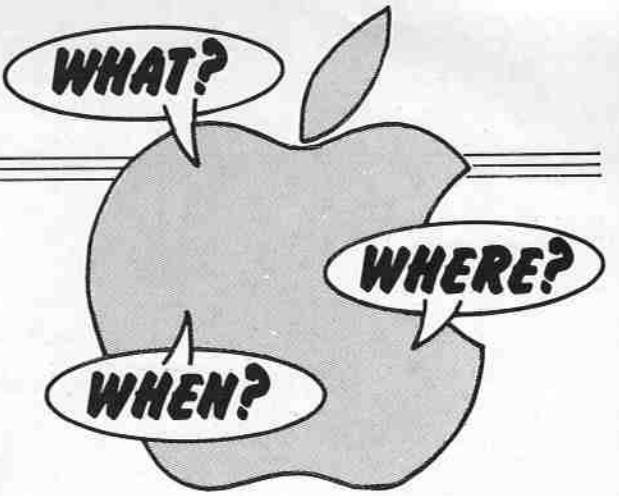
WHAT'S NEWS...



By David Creasey

America picks up an Apple tip

REMEMBER how, at the end of last year, the BBC made history by successfully broadcasting Apple software over the air as part of Tomorrow's World? Well Apple co-founder Steve Wozniak has decided to get into the act.

Now it has been proved to work, the Americans are going in for broadcast software in a big way – and they feel Wozniak is the man to mastermind the operation. He's been persuaded to become director of the software distributing side of a broadcast digital information service being set up by the US National Public Radio.

Earlier this year National Public Radio started talking with the National Information Utilities Corporation on the feasibility of transmitting text and data over the subcarriers of its FM radio signals, to be picked up and fed to home computers with the aid of a special adaptor.

The name given to Wozniak's new task force is INC Telecommunications, and we should be hearing quite a lot about it in the future.

Ever since those Apple-in-the-garage days, Wozniak has had a reputation for turning everything he touches into gold. So it's not too surprising that he should be forecasting a $4 million surplus on the operation within the next five years.

Not bad for the offshoot of an organisation that proudly boasts that it is a strictly non-profit making body.

Flashback to that historic Tomorrow's World broadcast

. . . from the BBC

Getting into viewdata

APPLE Inc has announced that it will be selling a $595 add-on board for its micros that will allow them to work with the Canadian Telidon viewdata system.

The company had also been considering Prestel and its French rival Teletel, and its decision is seen as a blow to British hopes of establishing Prestel as a world standard for viewdata terminals.

Telidon is said to have superior on-screen graphics compared to the British and French viewdata display methods, which use an alpha-mosaic method of presenting information. The Canadian system employs an alpha-geometric technique which needs more sophisticated electronics in the terminal, but which produces properly curved lines.

Apple Inc, which plans to promote Telidon as a cheap way to create computer graphics, says that if the system is successful in North America it will launch it in Europe.

Meanwhile a spokesman for Apple UK commented: "It rather depends on what support each system is given. We are currently involved with Owltel, which links into Prestel. It is a system that is available in Britain now, and we are concerned with marketing products that are readily available."

Greeks had a name for it

WHEN MC Computers launched its new product Pi at Apple '82 in June, it billed it as "a customised version of the Apple for use in harsh industrial research and plant environments." However a month later it found to its cost just how harsh was that industrial environment.

The company had repackaged an Apple so that engineers could safely take it out of the confines of a clean laboratory and use it on the shop floor or in the process room. It had already sold five systems, worth £15,000, when Phillips Business Systems objected. It said use of the name Pi was an infringement of trademark and it threatened to take legal action unless MC Computers changed the name.

A Phillips spokesman told Windfall: "We own the Pye company and to avoid confusion in the electronics field we took out a defensive registration of all versions of the word Pye, including the Greek letter Pi. We have come to an amicable agreement with MC Computers. They didn't realise they had infringed our trademark and have agreed to change the name of their product."

Mike Young, managing director of MC Computers, confirmed that he has made an undertaking not to promote the name further and that a replacement name is being considered.

. . . and so has Dynatech

AND from required change to a voluntary one. The scientific program generator, The Next One, has been renamed Tech-Writer.

→

It is all part of the takeover of Microsystems of Guernsey by the multi-national Dynatech Group, which has holdings worth $70 million worldwide.

Guernsey is now the headquarters of Dynatech Microsoftware Publishing, and the former owner of Microsystems, Tony Thorne, is the new company's chairman and managing director. Mr Thorne, who predicts that program generators will be the major growth area of the '80s, said he thought the name The Next One was inappropriate.

The company has acquired world marketing and manufacturing rights for Tech-Writer, a program designed for programmers, engineers and scientists rather than for beginners. Its first product is C.O.R.P. (a beginners' program generator).

The marketing arrangements for that were confirmed officially last month, although Microsystems has been marketing it unofficially since the beginning of this year.

Franklin adverts make the hard sell in the States

An Apple for the teacher

ABBEYS Middle School in Milton Keynes is the proud new owner of a complete Apple II system – thanks to a winning competition entry by one of its pupils, 11-year-old Richard Doy. He was one of 340 schoolchildren hoping to win an Apple for the teacher in a competition organised by the Bletchley Computer Company at the Milton Keynes County Fair.

In an elimination contest 10 finalists were asked to write an essay on how their class or school would use an Apple. Windfall hopes to publish the winning essays next month.

Michelle Kalingray of Great Doddington Primary took the second prize of £250 towards the cost of an Apple, and Peter Hares, of Great Linford Primary, third prize of £100. The winning trio also received plaques. There were medals for the other finalists, and the finalists, with their teachers, have been invited for a day out at Apple (UK) next month.

..and a cheque

A DONATION from rock superstar Mick Jagger has been used to buy an Apple for Court School at Llanishen in Cardiff. The school's headmaster, Mr Ken Llewellyn, taught Mick Jagger in Dartford when the Rolling Stones singer was aged seven.

Said Mr Llewellyn: "After I saw the wonders that this sort of computer could do for slow learners I was determined to get one. I thought it was so important that I wrote to Mick to ask him for an autographed record that I could raffle.

"He wrote back immediately to say 'Never mind about the raffle, here is a cheque for £1,500'."

Mr Llewellyn only announced the donation recently, although the Apple has been installed at the school since the beginning of the year.

He told *Windfall:* "Actually I have had the Apple since before Christmas but I took it home with me first because I wanted to acquaint myself with it.

"I delayed my announcement of Mick's donation as a matter of diplomacy."

$50 million law suit

APPLE are involved in a legal wrangle in the United States. They recently filed a trademark infringement suit against Franklin Computer of New Jersey, and in reply Franklin filed an anti-trust suit against Apple.

Franklin denies that it has infringed on any Apple patents or copyrights in connection with the manufacture of its ACE 100 micro introduced earlier this year.

It claims instead that Apple is engaging in anti-competitive practices in an attempt to monopolise the personal computer market – and is seeking $50 million in damages from Apple as well as punitive damages and legal fees.

Help for Christopher

AN Apple can spell a whole new life for 20-year-old Christopher May of Bletchley in Buckinghamshire, a deaf and dumb spastic who can't hold a pen or write.

Christopher is intelligent, understands sign language and can use an electric typewriter, but his father claims that since leaving school two years ago Christopher has been dumped from the education system and forgotten.

Now there are plans to revolutionise Christopher's life by giving him an Apple computer. "It will open up a new world for him and keep him fully occupied," said Mr Roger Jefcoates, a consultant to the Neath Hill Professional Workshop in Milton Keynes.

Mr Jefcoates launched a fund-raising drive earlier this year, and already the appeal has raised half of the target. But raising the money is not the most difficult part of the project.

"We are in an area where machines are only just beginning to be applied, and training Christopher is going to be a problem," Mr Jefcoates said. "We're looking for volunteer tutors who have the right motivation and experience to lend a hand."

Enter Slot 8

IF like many readers you can't resist buying more and more of the ever more wonderful cards that parade through the advertising pages of Windfall, then you may well be getting the feeling that your Apple is getting rather overcrowded.

Why don't you use Slot 8?

That's the name of a product created by one of America's most inventive Apple support companies, Legend Industries. It's a card that plugs into Slot 7 and makes two slots available for peripheral use. So instead of the conventional Slots 0-7, your Apple now has Slots 0-8.

Jerry Janas, of Michigan-based Legend says that most peripheral cards made for the Apple will operate from the new Slot 8.

★ ★ ★

AS computers make business less complicated, so business titles conspire to make it more so. What, for example, might a European Human Resources Manager do to earn his daily bread? Does he monitor the entire continent's population, its needs and uses, hour by hour?

Or is he just one of Apple's personnel managers and known to his friends as Stefan Winsnes?

★ ★ ★

Keeping Tabs

THE software house Tabs, which specialises in accounting business systems, and which cut its teeth and made its name on the back of Apple, is now expanding to stand on its own feet in a multi-machine environment.

And its latest news release boasts about a "remarkable increase in Tabs software performance" using the latest MBasic compiler from Microsoft and the MSDOS operating system on the Sirius.

It says an operation which took 23 seconds on the Apple now takes just $1\frac{1}{2}$ seconds on the Sirius.

Tabs is even considering offering their customers a special trade-in price for their Apple or Pet in exchange for a new Sirius.

Neil Cornish, the company's accredited dealer sales network manager, stressed that this does not mean that it is moving away from the Apple, but he told *Windfall*: "If these other machines are going to take off due to good marketing and media coverage and enhanced capabilities, then we do not intend to be left behind.

"We don't want our current users to worry that if they do buy a different machine they will find they cannot use our software, so we are making the same type of software available for a wider range of leading machines.

"However our roots are with Apple. That is where we have done our development, and we have no intention of abandoning our Apple users. What we are saying is that they are our main market at the moment, but that may well change."

Mr Cornish said that in the past three months the Sirius has been taking an increasingly large slice of the market, although nothing to compare with the volume of Apple sales over the past two years, and that if the IBM personal computer was readily available that would also do well.

He added: "We would like to see a new Apple machine that can compete on the current market. We are a bit worried. Apple has built up a great dealer network, but it has to beware that its product doesn't fall behind."

New venue

THE first Apple board meeting to take place outside the United States was held at Shannon in Ireland last month. A company spokesman says there is no particular significance attached to the event, other than the fact that Apple is now an international company and will increasingly be holding board meetings at venues around the world.

Meanwhile John Otterstedt is acting as operations manager at Apple's plant in Cork pending the appointment of a new managing director to replace Alex Wrafter, who resigned in disagreement with the company's Cupertino headquarters.

Mr Otterstedt is no stranger to Cork. He was materials manager when the Cork plant was established in November 1980 before being appointed manager of Apple's Sunnyvale operations in the US.

Apple on Prestel

FOLLOWING its recent national advertising campaign on television, Apple has started advertising on Electronic Insight, a reference service on Prestel which reports on the fast-moving electronics scene and which is a focal point for telesoftware.

It has provided a complete list of dealers together with map locations, and details about hardware and software stocks and prices.

Bob Denton of Electronic Insight regards Apple's move as "just the beginning of a major new development". Already, he says, some Apple dealers have taken their own Prestel pages, and users can call them up for two-way communications and to place orders.

About 40 computer programs – mainly simple utilities and public domain software – have also been made available on Electronic Insight, and these can be downloaded onto an Apple provided it is equipped with an adaptor.

Best sell

DON'T mention it to your local newspaper, but all those pages of estate agents' advertisements which they carry each week might not actually sell any houses.

This was what Suffolk estate agent Brian Waghorn discovered when he bought an Apple and began analysing his sales enquiries. The program revealed that despite the large sums of money which were spent advertising in the local press, very few enquiries came from that source.

The next step was to axe the advertising budget completely, a step which had no effect whatsoever on sales and therefore, says Brian Waghorn, proved the effectiveness of the program.

A mailing/sorting programme enabled the company to reduce staff and with the £9,000 saved on advertising Brian bought another computer!

Not to worry . . .

FEARS that the second generation of Japanese 16 bit micros would sweep through the United States with the same success as their cars, seriously threatening the domestic personal computer market, are receding.

According to Business Week, Apple executives welcomed the arrival of Sony's much-heralded SMC-70 with three words – "a pleasant disappointment".

Apple are now convinced the only way the Japanese can make a significant inroad into the US market is with a major technological breakthrough.

MC Computers present Pi

— the industrialised Apple II

Pi is a customised version of the acclaimed Apple II Personal Computer for use in harsh industrial environments.

The system comprises a standard 48K Apple Computer, a sealed floppy disc drive, a controller and a mains/dc power unit housed in an industrial enclosure, to protect it from the problems of noise, vibration and dirt. User-definable front panel push buttons provide safe access to the computer. An optional QWERTY keyboard can be plugged into Pi for program development work or modifications.

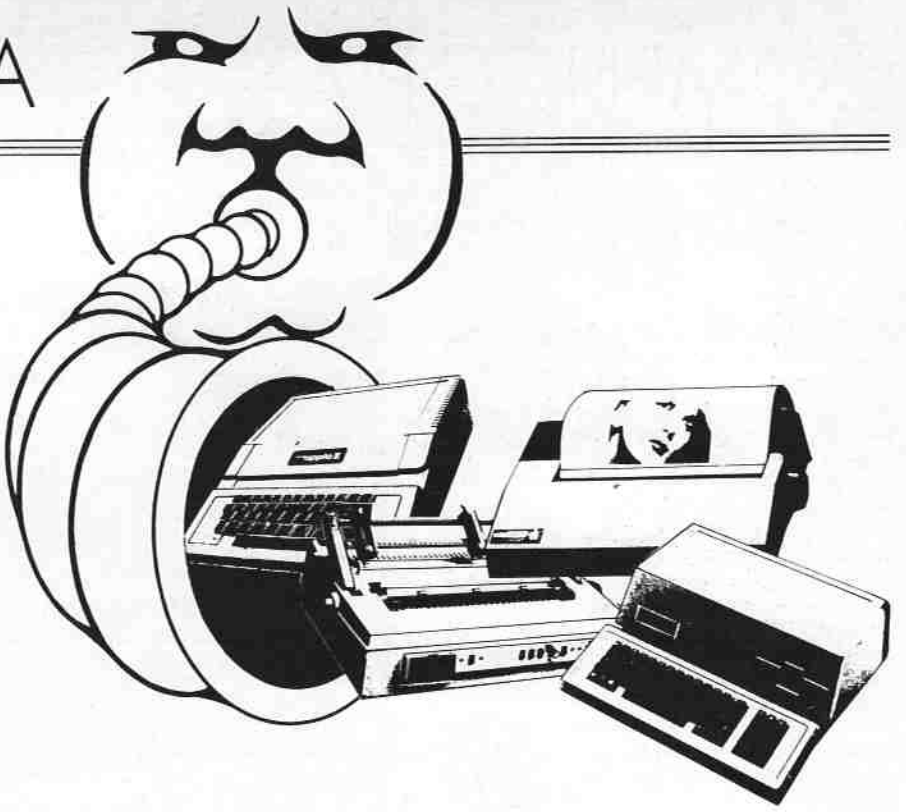
Another twin unit provides a 5 inch visual display unit and additional disc drive, and the two units are designed to link up for standard 19 inch mounting.

Pi is compatible with the full range of MC Computers' industry standard computer I/O cards for data acquisition and control applications.

MC COMPUTERS LIMITED, Park Street, Newbury, Berkshire RG13 1EA, England Tel: Newbury (0635) 44967 Telex: 946643 MICRO G

MC COMPUTERS

COMPUCOPIA



Writer picks up new tricks

SOME time ago Windfall reported on the Program Writer/Reporter, one of the earlier program generators which showed a good deal of promise. It has now been re-released with updated features to give it better screen handling facilities.

The sole UK distributor for the product is now Aset, who are using the package in-house to develop some of their own applications.

A limitation of the initial product was that the visual impact of the input screen was not very helpful to the average user. This has now been improved, and screens can now be developed very easily – and without breaking into the code produced – to contain reverse, blinking and half intensity messages, and cursor addressed prompts and input. This means that an input screen can be designed to suit the user, and validated data can be placed anywhere on the screen.

The Program Writer/Reporter runs on both DOS and CP/M-based Apples and produces code which is compact, sophisticated and fast. Programs which are produced – and a complete running debugged program can be turned out in 35 to 40 minutes – are completely free standing and do not need the generator to run them.

No programming knowledge or mathematical ability is required to generate basic programs, although the source code produced can be subsequently accessed by the experienced programmer to further enhance the programs.

Program Writer/Reporter costs £275 for the Apple II version, and £325 for other versions. The CP/M version requires Microsoft Basic 5.2 or later and at least 44k of memory to run. *Tel: 0704 43008.*

Handwriting no problem

IN A number of environments data has often to be handwritten onto data entry sheets before it is keyed into a computer. This process can now be condensed into one operation, using the hand character recognition terminal developed by Cadre Systems. This will accept handwritten characters, verify them and store them for eventual high speed transmission to a computer.

The terminal, based on a 4MHz Z80A microprocessor with 64k of RAM, up to 56k of ROM and an option of up to 48k of battery-backed CMOS RAM, is called Inforite. It is housed in an elegant slim unit, capable of taking A4 sheets of pre-designed format.

In conjunction with Moore Paragon, the stationery designers and suppliers, and Systematics International, suppliers of accounting packages for the Apple, the first systems have been pre-configured for capturing data for the Financial Controller rang of software. Cadre's next steps are to develop the interface for the general data capture market.

The use of a microprocessor-based terminal allows many functions to be incorporated, including a 2-line x 32 character display showing fields being entered, data as it is written, and error messages to identify and disallow erroneous entries. The processor also provides calculator functions to assist in the completion of forms. Extensions, subtotals, totals, VAT calculations and percentages can be computed automatically as the form is being produced and displayed for entry onto the forms.

Forms specifications, which can be easily defined with the system, can be stored to be used with different input documents.

Priced at £950 for the basic unit and £1,200 for a system with 48k of CMOS RAM, Inforite is designed to provide low cost secondary data terminals geared towards standard office and work environments. *Tel: 0285 68383.*

The Inforite terminal

Fancy a new kitchen?

A COMPREHENSIVE kitchen design, drawing, costing and ordering system has been developed by DMS Electronics. The system was originally developed for Kitchens International to be used in their retail showrooms, enabling designers to handle greater numbers of customers at less cost. DMS wrote the software, which has been under six months' trials. It is now being marketed jointly by both companies.

The system, which is based on a

→

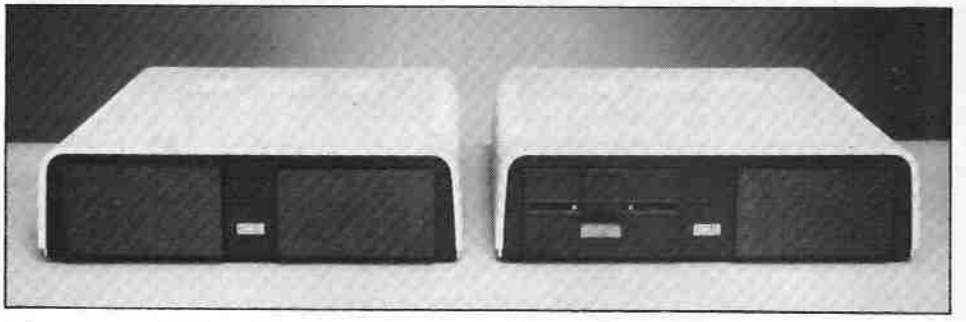
standard Apple II with three disc drives and either a printer from the Integral Data range to produce graphics output or a Silentype, enables designers to produce error-free kitchen plans more easily.

The plans can then be costed out using a variety of ranges from different manufacturers. An unpriced order form can be provided for the client to sign, plus working drawings for fitters and electricians, an order for the manufacturer using their own codes, and detailed plans showing the amount of wall and floor tiling required. Designs can be stored for future retrieval and amending, recosting and printing.

The package is based around machine code, giving maximum speed in performance and allowing for easy updating of data and easy creation of new ranges of products. Users need not, therefore, be programmers, or dependant upon the supplier of the package.

The whole package, including hardware, costs £5,300. *Tel: 0909 563918.*

New for the Apple from ICE



Backup from hard discs

ONE of the forerunners in low cost Winchester hard disc systems – ICE (Independent Computer Engineering) has produced two new products for the Apple. One is a hard disc system with capacities ranging from 3 to 42mbytes, and the other a tape backup to the Apple III's Profile 5mbyte disc.

The hard disc system, developed around Rodime's 5¼in Winchester drives, can be configured with one or two drives, or a mix of hard and floppy discs. It is available as a system consisting of four modules, the drive, controller, adaptor and power supply, and is housed in a neat case to complement the Apple. Software is available to support DOS, Pascal, CP/M and diagnostics.

ICE claim that the system is very reliable, with a mean time between failure of 10,000 hours, and say they also have a low cost networking system, to run several computers with the same drive. A 5mbyte system will cost around £1,800.

Also available from ICE is a new backup system for ProFile. Tape Streamer is a micro-controlled device which allows backup storage from hard discs on to cartridges with a maximum capacity of 20mbyte. Using intelligent formatter routines and error correcting facilities to provide high data transfer reliability, 20mbytes of data can be transferred in just over four minutes – a transfer rate of 90kbytes per second.

Tape Streamer is simple to install, plugging straight into an I/O slot in the Apple and is compatible with other disc systems besides ProFile. The cost is £1,600. *Tel: 07842 47271.*

Test before you buy

HOW much expensive software do you have on your shelves, lying there unused, in spite of the claims made for its suitability for your requirements? Very often the shortcomings in a particular piece of software, despite the best intentions of the dealer to provide you with what you want, are not evident after a short investigation and demonstration.

However, now you can minimise your losses, and try out some of the major packages available *before* you buy them. The Software Rental Bank allows the user to rent software for 7, 14 or 28 days, depending upon the terms of membership, and if it is found suitable, to convert the rental into a full sale agreement. If the software does not match the user's needs it can be returned with no further obligation.

The normal rental charge is 20 per cent of the list price of the software rented, and there is an annual subscription payable on top of that. An associate member, who can rent for seven days, deposits the full list price when he rents, and there is no limit to the value of software available. A full member pays a once only deposit of £50 against damage or loss, and can rent software up to the value of £500.

Corporate membership enables large corporations to evaluate software up to £1,000 in value, with a rental fee of 10 per cent per item. Their annual subscription is £500.

If a purchase is made the rental charge is waived. Software available includes programs for the standard Apple and systems running under CP/M. Members of the scheme will receive a periodical update of the software asset listing, and are encouraged to nominate new items for the Bank. *Tel: 0908 53491.*

Executive floppies . .

INMAC have introduced a personal carrying case for up to 50 floppy discs, the Enroute Case, which is designed to cushion discs from shock and protect them from dust, moisture or other contaminants.

Rigid internal dividers stop discs bending or warping in transit. The case measures 10x10x7½ in and is small enough to fit easily under an airline seat. The high impact resistant case can be locked and has a carrying handle. It costs £40. *Tel: 0285 67551.*

Where to buy your 7470

LAST month we talked about the Hewlett Packard 7470, a high speed intelligent plotter which allows multicoloured plotting on either plain A4 paper or overhead projector transparencies.

However, anyone who crammed the asking price of £1,021 into his pocket and went off to purchase the plotter from Datalink will have discovered an error in our article.

The HP 7470 is not being marketed by Datalink but by DBM Systems and Software. *Tel: 0272-214093.*

Snapshot analysis

AN interesting interface card with software is now on the market which could be quite useful for programmers who wish to get into programs to debug, develop or analyse them.

Snapshot is designed to take a complete map of a program in the process of running and, as its name implies, does so without altering or influencing the run.

It will interrupt a program and load it onto the card, along with all current data, memory pointers and parameters. The program can then be displayed on the screen, so that parameters and other strategies can be adjusted. If necessary, a Snapshot can be saved to disc and then the program can be resumed as though it had never stopped.

The monitor capabilities allow users to examine, modify, trace, single-step or dissassemble interrupted programs and examine video screen modes. This can be done repeatedly throughout a run, enabling previously unidentifiable faults to be traced.

Snapshot enables users to access any program running on a 48k Apple except those that require a Z80 card. It can provide back-up copies of discs, and Dark Star Systems, who market it, claim that the card could make bit copiers obsolete. Although programs which repeatedly access source disc while running could not be copied effectively, they could be analysed thoroughly by programmers with plenty of experience and then reconstructed. The card and relevant software supplied on a disc cost £95. *Tel: 01 900 0104.*

Streamlined paper flow

VERSAFORM can produce a whole range of business forms, update them and also produce reports. Its designed to streamline a company's manipulation of paper.

A whole range of applications have been defined as suitable for handling with the program, from retail/wholesale handling of quotes and estimates, bills of sale, invoices, purchase order management and sales analysis, to marketing, professional services with time and billing records, manufacturing-estimating production capacity and work flow scheduling, and many miscellaneous routines such as personnel records, time cards, service records, contractors estimates and time accounting.

Marketed by Pete and Pam, Versaform contains a large number of functions written in Pascal, and allowing management analysis and reporting, with the ability to sort and summarise data from multiple files, design and production of forms, validation of and processing of data, and printing forms.

It also contains a useful four place scratch pad calculator within the forms screen which can use numerical data from the form, perform calculations and place the result back within the form without disrupting the transaction. This is handy for on-the-spot discounts and mark ups, and for providing "what if?" transaction on samples without disturbing the final form data.

Versaform will run on floppy and hard disc systems, with a maximum number of forms on a hard disc of 30,000.A form can contain up to 50 items, or 4,000 data bytes. Ninety nine entries per item can be held with table lookups, similarly with list and range checks, and calculations can have six arguments per item calculated.

As if all that is not enough, Versaform also comes with a Pascal interface – a programmer's access method. This is a set of procedures and functions which enable data to be moved between Versaform and Pascal files and custom applications to be made through Pascal programs.

Up to three Versaform files can be accessed simultaneously on the Apple II, enabling complex operations to be set up. Both systems are available on the Apple III.

Applechat with SIMcard

A VERSATILE serial addition to the Apple is the SIMcard (Stockport Serial Interface Modem) which allows communication between two Apples.

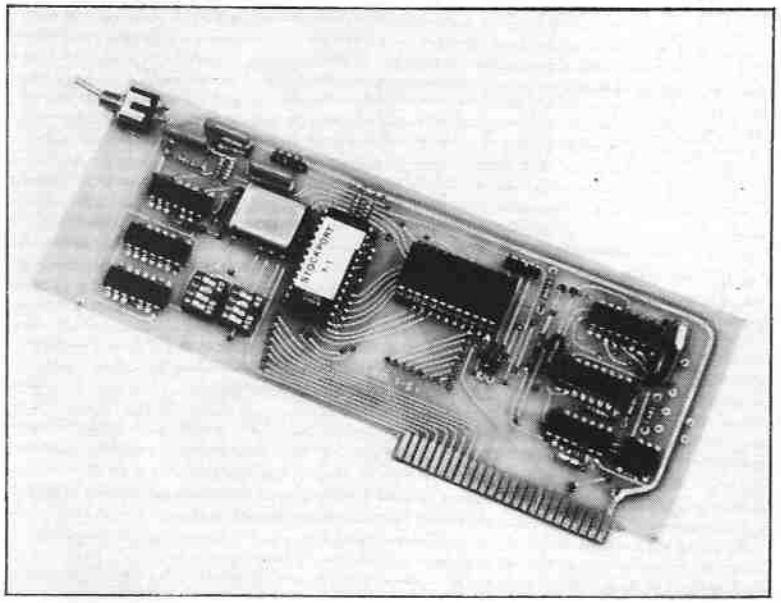
The card's data I/O consists of two user ports, one a standard V24 compatible port and the other an on-board modem.

The manufacturers, Stockport Research and Development, are also developing an acoustic coupler for use with this modem.

Firmware on the SIMcard is switch selectable between the standard communication mode (allowing full or half duplex, remote or terminal operation and also a facility to send a break character) and a program exchange mode. This allows the exchange of programs between Apples and, with software parameter modifications, program exchanges with other micros.

Both modes allow a choice of send and receive data transfer rates ranging from 300 Baud for standard data transfer to 1200 and 75 Baud.

The latter two rates are used by Prestel, so with the future development of appropriate modems the SIMcard (which costs £86) would enable the Apple to act as either a Prestel terminal or else a Prestel-style database. *Tel: 061-430 6277.*



SIMcard lets Apple talk to Apple

COMPUCOPIA

Fast transfer routine

AN intelligent fast parallel buffer card which takes the waiting out of using printers has been brought out by Computopia. A fast transfer routine, which sends data to the Turbo-card at machine code speed, handing back control to the Apple almost immediately, eliminates many of the instances where Apples are held up waiting for slower printers to finish their work.

Using the 6504 processor to control the transfer, up to 5.5k of data can be transferred in seconds, and a graphics dump to an MX-80 can be achieved in a quarter of the time it normally takes. The card operates within monitor, Basic, CP/M and Pascal, and includes a 4k Eprom to store firmware to simplify the dumping of graphics, eliminating pokes and so on.

Priced at £149, the Turbo-card, which will soon also have firmware for handling simple, fast mailshots, enables users to let the printer take its natural course while they get back to work on the Apple. *Tel: 0525 376600.*

Plug-in printer buffer

A UNIVERSAL printer buffer that can be used with the Apple and with parallel printers is now available in the UK through Bluedata Limited. MicroFazer, which is manufactured by Quadram Corporation of America, is a parallel in/parallel out data buffer which uses standard Centronics signals. It can draw power from many printers when necessary although a separate low voltage power supply (9 volt, 500 ma.) is available, and standard calculator or battery chargers can be used.

Controlled by a custom LSI chip, MicroFazer receives data from the Apple at up to 4,000 characters a second and transfers it as rapidly as the printer can handle it.

Buffering of 8k, 16k, 32k or 64k is available in the four models of MicroFazer, with prices varying from £145 for the 8k version to £225 for the 64k. Each unit is packaged in a small metal case which can be attached directly to the input port of the Epson, for example, so that the user simply removes the existing printer cable and plugs it in to the MicroFazer. Most other Centronics compatible printers can be attached by using an adaptor cable. Tel: 01-204 9127.

MicroFazer . . . universal print buffer

Aussie video display card

AN Australian-developed video display card for the Apple, Vision-80, is being distributed in Britain by Pynwon Computer Services. It gives an 80-column by 24 line display and allows upper and lower case with a visual shift lock indicator. Characters are formed in a large 9 x 11 dot matrix grid, including three dot descenders on lower case.

The card, which costs £195, works with all languages available for the Apple, and reacts to standard Applesoft commands associated with manipulating the 40-column text window. It must be placed in Slot 3.

Vision-80 can also be used with an acoustic modem and a communications card to make an intelligent terminal that can operate up to 1,800 bits a second. With the communication option the board can communicate with DOS allowing files to be saved and transmitted and its use enables the Apple to control both itself and a remote computer, provided the latter is another Apple with a Vision-80 board. *Tel: 01-884 0879.*

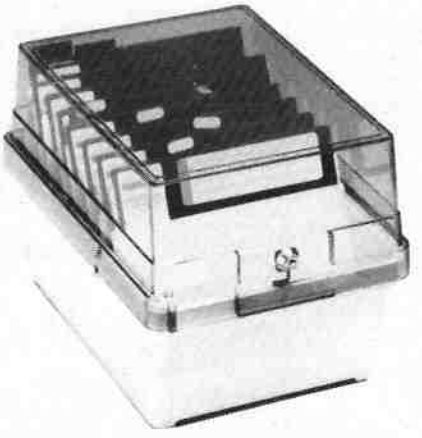
Zounding board

'ZOUNDS! Here comes another board, this time to produce rich musical and sound effects to go with Apple graphics.

Zapple, from Meekrose, enables sound to be created as easily as shape tables and stored as sound tables, reproducible with simple Basic statements to provide yet another device to bring the Apple alive.

Zapple boards contain the AY-3-8910 programmable sound generator chip, software in an on-board Eprom, and a volume controlled audio amplifier which can connect to the Apple speaker. In addition to this, the number of voices can be extended from three to nine by plugging in two more PSGs and the system can be connected to an external speaker.

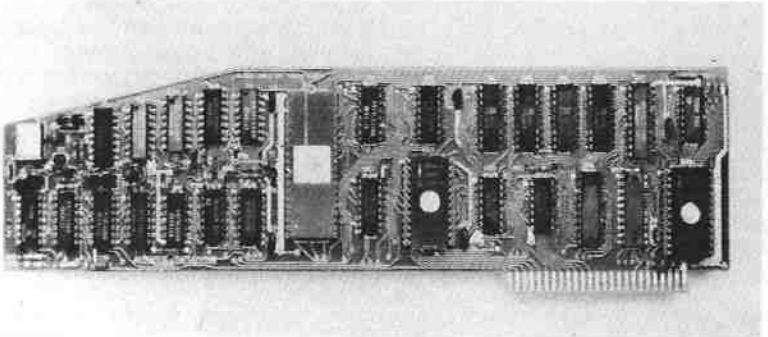
Zapple boards, costing £65, can be run from disc or tape systems, They come with complete documentation, including full source listings of machine code programs.*Tel: 0525 370621.*



Safe storage

TWO storage trays, one for 5¼in and the other for 8in floppy discs, are being marketed by Shannon Datastor. They are made of high impact plastic with a smoked Perspex lid and are lockable. Both have room for up to 90 discs and are supplied with divider plates and self-adhesive title strips for indexing.

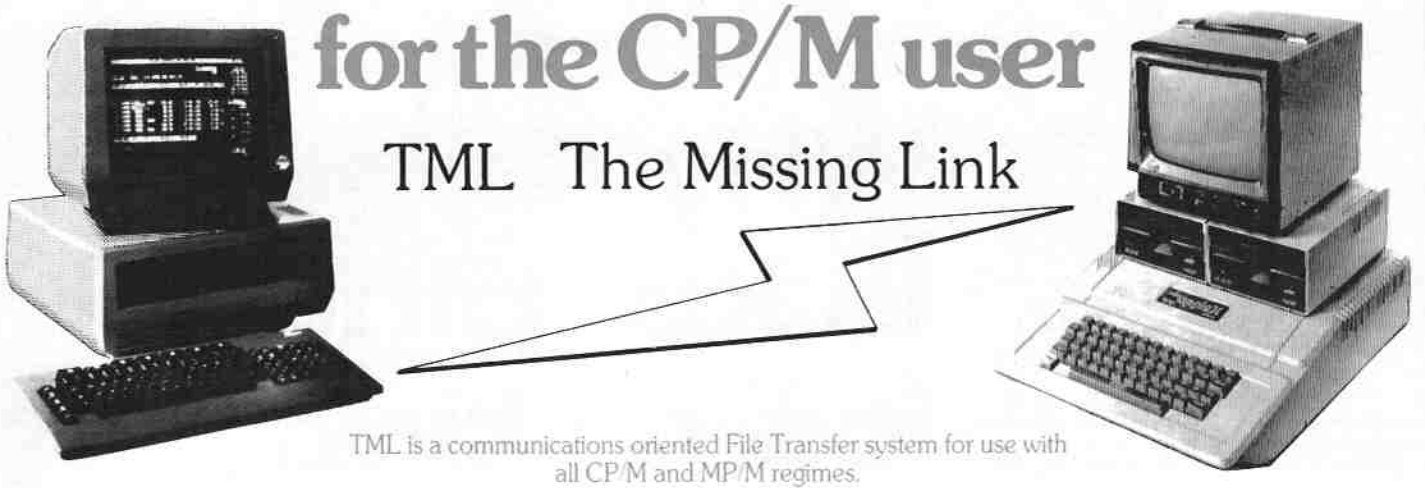
The trays cost £19.95 for the 5¼in version and £29.95 for the 8in version. *Tel: 01-650 4818.*



Vision - 80 . . . nice one from Australia

WITH CP/M IN MIND

Two new products from GB for the CP/M user



TML The Missing Link

TML is a communications oriented File Transfer system for use with all CP/M and MP/M regimes.

Ordinarily CP/M File movement is handled by the PIP program. However PIP is very restrictive in the way files can be moved between *different* microcomputers, and usually requires special port drivers to be patched into PIP.

The large number of CP/M based computers, coupled with a wide range of languages and applications, demands an increasing degree of portability and file interchange between those computers.

TML provides this in a simple but most effective way and is currently available for combinations of Apple II, EXIDY SORCEROR, ICL PERSONAL, MICROMATION, ACT SIRIUS I, and RAIR 3/30. Soon to be available on SUPERBRAIN, TRS-80 and other major CP/M computers.
Costs just £99 (plus P&P and VAT).

TURNKEY

apple

TURNKEY is a software concept enabling the Apple II user to communicate with applications *in plain English*, translating information into the form recognised by CP/M.

CP/M has become the most "popular" microcomputer based operating system mainly because it has provided an adequate applications development base. However, CP/M is notorious for its relatively "unfriendly" means of communication, producing obscure coded messages which are often meaningless to the end-user.

The TURNKEY concept completely conceals the CP/M system from the end-user whilst still permitting access to all CP/M facilities such as disk copying, erasing, renaming and moving files between disks, etc.

TURNKEY is of enormous value for Database systems, Word Processing, Accounting Systems - indeed all business applications. Software Houses using TURNKEY can deliver systems which can be installed instantly with no need for the user to learn CP/M first. Available currently for Apple II, ACT SIRIUS I, and EXIDY SORCEROR at only
£69 (plus P&P and VAT).

GB Computer Products Limited

GB Computer Products,
14 Greenwood Grove, Winnersh,
Wokingham, Berkshire, RG11 5LH.
Tel: 0734 786635 or 791678.
Telex 847783 GDB CSG

TML, APPLE II, CP/M & MP/M are trademarks of Busisoft, Apple Computer Inc and Digital Research Inc respectively.

Why Apple is keeping its options up

By DEREK MEAKIN

IS the dramatic success story of record-smashing Apple II coming to an end? Are the death wishes of its competitors about to turn from wishful thinking into reality?

Listening to the considered musings of Tom Lawrence, Apple's top man in Europe, you might be forgiven for fearing the worst. Yes, he admitted, the growth rate of Apple II had slowed down. Fewer were now being shipped. Sales were declining.

But what about the Apple III? Wasn't there a brighter picture here? Well, not quite, he was forced to confess. Despite all the promise of the III, sales were certainly not growing as fast as they would like them to.

So what about the long-heralded Apple IV – or whatever name it was going to be called. Wasn't this going to give sales a shot in the arm? He shrugged his shoulders. Perhaps. But not yet. It wasn't due until next year.

It sounded like a classic tale of woe. But then Tom Lawrence's mischievous eyes sparkled. As though he'd nearly forgotten to mention it he added, almost apologetically: "You might like to know that our summer promotion has been quite a boom. In fact, sales in June hit worldwide records. And, you know, in money terms we're still growing at a very, very satisfactory rate."

That is the paradox of Apple, and of the micro business in general. In the middle of a boom you've got to be nervously apprehensive of what the future might bring.

Such is the rapidly-changing nature of this unpredictable industry that you have to keep the adrenalin constantly coursing through the corporate veins. You must be forever worried about what the opposition is up to.

Above all, you don't talk about your next move until you are ready to make it. Which is why Tom Lawrence refused to be drawn about what new goodies Apple has tucked up its sleeves, and wouldn't admit that names like Lisa and Macintosh held any special relevance.

But one thing he was quite certain of was that "significant changes" would take place within the next six to 12 months. "We can see considerable growth and considerable opportunities – far more than most people believe possible," he said.

He also produced figures to back up his optimism. Projected worldwide sales of personal computers in the $500 to $5,000 price range were all set to rise from $3 billion this year to $5 billion in 1984. But in the same period sales in the European market were expected to jump from $100 million to a massive $1.5 billion.

Tom, who entered the big business jungle after graduating in both computer science and mathematics at the University of Michigan and later picked up a master's degree in computer sciences at Stanford, showed how much he enjoyed juggling with figures as he gave a probing analysis of trends in the European marketplace.

Last year there were a total of 1,100 retail outlets selling Apples in the USA, and each sold an average of 10 units a month. But in Europe, with 200 more outlets, each sold an average of just 2.8 units a month.

"One of the limiting factors we are facing is that dealers in Europe are under-capitalised and under-financed," he said, and added confidently: "But we hope to have an answer to this in the next year or two."

There was also a considerable difference in the make-up of users on either side of the Atlantic. Over here, 50 per cent of Apples go into small businesses, but only 20 per cent in the USA. And in the States 15 per cent went into the home/hobby category, compared to just 5 per cent in Europe.

"I suppose this shows one of the main characteristics of the European market as against that in the USA," he said. "Over there it's not uncommon for someone to walk into a store and buy an Apple on the spot and take it home, not really knowing what he is going to use it for. Impulse buying to this extent is virtually unknown in Europe."

Naturally, he likes to think of Apple taking a predominant share of the European market, but it has still not shaken Commodore from its perch at the top of the tree. Not quite.

Commodore had 38 per cent of European sales in 1980. This dropped to 32 per cent last year, and the figure is expected to stay the same this year Apple's figures rose from 17 per cent in 1980 to 26 per cent last year, and should reach 29 per cent this year. Tandy, however, are on the slide – from 10 per cent in 1980 to 8 per cent last year and will be lucky to hold 7 per cent this year.

Despite the non-appearance of a new generation of computer to spearhead its activities, the British end of Apple is gearing up for a vigorous marketing campaign. Managing director Peter Cobb is recruiting some highly experienced lieutenants, like his new sales director Keith Hall, who he wooed from the top sales job with Commodore.

Peter Cobb is well aware the fight will not be an easy one. "The market is changing rapidly, and change brings its own problems," he said. "The shops are being flooded with new computers, all trying to compete with Apple.

"The buyer is assaulted at all levels – technical and commercial – and he is desperate for help to define just what he needs to solve his computing problems.

"Which manufacturer is he to believe? How does he assess that what he's offered is really what he needs? He knows he has to get a micro to be more effective in his job, but he is also aware that he is going to need support once he has bought it.

"This is what we can offer through our dealer network. The task of the dealer is not only to help the buyer to buy, but also to help him look after it once he's bought it, and this aspect cannot be emphasised too strongly."

But in this tough world dealers were vulnerable, and Peter said there were many who wouldn't stay the course. But were manufacturers in any safer position?

Not so, said Tom Lawrence. "I'd say

"We can see considerable growth and considerable opportunities – far more than most people believe possible." – *TOM LAWRENCE*

"The buyer is desperate for help to define just what he needs to solve his computing problems." – *PETER COBB*

its corporate sleeve

right now there's a serious oversupply of them, and in the next year we'll see a dramatic shakeout," he forecast. "Only six or seven companies at most will stick the course."

Tom has three ingredients for success. To build up successful sales channels, to create effective markets, and above all to encourage the active commitment of the software community – the people who supply the applications the user wants.

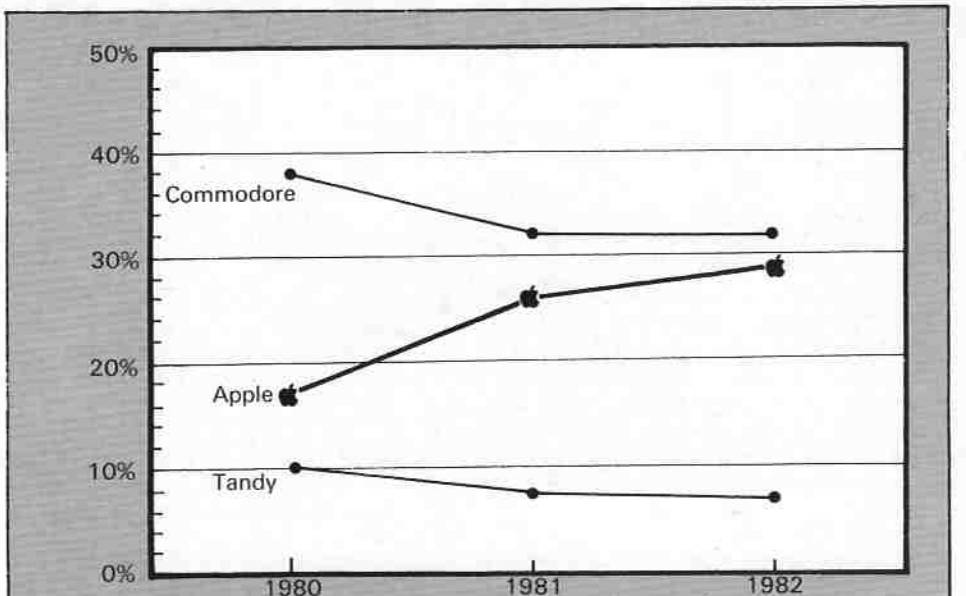
In fact he cited the building up of a cottage industry around Apple as being one of the keys to the company's success. He claimed that because of Apple more than 5,000 new hardware and software companies had been formed in the last five years – nearly 4,000 in the USA and the rest in Europe. That, in turn, has meant the creation of around 36,000 new jobs.

Apple have a very clearcut European strategy. One is to Europeanise their products – a vital necessity in non-English speaking countries, where users are still forced to use English as their programming language. Another is a concentrated campaign to find out what kind of support products different categories of user would most like to have, and providing them with the answers.

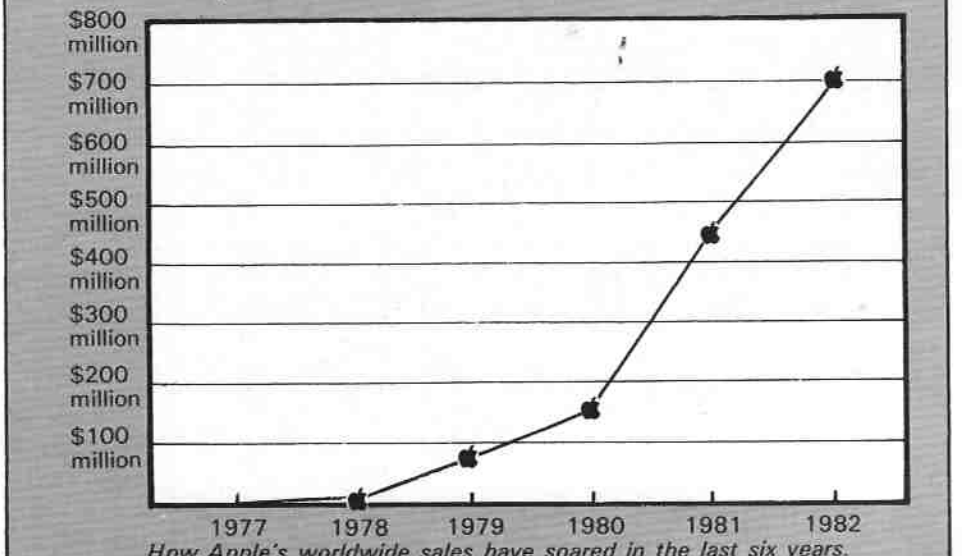
Worldwide sales of Apples have skyrocketed from $80 million in 1979 to $150 million in 1980, $450 million in 1981 and are expected to touch $700 million by the end of this year.

And although it is inevitable that individual prices will drop dramatically with the arrival of new computers on the market, Tom Lawrence and Peter Cobb are thoroughly convinced that Apple's yearly profit figures will continue to shoot upwards.

It was only last year, because of its remarkable rags-to-riches success story, that financial writers started calling Apple the darling of Wall Street. Listening to its European commanders plotting the next shots in their marketing battle, it's a tag the company is determined to hang on to.



The Big Three's share of the European micro market



How Apple's worldwide sales have soared in the last six years.

More room on the disc without DOS

This short utility program is designed to initialise a disc under DOS 3.3. The disc cannot be used to boot from and will have no image of DOS. The advantage to the user is the increased storage on the disc – this is increased by approximately 10k.

The listing is in two parts. The first is a program in Applesoft which sets up the system. The second is a machine code program. The listing for this program is given as a memory dump of the total image and an assembly listing of the program section.

The machine code section is divided up as follows:

1. $2000-$206E is the program section. This section uses the RWTS subroutines from DOS to initialise the disc, write a volume table of contents and a catalog section, and then link the remaining catalog sections together.
2. $206F-$2072 is the device characteristic table required by DOS for disc II.
3. $2073-$2083 is the IOB table for the RWTS routine. This table is modified during program execution.
4. $2100-$21FF is a modified image of the volume table of contents freeing the first three tracks of the disc.
5. $2200-$22FF is a catalog segment advising the user there is no DOS on the disc. This buffer area is subsequently cleared and set up as a linking image of each of the remaining catalog sections.

The basic program I have called 'New Disc'. The binary section when typed in should be saved as:

BSAVE NEW.CODE,A$2000,L$300

N. Perkinson

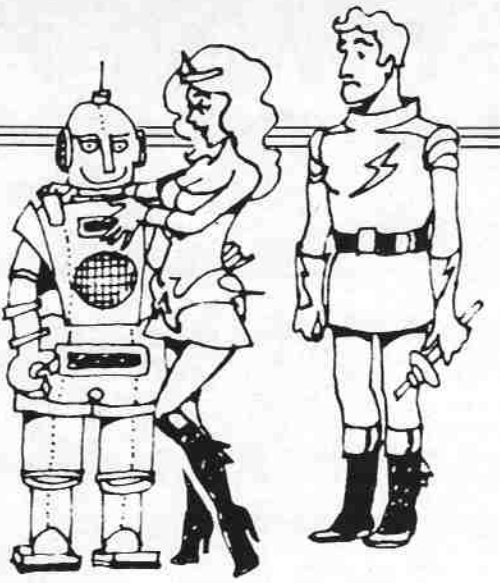
```
10  HOME : VTAB 4
20  PRINT "NEW DISK!"
30  PRINT : PRINT "THIS UTILITY P
    ROGRAM ENABLES A DISK"
40  PRINT "TO BE INITIALISED WITH
    OUT AN IMAGE"
50  PRINT "OF DOS GIVING 10K BYTE
    S INCREASE IN"
60  PRINT "DISK CAPACITY."
70  PRINT : PRINT "IF THIS ROUTIN
    E DOES NOT WORK THEN"
80  PRINT "RE-BOOT DOS AND RERUN..
    ..............."
90  PRINT  CHR$ (4);"BLOAD NEW.CO
    DE"
100 VTAB 15: PRINT "INSERT DISK
    TO BE INITIALISED"
110 PRINT "IN DRIVE 1. (PRESS AN
    Y KEY)"
120 GET A$
130 CALL 8192
140 HOME
150 PRINT : PRINT "REMOVE DISK A
    ND INSERT SYSTEM DISK"
160 PRINT "TO REBOOT DOS........
    ......."
170 PRINT : PRINT "    (PRESS ANY
     KEY) ";
180 GET A$
190 PR# 6
```

```
*2000.22FF

2000- A9 20 A0 73 20 D9 03 A9
2008- 11 8D 77 20 A9 00 8D 78
2010- 20 A9 02 8D 7F 20 A9 00
2018- 8D 7B 20 A9 21 8D 7C 20
2020- A9 20 A0 73 20 D9 03 A9
2028- 0F 8D 78 20 A9 00 8D 7B
2030- 20 A9 22 8D 7C 20 A9 20
2038- A0 73 20 D9 03 A9 00 A2
2040- 00 9D 00 22 E8 F0 03 4C
2048- 41 20 A9 11 8D 01 22 8D
2050- 77 20 A2 0E BE 78 20 CA
2058- F0 13 8E 02 22 8E 6E 20
2060- A9 20 A0 73 20 D9 03 AE
2068- 6E 20 4C 54 20 60 01 00
2070- 01 EF D8 01 60 01 00 11
2078- 01 6F 20 00 22 00 00 02
2080- 03 00 60 01 00 00 00 00
2088- 00 00 00 00 00 00 00 00
2090- 00 00 00 00 00 00 00 00
2098- 00 00 00 00 00 00 00 00
20A0- 00 00 00 00 00 00 00 00
20A8- 00 00 00 00 00 00 00 00
20B0- 00 00 00 00 00 00 00 00
20B8- 00 00 00 00 00 00 00 00
20C0- 00 00 00 00 00 00 00 00
20C8- 00 00 00 00 00 00 00 00
20D0- 00 00 00 00 00 00 00 00
20D8- 00 00 00 00 00 00 00 00
20E0- 00 00 00 00 00 00 00 00
20E8- 00 00 00 00 00 00 00 00
20F0- 00 00 00 00 00 00 00 00
20F8- 00 00 00 00 00 00 00 00
2100- 04 11 0F 02 00 00 FE 00
2108- 00 00 00 00 00 00 00 00
2110- 00 00 00 00 00 00 00 00
2118- 00 00 00 00 00 00 00 00
2120- 00 00 00 00 00 00 00 7A
2128- 00 00 00 00 00 00 00 00
2130- 14 01 00 00 23 10 00 01
2138- FF FF 00 00 FF FF 00 00
2140- FF FF 00 00 FF FF 00 00
2148- FF FF 00 00 FF FF 00 00
2150- FF FF 00 00 FF FF 00 00
2158- FF FF 00 00 FF FF 00 00
2160- FF FF 00 00 FF FF 00 00
2168- FF FF 00 00 FF FF 00 00
2170- FF FF 00 00 FF FF 00 00
2178- FF FF 00 00 00 00 00 00
2180- 3F FF 00 00 1F FF 00 00
2188- 1F FF 00 00 FF FF 00 00
2190- FF FF 00 00 FF FF 00 00
2198- FF FF 00 00 FF FF 00 00
21A0- FF FF 00 00 FF FF 00 00
21A8- FF FF 00 00 FF FF 00 00
21B0- FF FF 00 00 FF FF 00 00
21B8- FF FF 00 00 FF FF 00 00
21C0- FF FF 00 00 00 00 00 00
21C8- 00 00 00 00 00 00 00 00
21D0- 00 00 00 00 00 00 00 00
21D8- 00 00 00 00 00 00 00 00
21E0- 00 00 00 00 00 00 00 00
21E8- 00 00 00 00 00 00 00 00
21F0- 00 00 00 00 00 00 00 00
21F8- 00 00 00 00 00 00 00 99
2200- 00 11 0E 00 00 00 00 00
2208- 00 00 00 11 01 00 88 88
2210- 88 88 88 88 A0 A0 A0 A0
2218- A0 A0 A0 A0 A0 A0 A0 A0
2220- A0 A0 A0 A0 A0 A0 A0 A0
2228- A0 A0 A0 A0 01 00 11 01
2230- 00 88 88 88 88 88 88 88
2238- 20 20 20 14 08 05 12 05
2240- 20 09 13 20 0E 0F 20 20
2248- 20 20 20 20 A0 A0 A0 01
2250- 0C 11 01 00 88 88 88 88
2258- 88 88 88 20 20 09 0D 01
2260- 07 05 20 0F 06 20 04 20
2268- 0F 20 13 20 20 20 20 A0
2270- A0 A0 01 00 11 01 00 88
2278- 88 88 88 88 88 88 20 20
2280- 20 0F 0E 20 14 08 09 13
2288- 20 04 09 13 0B 20 20 20
2290- 20 20 A0 A0 A0 01 00 11
2298- 01 00 88 88 88 88 88 88
22A0- 88 20 31 35 30 20 0B 02
22A8- 19 14 05 13 20 13 14 0F
22B0- 12 01 07 05 20 A0 A0 A0
22B8- 01 00 11 01 00 88 88 88
22C0- 88 88 88 88 A0 A0 A0 A0
22C8- A0 A0 A0 A0 A0 A0 A0 A0
22D0- A0 A0 A0 A0 A0 A0 A0 A0
22D8- A0 A0 A0 01 00 11 01 00
22E0- 88 88 88 88 88 88 88 A0
22E8- A0 A0 A0 A0 A0 A0 A0 A0
22F0- A0 A0 A0 A0 A0 A0 A0 A0
22F8- A0 A0 A0 A0 A0 A0 01 00
```

```
SOURCE FILE: NEW1
03D9:              1 RWTS     EQU  $03D9
2100:              2 VTOC     EQU  $2100
2200:              3 CAT1     EQU  $2200
2201:              4 TRPNT    EQU  CAT1+1
2202:              5 SCPNT    EQU  CAT1+2
0002:              6 COMMW    EQU  $02
2000:              7 START    EQU  $2000
--- NEXT OBJECT FILE NAME IS NEW1.OBJ0
2000:              8          ORG  START
2000:A9 20         9          LDA  #<IOB
2002:A0 73        10          LDY  #>IOB
2004:20 D9 03     11          JSR  RWTS       ;INIT DISK
2007:A9 11        12          LDA  #$11       ;TRACK
2009:8D 77 20     13          STA  TRACK
200C:A9 00        14          LDA  #$0        ;SECTOR VTOC
200E:8D 78 20     15          STA  SECTOR
2011:A9 02        16          LDA  #COMMW     ;RESET IOB COMMAND
2013:8D 7F 20     17          STA  COMMAND
2016:A9 00        18          LDA  #>VTOC     ;VTOC IMAGE
2018:8D 7B 20     19          STA  BUFLO
201B:A9 21        20          LDA  #<VTOC
201D:8D 7C 20     21          STA  BUFHI
2020:A9 20        22          LDA  #<IOB
2022:A0 73        23          LDY  #>IOB
2024:20 D9 03     24          JSR  RWTS       ;WRITE VTOC
2027:A9 0F        25          LDA  #$F        ;CATALOG
2029:8D 78 20     26          STA  SECTOR     ;SECTOR 1
202C:A9 00        27          LDA  #>CAT1     ;CATALOG IMAGE
202E:8D 7B 20     28          STA  BUFLO
2031:A9 22        29          LDA  #<CAT1
2033:8D 7C 20     30          STA  BUFHI
2036:A9 20        31          LDA  #<IOB
2038:A0 73        32          LDY  #>IOB
203A:20 D9 03     33          JSR  RWTS       ;WRITE CAT1 IMAGE
203D:A9 00        34          LDA  #$00       ;STORE CHARACTER
203F:A2 00        35          LDX  #$00       ;SET COUNTER
2041:9D 00 22     36 LOOP     STA  CAT1,X     ;CLEAR LOCATION
2044:E8           37          INX              ;INCREMENT COUNTER
2045:F0 03        38          BEQ  CONT       ;COUNT=0 CONTINUE
2047:4C 41 20     39          JMP  LOOP       ;ELSE LOOP TO CLEAR BUFFER
204A:A9 11        40 CONT     LDA  #$11       ;CATALOG TRACK POINTER
204C:8D 01 22     41          STA  TRPNT      ;STORE IN CATALOG BUFFER
204F:8D 77 20     42          STA  TRACK      ;STORE IN IOB
2052:A2 0E        43          LDX  #$0E       ;SECTOR POINTER
2054:8E 78 20     44 LOOP1    STX  SECTOR
2057:CA           45          DEX              ;DECREMENT SECTOR POINTER
2058:F0 13        46          BEQ  CONT1      ;IF X=0 CONTINUE
205A:8E 02 22     47          STX  SCPNT      ;SET SECTOR POINTER IN CATALOG BUFFER
205D:8E 6E 20     48          STX  XBUF       ;STORE X REGISTER
2060:A9 20        49          LDA  #<IOB
2062:A0 73        50          LDY  #>IOB
2064:20 D9 03     51          JSR  RWTS       ;WRITE CATALOG SECTOR
2067:AE 6E 20     52          LDX  XBUF       ;RESTORE X REGISTER
206A:4C 54 20     53          JMP  LOOP1
206D:60           54 CONT1    RTS              ;RETURN
206E:00           55 XBUF     DFB  $00        ;X REGISTER BUFFER
206F:00           56 DEVCHAR  DFB  $00        ;DEVICE CHARACTERISTIC TABLE
2070:01           57          DFB  $01
2071:EF           58          DFB  $EF
2072:D8           59          DFB  $D8
2073:01           60 IOB      DFB  $01        ;IOB BLOCK
2074:60           61          DFB  $60
2075:01           62          DFB  $01
2076:00           63          DFB  $00
2077:00           64 TRACK    DFB  $00
2078:00           65 SECTOR   DFB  $00
2079:6F           66          DFB  )DEVCHAR
207A:20           67          DFB  (DEVCHAR
207B:00           68 BUFLO    DFB  $00
207C:00           69 BUFHI    DFB  $00
207D:00           70          DFB  $00
207E:00           71          DFB  $00
207F:04           72 COMMAND  DFB  $04
2080:00           73          DFB  $00
2081:00           74          DFB  $00
2082:60           75          DFB  $60
2083:01           76          DFB  $01

*** SUCCESSFUL ASSEMBLY: NO ERRORS
```



Handle with care, suffering from battle fatigue

By PETER GEE

IF this month's offering be rather laboured blame the fingers, not the brain. A weekend's pounding at the Apple keys in a bid to outwrite a whole shoal of nasties encountered in no less than four strictly physical arcade-type games plays havoc with the muscles. And leaves exposed as myth all pretentions to razor sharp reflexes. Sad.

However, excuses made, its battle, first with Bandits by Sirius. This is very much indebted to Space Invaders, and consequently is great fun. You move your ship right and left on the base line and use two more controls to energise a shield – which rapidly fades away unless replenished – and fire your armaments.

The attackers, of which there are six varieties, stack up on the left of the screen before having at you, so it seems good tactics to start each foray by positioning your ship on the left also and firing like made ready for the enemy pressing his attack. This enabled me to raise my score from the puerile to the mundane.

Bandits has 28 levels of play, at each of which a different group of items to be plundered by yet another combination of the ungodly is displayed on the right of the screen. Points are scored for each supply item remaining after obliterating all the attacking force, and the points awarded are boosted as the player progresses from level to level.

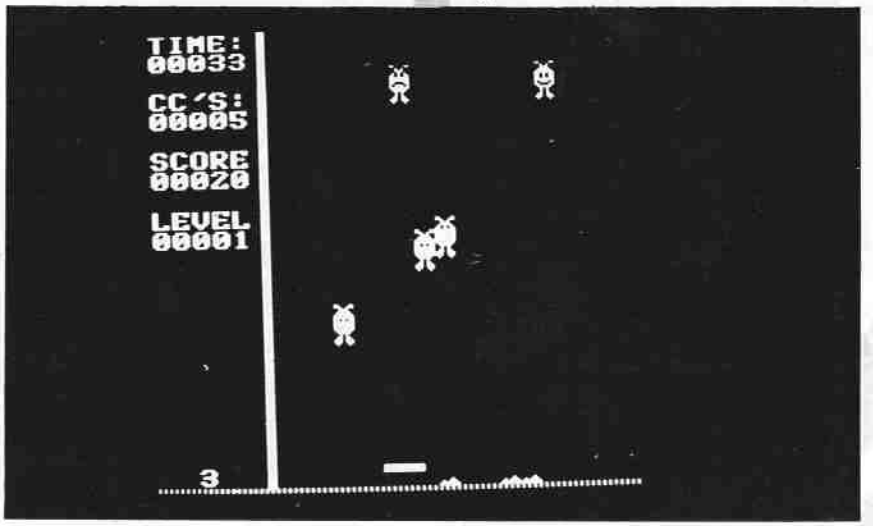
I like Bandits because it panders to the not-too-fleet-of-finger. And I am told by my fast cat friends that the higher levels of play are enough to make your hair curl. So everyone should be satisfied.

It requires an Apple II or II Plus with 48k and one disc drive, boots directly with either 13 or 16 sector controller and can be played with keyboard, paddle or joystick.

Suicide, by Piccadilly Software, was almost the death of me. It looks so confoundedly simple. You have these gormless little creatures floating down to ground level to immolate themselves with a squishy thud. And you, their saviour, have only to interpose a bar of light between them and ground level and they are saved, to float gently aloft.

And try again later.

The trouble is that your net, for want of a better description, moves exceedingly



The Bandits battleground, above, shows enemy forces gathering left, while a rather fuzzy (camera, not program) spaceship on the base line fires a missile. Below, Suicide in action. The white bar at the bottom bounces would-be suicides back. The small blobs are ones who made it.

GAMESMANSHIP

Fly Wars
Produced by Sirius. Obtainable from SBD.

Swashbuckler
Produced by Datamost. Obtainable from SBD.

Bandits
Produced by Sirius Software. Obtainable from SBD.

Suicide
Produced by Piccadilly Software. Obtainable from SBD and Pete and Pam.

● *SBD: 15 Jocelyn Road, Richmond TW9 2TY. (tel: 01-948 0461).*

● *Pete and Pam: Waingate Close, Rossendale, Lancs. (tel: 0706 227011).*

fast. Using the keyboard *(you have the usual paddle, etc, options),* left and right arrows perform the appropriate functions but you have to press the space bar to stop movement once it has started. Releasing the arrow is not enough. And that is where the mad button-jabbing comes in as you try to inch the net under a would-be suicide while keeping an eye on the others inexorably descending.

The game is played to a time limit *(which is just as well),* and there are five degrees of difficulty. In addition, the program throws in a few jokers – for instance, you must save the suicide who descends upside down, but not the one with an antenna missing. Points are amassed for creature saved, and subtracted for misses. I'm aiming for minus a million. Suicide will happily take over Apple II and II Plus with 48k and DOS 3.3 or 3.2 as well as Apple III.

Of the games reviewed this month I liked Swashbuckler by Datapost the best. Not that I performed particularly well either. I think it must be the hi-res graphics which make a fight to the death between Black Hearted Gee and the rest of the pirate horde so credible.

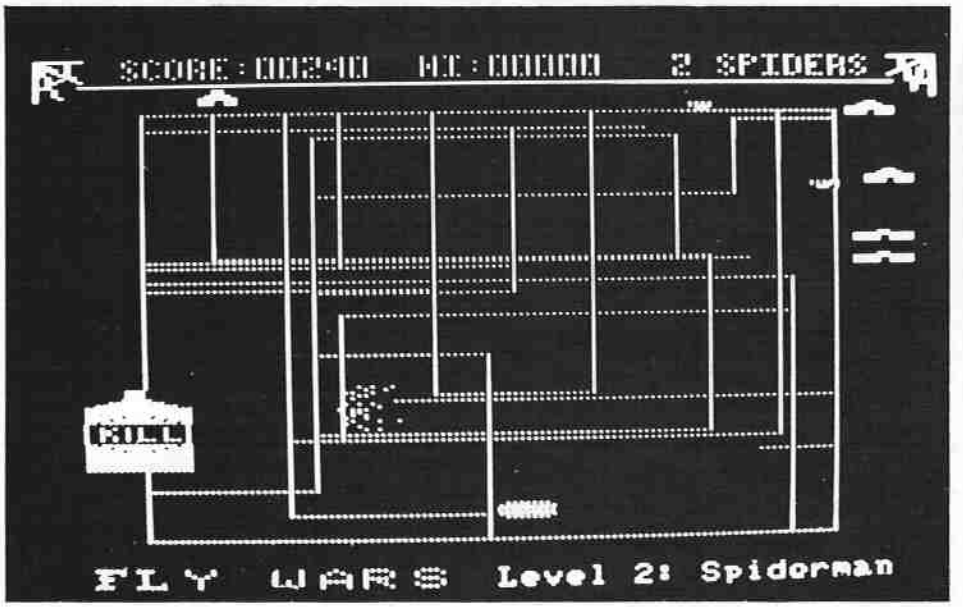
The scenario is simple. You are aboard a pirate ship with only your sword between you and a watery grave. At first the pirates come at you one at a time. But that's too good to last, so take two, with the odd killer rat, scorpion or snake thrown in for good measure. The thing is, the protagonists loom pretty large on the screen and that, plus the range of movement available, make for a quite credible duel. One can parry both high and low attacks. So on guard, thrust and lunge. Three keys, A S and D, control movement left, spin round and right, so with little practice the clumsiest wielder of knife and fork can pass muster as a swordsman of sorts.

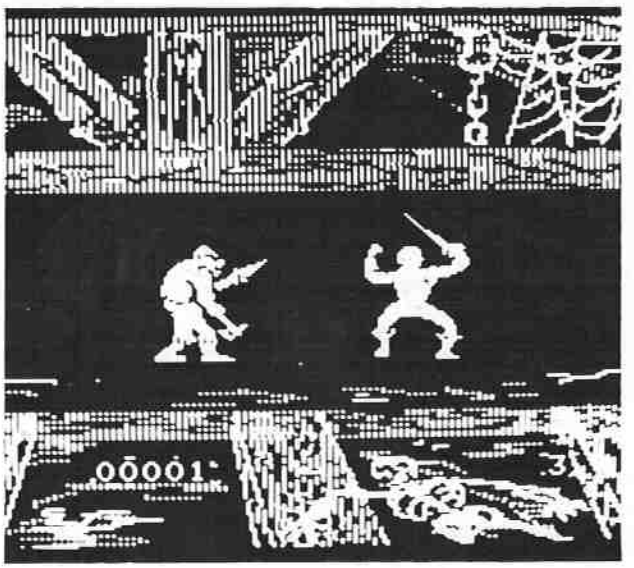
Each opponent proffers a new challenge and it takes time to acquire the skills to kill them before they slit your gizzard. And when *(or if, in my case)* you win 20 duels the program promises new and even more terrible opponents.

Last, but certainly not least, for it stopped me in my tracks, comes Fly Wars, by Sirius, in which the player, as a spider, has to spin a web to trap and devour fly-fighters and the occasional caterpillar. The struggle is by no means one sided, for the wily opposition can douse you in lethal bug spray.

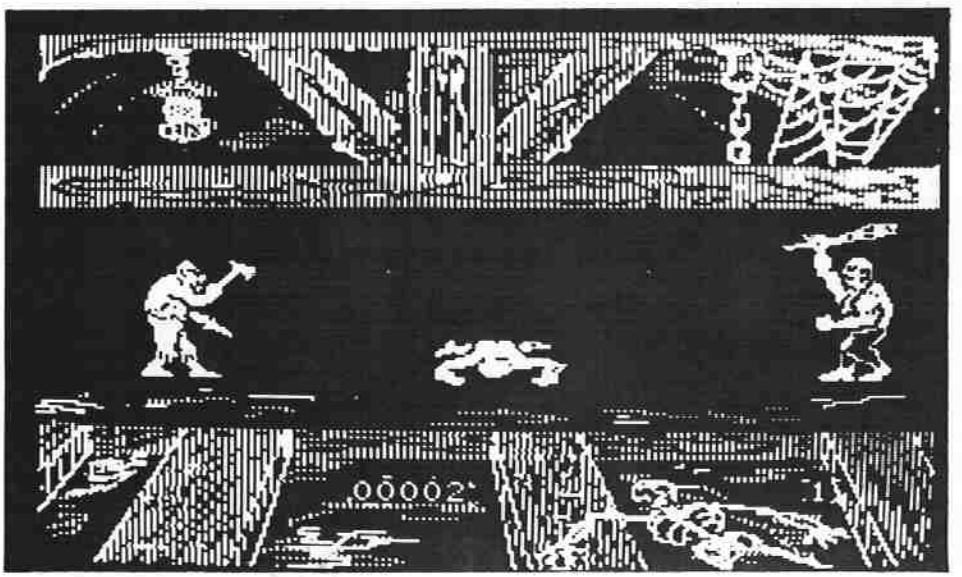
My problem was that the spider sped too fast; the web wandered the length and breadth of the screen to little effect. Consequently not a great number of flies were noshed. Great, no doubt, for the fleet of finger, but I fancy in the next reincarnation I'm more likely to be a beetle, not a spider.

All the games reviewed above have colour which adds to their attraction, though it may be significant that with two screens before me I found myself more often than not – especially in the fraught fight sceens – watching the mono screen. Perhaps old habits die hard. ●





IT's the sort of Fly Wars web no self-respecting spider would own up to (above). But then no spider need press buttons to perform its magic art. Right and below, two excerpts from a below decks fracas in Swashbuckler. Recumbent figure below is the hero, found sadly lacking in the speedy riposte stakes.



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Helping the user make the most of your software

By ROBERT J. BEYNON

IN discriminating between good and bad commercial software one important question to ask pertains to the user friendliness of the program. This property is poorly defined but includes several important considerations:

- ☐ What is the extent of the error trapping in the program?
- ☐ How does the program respond to invalid data, either accidental or deliberate?
- ☐ How personalised is the software? For example, does the program ask for DATA POINT (9) or EXPERIMENTAL TIME POINT (9)?
- ☐ How much assistance does the program offer and can the extent of the assistance be modified to suit the current expertise of the user?

The last point is an important one in the design of software for microcomputers. The most common way of providing help in a program is to take some command, such as the question mark, as a signal that the user requires assistance.

When the request is made the program will jump temporarily to a subroutine that displays a "help page" giving current options or valid data ranges or simply a description of the next stage of the program.

This approach is particularly useful when the user is presented with a choice such as "Do you wish to calculate residuals? (Y or N)". A request for assistance might then point out the advantages and disadvantages of choosing this option and advise on additional computational overheads if appropriate.

The approach of using a help key and displaying help pages is superior to the simpler alternative of giving all of the background information every time the program is run since this will eventually irritate the competent user. It follows then that there must be some way of retaining the help pages in a form that is readily accessible to the program but only when assistance is specifically requested.

Several options are open in deciding on a suitable method of storing help material and it is instructive to consider the relative merits of the different approaches.

It is possible to discriminate between two widely different methods of storing the help information. One method retains the information in RAM concurrently with the main body of the program. The information can be stored as a series of DATA statements or simply as a series of PRINT statements to print a sequence of strings on the screen.

Alternatively, the help pages can be stored on magnetic media and loaded into memory for display as required. The lack of random access with tape systems precludes this approach for anything other than a disc-based microcomputer system.

The retention of help information in RAM means that it can be displayed rapidly and as required, but there are two primary disadvantages.

Firstly, the need to store this information in RAM reduces the memory that is available for programs and data. Any conflicts that might ensue will inevitably result in the disappearance of some of the help material from the program, making it harder to use as the development of the software proceeds.

Secondly, the formatting of text in DATA or PRINT statements is difficult to achieve if words are to be prevented from spilling over to the next line.

If, however, the help information is kept on disc, the RAM that is available for program/data is released and there is no tendency to restrict the amount of user assistance that is available.

There will be an additional delay due to the time required to load the information from disc, dependent upon the method of storage of the text. Formatting of the text might also be simpler since the help pages can be set up in advance using an editor program, saved on disc and then recalled by the software under development as needed.

The remainder of this article describes a way of saving help information on the Apple disc system. The textual information is saved as a binary file and BLOADed into the Apple when requested by the user. The method of saving text relies on making a copy of the area of RAM corresponding to the screen display of the Apple.

To facilitate the development of visually attractive help information a simple editor has been written to manipulate text on the screen. The features of the editor (Instruction File Editor – IFE) will be discussed later.

BSAVEing the screen memory map

The Apple text display consists of 960 characters (40 wide by 24 high) mapped into an area of user memory (RAM) at the rate of 1 byte/character. The screen memory map resides from $400 to $7FF hexadecimal or 1024 to 2047 decimal and thus consists of 1024 memory locations. The remaining 64 bytes are used by some peripheral boards as scratchpad RAM.

Unfortunately the relationship between the character position on the screen and the memory location of its corresponding byte is far from simple (Apple Reference Manual, page 16) and the act of POKEing each successive screen location with a character is not a case of a simple loop.

Furthermore the additional bytes not used by the screen map are not neatly located at one end of the area of RAM. For example, memory locations 1024 and 2039 are both valid screen addresses.

Rather than avoid this problem by using a complicated routine to save only text-mapping RAM addresses. I adopted the simple approach of BSAVEing the whole area of RAM from $400 to $7FF. The binary file is five sectors long for each page of instructions or help information.

When the program issues a command to BLOAD a page of information the screen changes in approximately one second to show the new information. Also, because the binary file is saved as a copy of the area of RAM in sequential byte order, the unusual screen mapping of the Apple means that the text appears in a rather unusual fashion, filling up lines 1 to 8, lines 9 to 16 and lines 17 to 24 simultaneously.

Thus the use of a disc file correspond-

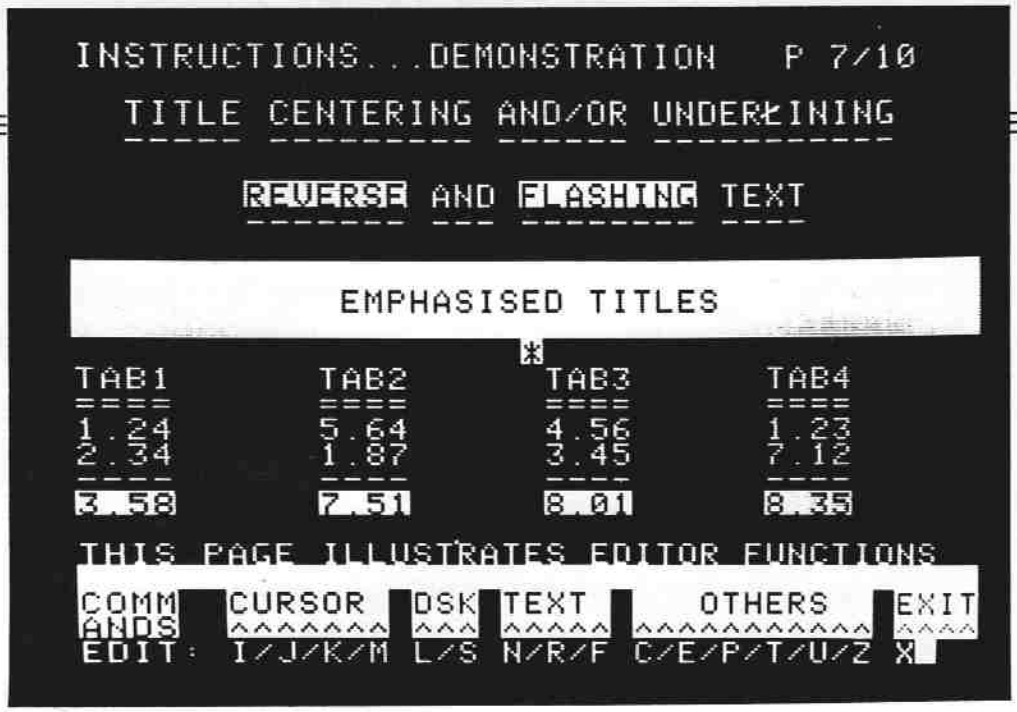

Fig 1. The instruction File Editor in use. The example on the screen shows some of the features of the IFE, including the heading, page numbering, editor prompt line and the text display.

ing to the memory map of the text screen of the Apple can be used effectively to provide practically instant display of additional information as requested by the user.

The major problem remaining is to find some means of displaying, editing and finally BSAVEing text. The solution to this problem is given by the editor that I have developed (IFE) and which is described below.

The Instruction File Editor

The IFE was written to facilitate the establishment of a set of help pages associated with any other program under development. When RUN or BRUN (see later) the IFE presents the user with the main menu:

```
1....CREATE A NEW INSTRUCTION FILE
2....EDIT AN EXISTING FILE
3....TRANSFER A FILE TO ANOTHER
     DISC
4....DELETE AN INSTRUCTION FILE
5....PRINT AN INSTRUCTION FILE
6....END PROGRAM
```

Naturally, the program performs full error and range checking whenever data is input to the computer. Thus, selection of Option 7 would simply be ignored by the program. A description of each option is given below:

```
1....CREATE A NEW INSTRUCTION FILE
```

When the user wishes to create a new file of help pages the program first requests the name of the new file (up to 15 characters long) and then the number of help pages in the file (up to a maximum of 15 pages/file). The screen is then cleared and is headed with the title given previously.

Additionally, the number of the first page is shown on the top right hand corner of the page as "P1/12", the number of pages in this instance being specified as 12. The program then saves this page (blank except for the heading) before setting up the page heading for the next page "P2/12" and saving that blank page on disc.

The whole process is continued until all of the instruction pages have been saved as binary files on the disc, each blank except for the heading on the top line of the text display. If there is no room on the disc for all of the pages the program will indicate that fact and give advice on correcting the error.

If the creation of a new instruction file was successful the disc CATALOG will display a new set of binary files, each five sectors long and named in the following manner (assume the name of the file was specified as PATTERNSEARCH, consisting of four pages):

```
B 005 PATTERNSEARCH...P:1
B 005 PATTERNSEARCH...P:2
B 005 PATTERNSEARCH...P:3
B 005 PATTERNSEARCH...P:4

2....EDIT AN EXISTING FILE
```

To edit an existing file the user is first asked for the name of the file and the first page of the file is then loaded. It is necessary to load the first page because the program "discovers" the number of pages in the file by looking at the header information in page 1 (eg. P1/14).

Secondly, some of the functions of the editor require that the editor retains a map of the screen display (as an array SC(39,23)). The next step is therefore the mapping of the screen into the array. This takes approximately 10 seconds in the uncompiled version of the program.

Finally the cursor (a flashing asterisk) is displayed, and editing may commence. To enter text the keyboard is simply used as normal but a whole 22 lines of text can be typed at one time without any limitations.

Only 22 lines are available because the top line is used for the heading and page number while the bottom line is used for editor prompting (Fig.1). Editor commands are invoked by holding down the control key simultaneously with another key. There are 16 editor commands in total (Table 1).

The cursor commands (I,J,K,L,T) give a flexible means of moving the typing position around the screen without disturbing the contents of the screen display. The cursor wraps around the screen in all directions; thus repeated CTRL M com-

→

a. cursor moving commands	
CTRL I	cursor up
J	cursor left
K	cursor right
M	cursor down
T	T(ab) to next position
P	returns P(osition) of cursor (x,y)
b. text display commands	
CTRL E	E(mphasise) current line
C	C(entre) text on current line
U	U(nderline) text on current line
R	display R(everse) text
F	display F(lashing) text
N	display N(ormal) text
Z	clear whole page (Zap!)
c. disc commands	
CTRL L	L(oad) new page
S	S(ave) current page
d. miscellaneous	
CTRL X	e(X)it edit mode

EDIT: I/J/K/M L/S N/R/F T/U/E/P/Z X

Table 1. A summary of the editor commands provided by the Instruction File Editor. Further details of the commands are given in the text.

mands will move the cursor down the screen until line 23 is reached, whereupon the cursor returns to the top line at the same horizontal position.

The TAB command gives four unalterable positions at horizontal settings of 1, 11, 21 and 31 characters and wraps around repeatedly on the same line. The TAB settings are useful for setting up tables or columns of figures in the help pages.

Finally the position command (CTRL P) returns the vertical and horizontal position of the cursor on the command line. In general, the command line displays the editor commands but is also used for prompts and information.

The text display commands are used to enhance the appearance of the help screens. The three commands – CTRL N,R and F – are used to toggle the display of text in one of the formats that are standard in the Apple: Normal, Reverse (inverse) and Flashing. All subsequent text is displayed in the mode that is selected until a new mode is toggled.

The emphasise command reverses a whole line at once to highlight a line of text and can be used to display a solid line of white spaces by using CTRL E on a blank line. The centre command will take all text on the current (cursor containing) line and, ignoring leading spaces, will centre the remainder on the same line.

The underline command simply places a minus sign under each non-space character on the current line. Finally, the whole screen may be cleared by using the CTRL Z command.

The two disc commands are simply CTRL L and S for load and save. All disc access is performed using the currently displayed page or the page specified by the user. To prevent the user accidentally selecting one of the disc access commands the program requests confirmation of both options and, if the load option is selected, the user is reminded to save the current page if needed.

I have found it practically impossible to make an inadvertent mistake using the load/save options of the editor.

```
3....TRANSFER A FILE TO ANOTHER
     DISC
```

The rationale behind this option was to use a work disc to prepare an instruction file for a program and then, once the file was finished, to transfer the file to the program disc that contained the software using the instruction file.

The transfer file allows for a one or two disc environment, and although transfer takes place automatically with two drives there is a requirement for frequent disc swapping if a single drive is used.

```
4....DELETE AN INSTRUCTION FILE
```

In accordance with the rationale outlined above, there was a need for an option that permitted the deletion of an instruction file from the work disc once the file had been transferred to another disc. This option provides that capability and eliminates the tedium of a lot of manual DELETE commands at the Basic command level.

```
INSTRUCTIONS...DEMONSTRATION   P 3/10          0
                                               1
CONTROL-K:CURSOR RIGHT                         2
                                               3
CONTROL-M:CURSOR DOWN                          4
                                               5
CONTROL-P:GIVES CURSOR POSITION & ASCII        6
          CODE AT CURSOR POSITION              7
                                               8
CONTROL-R:DISPLAY REVERSE TEXT UNTIL A         9
          CONTROL-N IS GIVEN                   10
                                               11
CONTROL-N:NORMAL TEXT                          12
                                               13
CONTROL-T:TAB ACROSS PREDEFINED TABS           14
FIRST     SECOND    THIRD     FOURTH           15
                                               16
CONTROL-U:UNDERLINE TEXT IN CURRENT LINE       17
                                               18
                                               19
CONTROL-Z:CLEARS WHOLE SCREEN                  20
                                               21
CONTROL-X:EXIT EDITOR                          22
```

Fig 2. A sample output from the print option of the IFE main menu.

```
5....PRINT AN INSTRUCTION FILE
```

This option was provided to allow a hard copy of the instruction file although it cannot simulate the reverse or flashing attributes of text on the screen. The option provides for printing of the complete file or a single page in the file and is an exact character for character copy of the whole help page, including the inaccessible top line.

The hard copy of the instruction file is of particular value in the preparation of the manual/instructions for the program (Fig. 2).

```
6....END PROGRAM
```

An ordered exit back to Basic.

Compilation

The need to maintain a two-dimensional array map of the screen and the frequent array manipulations that were required by the IFE suggested to me that compilation of the Basic program might provide a significant speed increase since array functions are among those most responsive to compilation.

Using the Hayden Applesoft compiler, the size of the program increased from 35 sectors to approximately twice the size but the compiled version ran without compilation or run-time errors and gave impressive (10-20 fold) increases in the speed of array oriented functions such as screen mapping or clearing.

In this case, the use of the compiler gave a very definite improvement in the performance of the IFE and was a pleasure to behold. The compiler itself is very easy to use, although the error messages could have been more explicit.

Conclusions

The IFE is a program that will be of use only to persons writing software that is sufficiently complex to need some degree of user assistance as an inherent feature. By relinquishing memory space (due to the relegation of the help pages to disc) the free memory for the program/data can be increased and more functions included as standard features.

In my experience users are not enthusiastic about using manuals for assistance, and a self documenting program can go a long way towards solving this problem.

I would be pleased to send copies of the IFE (both the Applesoft and the compiled version for comparison) to anyone who is interested in this approach to software development. If you wish to receive a copy, please send me a blank but initialised DOS 3.3 disc with a cheque for £10 to cover handling charges and instructions.

● *As the IFE program is too long to publish as a listing, copies can be obtained from the author of this article, Robert J. Beynon, Department of Biochemistry, University of Liverpool, PO Box 147, Liverpool L69 38X.*

This comprehensive self-tuition program to give a thorough grounding in morse code incorporates a real time morse code translator. Its designer, SEAN OVEREND, is himself an amateur radio operator, callsign G4BVS.

Learning morse without going dotty

THERE are available many devices, both in hardware and software form, that provide morse code output at various speeds. Often absent among them is any means of automatic assessment of the user's achievements as he attempts to interpret the code sent by the device.

Equally, generally lacking is any code translation facility whereby the user is able to practise sending morse code, which is then translated immediately into characters, thereby giving him the opportunity of seeing how his transmitted code would have been interpreted by a listener.

This program attempts to remedy both these deficiencies and in so doing to provide the basis for a structured and comprehensive learning of morse code.

It has several interesting aspects. Firstly, it is an educational device. Secondly the program itself is of interest, and it solves the problem of real-time translation to and from one language – morse code into normal characters – by using a hybrid of two programming languages, Basic and assembly language.

The third area of interest is confined to the machine-code translation subroutine, which is of sufficient portability for it to be used in an actual communication system rather than merely as a training aid.

Educational aspects

In designing an educational device there are two primary matters to be considered – the goals to be achieved and the means of achieving them. In this case the twin goals are to enable a user to learn how to receive and to send good quality morse code at reasonable speeds. The means were conceived as being the use of a microcomputer, using its ability to create sound, display information on a screen and accept keyboard input.

Learning, in this context, implies the presentation to the user of new information and its subsequent retention by the user, achieved by repetitive practice.

There are two specific facilities the user needs to acquire – the ability to listen to morse code transmissions and to convert them to ordinary characters; and the ability to transmit correctly formed code. Both these facilities can be learned initially at low speeds, which are then improved by repetitive and steady practice.

Experience has shown, however, that there are two standard difficulties in the way of learning morse. The first is that the will to learn may evaporate because of the sheer tedium of the exercise. The second is the failure of the user to think in terms of letter patterns as a whole, preferring to think, for example, of the letter P as a "." followed by "– –" and then a ".", instead of "di-dah-dah-dit".

The first difficulty can be overcome, in part, by the educational medium providing variety, stimulation and some form of continuous self-assessment. The second obstacle may be reduced by providing facilities for presentation of letter groups at fast speeds, but separated by longer gaps for the purposes of identification.

Learning morse code sounds

This program provides for three types of presentation of morse code sound information to the user. The simplest is a run-through of all the characters, displayed visually and sounded simultaneously at any selected speed.

Second in simplicity is the TEST mode, which allows the user to select limited groups of letters and characters which the computer then. sounds in random sequence at transmission speeds selected by the user. Identification is required of the user immediately after the sound is sent by depressing the corresponding key on the keyboard. This identification must take place within a specific period of time, which is changeable by the user.

Achievement scores are calculated and maintained automatically by the computer. The user may also repeat the previously generated sound if he so desires. Thus using this TEST mode the user may test himself on progressively larger groups of letters or characters using progressively shorter identification times, and moving on in a structured way when he has achieved a predetermined success rate which he can see immediately by the display of his score on the screen.

The user is also able to alter the speed of transmission of each letter code group, quite independently of the delays between groups, thus providing for letter "pattern" recognition at an early stage.

Presentation of the next random test sound group does not follow until either a correct identification of the preceding sound is made within the preselected delay period, or until the correction of a wrongly identified sound has been absorbed by the user (which he indicates by a tap on the space bar).

The TEST mode is thus one which allows the user to learn to recognise sounds under some degree of time constraint, caused by the delay factor selected by the user himself.

This is not a complete time constraint, because a mistake by the user prevents further presentation of the next random sound until the automatic correction by the computer has been acknowledged by the user.

The final form of presentation of morse code sounds is achieved by using the MESSAGE mode. This simply transmits the code sounds of pre-entered messages – which can be stored on and retrieved from the disc at will – at any speed. The user can choose the speed of translation and also alter the gaps between letters

→

THIS program is a combination of Basic and assembly language subroutines. It is written for the Apple II with DOS 3.3 and assumes that a disc drive is available. The Basic occupies 8.2k of memory. The machine code subroutines occupy a further ½k and may be re-assembled anywhere in available memory.

The assembly language program has been assembled starting at memory address decimal 36,600, using a 48k memory Apple. HIMEM must be set below the start of the assembled machine code, namely to 36,500, before running the programs.

MORSE CODE

and words (e.g. transmission at 12 words a minute but with gaps appropriate to six words a minute).

Further, the user may choose to type his interpretation of each sound *while the actual transmission proceeds*. The screen will display the correct character after it has been sounded. However, if the user's identification of it is wrong, then the screen display of each wrongly identified character will be in flashing mode. At the end of the message transmission, the user's percentage success rate for interpretation of that message is immediately displayed.

The time within which the identification has to be made by the user is limited, and cannot take place after the next sound has begun. Gaps between words provide a welcome respite, as the space bar needs to be tapped when a word gap has been reached.

Obviously the MESSAGE mode is the nearest the user will get to real-life morse code reception. If the user is unable or unwilling to use a keyboard, he can assess himself from the final displayed message on the screen, since this mode also provides for straight transmission without requiring any input from the user.

Learning to transmit

Usually morse code is sent by means of a key, either of the ancient and time-honoured variety, or with some mechanical or electronic means of sending repeated dots or dashes automatically (e.g., using a "bug").

This program provides its own method and uses the "O" and "P" keys, which are immediately adjacent to the "REPT" key. Depression of the "O" key will send one "dot". The "P" key sends one "dash". The "REPT" key may be used in conjunction with either, to send repeated dots or repeated dashes. It is rather like a three finger "bug".

The relative length of the dots and dashes can be altered in this part of the program as in the previously described part.

The fun for the user comes from the programmatic translation of what he has just sent in morse code – which was sounded when he depressed the "O" and "P" keys – into ordinary characters displayed on the screen. This translation facility relies upon the gaps between letter components, and between individual letters, not being exceeded for the selected speed.

Thus if the user transmits too slowly, the computer will show this by displaying "word gaps" on the screen, or by identifying parts of letters as letters themselves. "PLEASE" may be displayed as "PLEAS E" if the "E"s are not transmitted fast enough, or "B" may become "TS" (– . . . becoming – . . .) because of too long a delay within the letter).

Conversely, too fast transmission may cause elision of words or letters. Thus "GOOD MORNING" becomes "GOODMORNING" or "ST" becomes "V" (. . . – becomes . . .–).

The user will soon realise that correct transmission of morse code, generally and erroneously regarded as easy, requires considerable concentration and discipline. Without such a simultaneous translation display, however, the user may never realise that his transmitted code is far from perfect, and never realise precisely where his errors lie. Having said that, it is of considerable amusement value to the user to see on the screen the translation of what he has just transmitted.

Further it is clear that this translation feature could be used to provide instant translation of morse, sent not only by the "O" and "P" keys, but sent by one computer/transmitter to a separate computer/receiver over considerable distances.

There is provision in the translation mode for the user to alter the speed of code expected by the translation (and with it the relative lengths of the dots and dashes emitted on depressing the "O" and "P" keys), as well as to alter the gaps between letter components and letters. In this way individual styles of transmission can be catered for.

More importantly, this flexibility provides the means for synchronisation, should the sub-routine be used in a communications, rather than a training, situation.

A structured learning approach to the reception of morse code is thus possible by using the TEST and MESSAGE modes in conjunction. The user will select progressively faster transmission speeds in both modes, progressively shorter "delay factors" in TEST, and "gap speeds" more and more closely approaching the actual code transmission speeds using the MESSAGE mode.

The messages themselves can be pre-recorded and stored on disc for subsequent recall, as previously set out. Obviously, the message content of each recorded message can be graded at will.

In view of these comprehensive assessment facilities it is relatively easy to devise a sequence of progressions, and to decide at what measure of achievement to move from one stage to another.

Transmission practice can also proceed in a structured manner by progressively increasing the speeds of translation expected by the computer. If necessary the built-in gaps between letter components and letters can also be altered as the speed of translation is increased.

Programming techniques

In order to give the user the opportunity of familiarising himself with morse code sounds, the computer must be programmed to convert ordinary characters into sounds which are then transmitted by the computer.

Conversely, in order to give the user practice in transmitting morse code himself, the computer has to be programmed to recognise what code the user has just sent and to convert those various groups of sounds, which the computer will have to generate as well, into the appropriately translated letters and words.

Looked at from this point of view, the previously described playthrough, TEST and MESSAGE modes of the program all require the programmatic transmission of code sounds by the computer, while the translation mode requires a program that will recognise code sounds sent by user. In this part of this article transmission and recognition are used in this context.

It should also be noted that although this program uses two languages whose variables may provide the same information (e.g., length of dot sound), in not all cases will those variables contain the same absolute values, unless there has been a distinct communication from one to the other, for example from the Basic program to the assembly language program by means of a POKE statement.

Basic program variables are written in this article in the normal way. In order to distinguish them, assembly language program variables are contained in square brackets.

Figure 1 shows the relationship of time against sound of a typical morse code segment. It is this type of sound signal that the computer has either to transmit or to recognise for the purposes of the training program. Dealing firstly with transmission, there are five measurements of time that are material:

(i) Dot length.
(ii) Dash length.
(iii) Gap between letter components.
(iv) Gap between letters.
(v) Gap between words.

When generating code the computer has to comply with each of the above five parameters. As speeds of transmission increase, so the values of each of the five

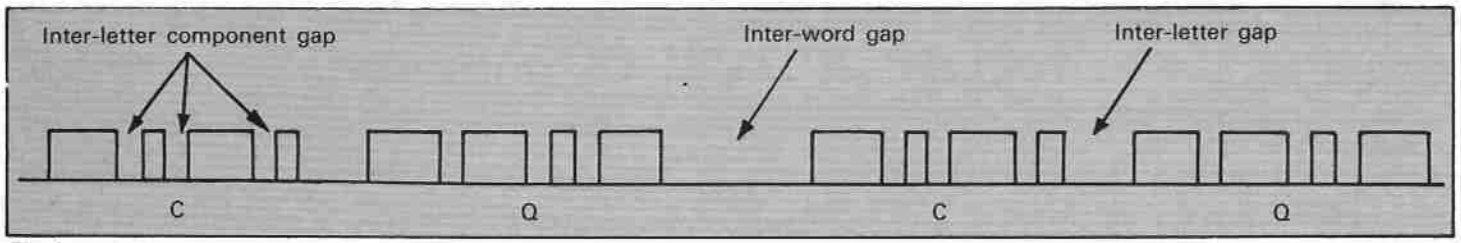

Fig 1

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MORSE CODE

parameters will diminish, but they will maintain the same relationship one with another.

Recognition does not require the same five parameters. For the purposes of this program four factors are regarded as being sufficient for the purposes of recognition. These are:

(i) Is the current sound a dot?
(ii) Is the current sound a dash?
(iii) Is the gap between the current sound and the last sound less than the maximum inter-letter-component-gap?
(iv) Is the gap between the current sound and the last sound less than the maximum inter-letter gap?

It will be noticed at once that recognition requires the identification alone, rather than the measurement of the length of the current sound. Hence depression of the "O" key means it is a "dot" and depression of the "P" key means it is a "dash". Equally, only two gap comparisons are required, since any gap over the maximum letter gap is assumed to be a gap between words.

Both transmission and recognition require separate look-up tables, the former to convert from characters to dots and dashes (e.g., C to –.–.) and the latter to convert from letter component groups to characters (–.–. to C). So far as transmission is concerned the relevant sequence is:

1. Get the character.
2. Look up the number of dots and dashes for that character.
3. Transmit the dots and dashes accordingly, at the desired speed, with appropriate sound lengths and gaps.

So far as recognition is concerned, the relevant sequence is:

1. Build up the letter components until a gap greater than the inter-letter-component-gap is reached.
2. Match the current group of letter components against the appropriate character designation in the look-up table.
3. Output the matched character to the screen.

It follows from this that recognition must always be one character in arrears, by virtue of the fact that the look-up procedure cannot start until a gap greater than the inter-letter-component-gap has been found, which will not take place until the next letter has been commenced.

So far as the actual programming language is concerned, a decision has to be made as to which of the two programming languages to use, Basic or assembly language. The former is easy to program and change, but slow in execution in certain circumstances. The latter is more complex, takes longer to program, but is considerably faster in execution.

The obvious candidate for assembly language in a program such as this is the generation of the dot/dash sound, which must be produced at different lengths and pitches of sound. The question is, what else needs to be in machine code?

The answer selected in this program is the translation mode, which provides the morse code recognition feature, since this has to be done at such a speed as not to impede the flow of the user's morse transmission.

Char	Ascii	Subtract	Index	0	1	2	3	4	Morse
A	48	48	0	1	2	3	0	0	.-
B	49	48	1	2	1	1	1	3	-...
C	50	48	2	2	1	2	1	3	-.-.

Array A(25,4) letters only — 1=dot 2=dash 3=end-of-letter

Basic look-up table — Characters to Morse Code

Fig 2

Interestingly enough, it was found that the actual measurement of the gap parameter between succeeding morse code sounds can be achieved quite adequately using a Basic counting loop, rather than using a machine code counter.

The resulting count is passed as a parameter to the machine code recognition sub-routine using a POKE statement. The reason for this observation is that the speed of transmission of hand sent morse code is of a different order of magnitude from the speed of execution of machine code.

Put another way, you don't need the accuracy of a Swiss watch to measure the rate of progress of a Swiss glacier!

In the result, the program is written primarily in Basic except for the note generation and recognition sub-routines. (There is also a machine code initialisation sub-routine.)

When the Basic program is run the first step is to initialise all variables that are concerned with transmission speed and pitch of the note, to load the machine code sub-routines – which include the machine code look-up tables – from disc into memory, and finally to set up the Basic look-up table.

Two look-up tables are required, one for the Basic program and one for the machine code recognition sub-routine.

The Basic look-up table converts from character to code. The method adopted is to use the Ascii representation of the character in question as the means of calculating the index of a 2-dimensional array, each row of which corresponds with the morse code representation of that letter. The convention is adopted of "1" is a dot, "2" is a dash, and "3" is the end-of-the-letter-group identifier. Figure 2 shows the set-up for letters. The conventions "1", "2" and "3" are specifically chosen so as to provide the appropriate subscripts for a CASE-type statement (ON (1,2,3) GOSUB (DOT), (DASH), (END OF LETTER)).

The machine code or recognition look-up table has the task of comparing letter sound groups and then producing a screen character. It is slightly more complex than its Basic brother.

Firstly the look-up table is divided into sub-tables, containing letter groups sorted by length. Thus, E "." goes into the sub-table containing one component, A".–" goes into the sub-table containing two components, etc. Secondly each sub-table is sorted into descending "numerical" order, assuming for this purpose that a dot is represented by "0" and a dash by "1".

Figure 3 shows as an example the sub-table containing three components for each letter. Each sub-table has two parts, one which contains the representation of the morse code letter group, the other containing the appropriate screen character representation for output onto the screen.

Finding the appropriate morse code letter group in one part of the sub-table means that the screen can be given the right character by looking at the corresponding part of the second sub-table.

The reason for this organisation is to reduce searching time, as the identification of the length of the letter sound group in question immediately identifies which sub-table needs to be searched through. Further, the ordering within each sub-table enables searches to be curtailed as soon as a table element is located of value lower than that being searched for.

The Basic variables that alter the characteristics of transmission of morse code sounds are the following:

(1) Pitch PH.
(2) Dash length DA.
(3) Dot length DT.
(4) Inter-letter-component-gap IL.
(5) Inter-letter-gap PL.
(6) Inter-word-gap PW.

The alteration of transmission speed is possible in one of nine different ways – lines 2550-2680 of the Basic program – with the relationships between the various variables being maintained by the mathematical formulae set out in line 2600.

SS is simply the index of a string array SP$, which enables the printing out of the various nine speeds of code transmission. PL and PW are alterable by the user inde-

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pendently of DA, DT and IL, and in those circumstances the different "gap speed" chosen by the user is represented by the index SG. Translation speeds are simlarly displayed using TR$ and the index TR.

Each time transmission speed or pitch is altered by the user the computer generates a morse code "K", so that the user can observe the new pitch or transmission speed and confirm that it is what he wishes to hear.

Alteration of parameters to the machine code sound-producing subroutine, [NOTE], is achieved by POKEing the new values of the Basic variables into the corresponding assembly language location. So far as pitch is concerned this means that PH goes into [PITCH] – see Basic program lines 2690-2780. Dot length DT, or dash length DA, goes into [LEN].

Alteration of recognition speed in the machine code translation subroutine is again controlled from the Basic program by POKEing constants into the appropriate memory locations. The main variable recognition parameters are I1 (the inter-letter-component gap – POKEd by the Basic program into [ILCG] at decimal 254) and I2, (the inter-letter-gap – POKEd by the Basic program into [LG] at decimal 255).

The other two recognition requirements – that is, is it a dot or is it a dash? – are indirectly derived from selecting different entry points into the machine code subroutine.

If the user depresses the "O" key for a dot, line 2380 of the Basic program enters the machine code subroutine at decimal 36805 – the dot entry point. If the "P" key is depressed then line 2390 of the Basic program chooses the dash entry point at decimal 36811.

In both cases the time that has elapsed since the termination of the last sound is "counted" by the number of times the "infinite" Basic loop at lines 2360-2370 is executed (and is then stored in CT).

Letter	Morse	Code3 Letter-group	Out3 Screen output
O	---	00000111	$CF='O'
G	--.	00000110	$C7='G'
K	-.-	00000101	$CB='K'
D	-..	00000100	$C4='D'
W	.--	00000011	$D7='W'
R	.-.	00000010	$D2='R'
U	..-	00000001	$D5='U'
S	...	00000000	$D3='S'
Space terminator		00100000	
Machine-code look-up table		3 component sounds	Morse to characters

Fig 3

As soon as a fresh key press is detected CT is made modulo 256 and POKEd into [CT], just before entering the machine code subroutine at the appropriate entry point.

Since the translation mode generates a dot or a dash sound when the "O" and "P" keys are depressed, alteration of translation speed also requires the alteration of the length of the generated dot (D1, POKEd into [DT]) and of the generated dash (D2, POKEd into [DA]).

The remaining parts of the Basic program are self-evident from the menu at lines 780-793. Each time the main menu is displayed, the machine code variables are reset to zero by line 780. Each menu selection provides a sub-menu where appropriate. The Basic program is to be found at Listing 1.

Finally to return to the recognition

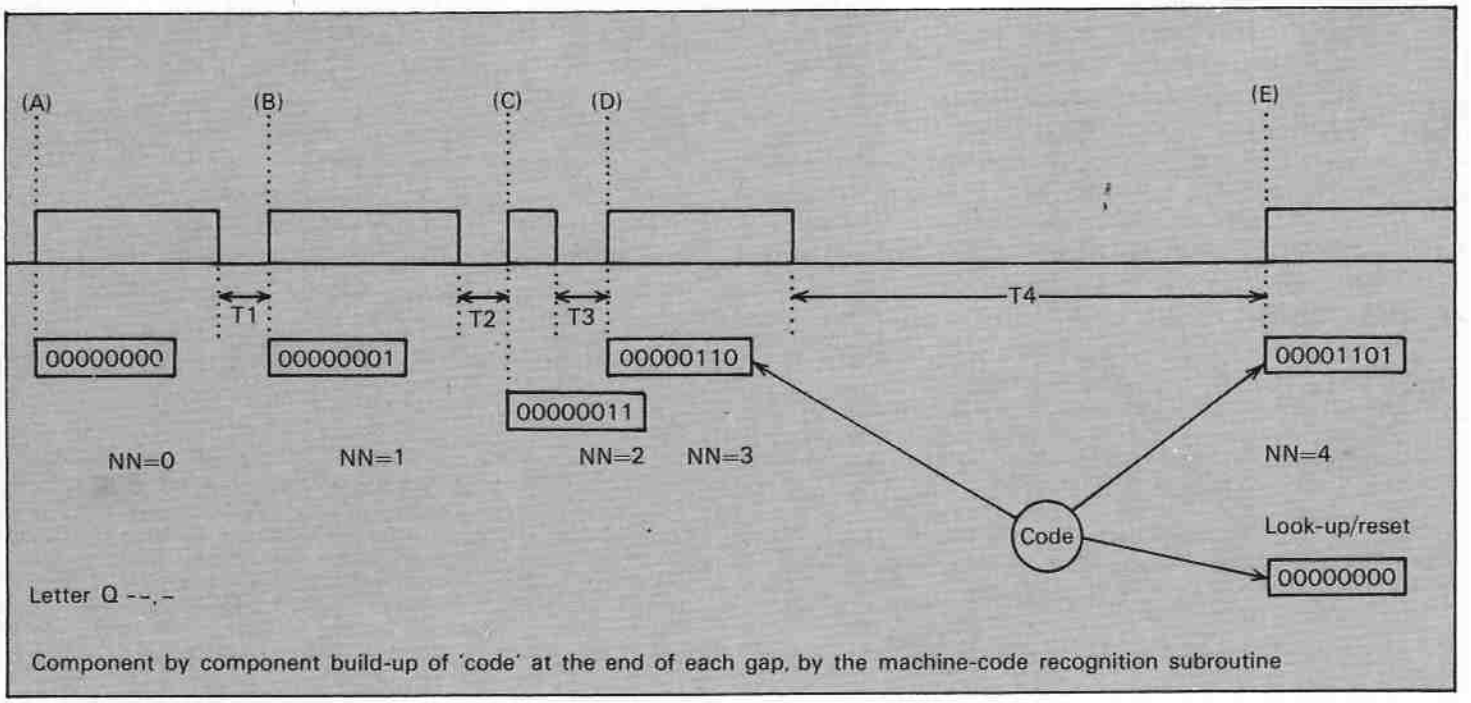

Fig 4

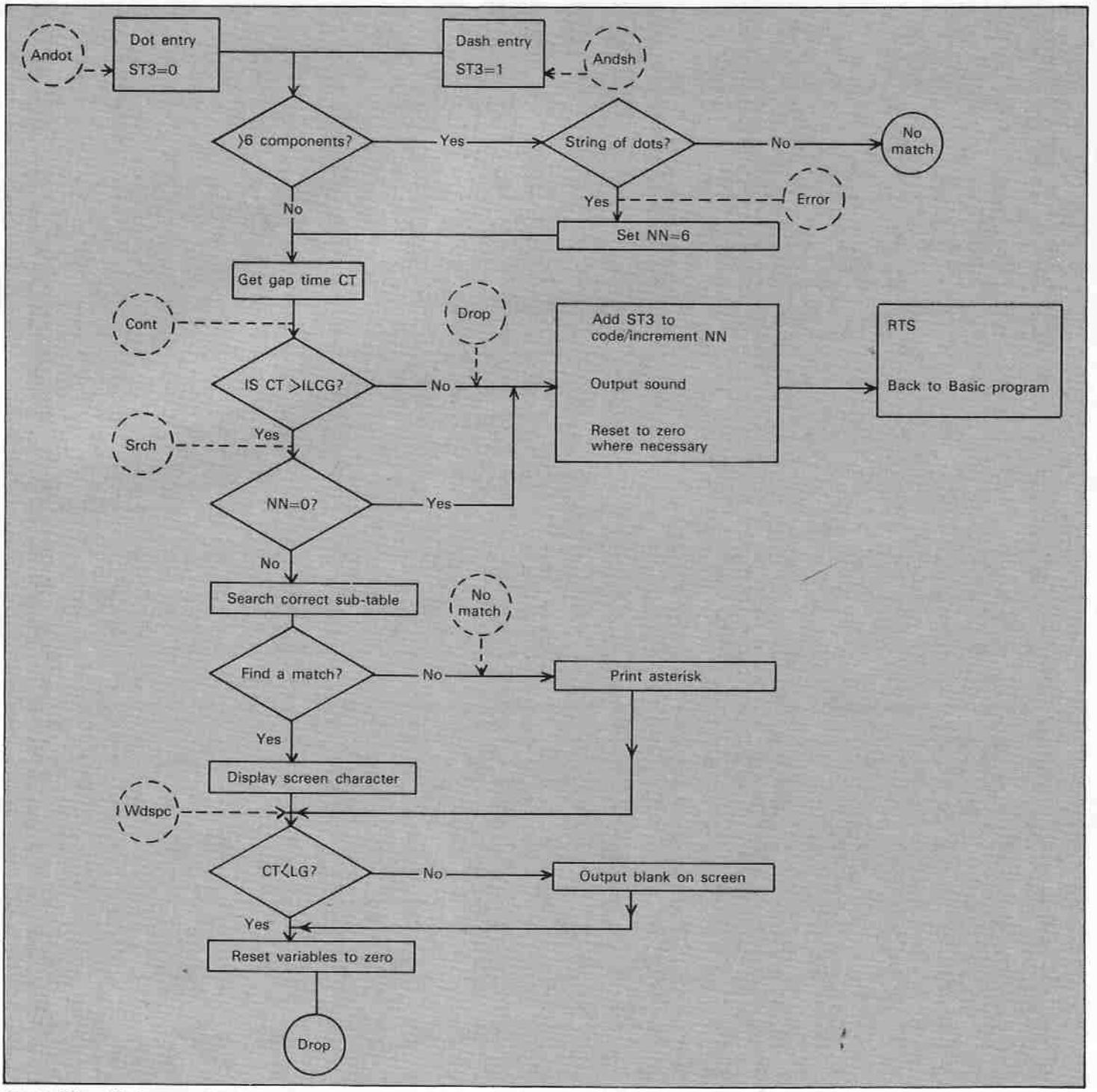

Fig 5 Simplified recognition flowchart

machine code subroutine. The aspect that remains to be explained is how each letter sound group is built up as the "O" and "P" keys are depressed. This is demonstrated in Figure 4, which shows the various states of the letter group [CODE] as the letter "Q" is transmitted.

It will be seen that as the times T_1, T_2 T_3 are found to be all less than the inter-letter-component gap, then each sound (i.e., "O" or "I") is added to the right hand end of [CODE]. This continues until a gap is found greater than [ILCG], – in this case T_4 in Figure 4 – which is the signal for the look-up to commence, having added the most recent sound to the end of [CODE].

A simplified flow-chart appears at Figure 5. The simplification is that the details of how the correct sub-table is identified and searched have been omitted. These details are however apparent from the detailed comments attached to the printout of the assembly language subroutines which are shown in Listing 2.

The assembler used is the author's own editor-assembler, which prints Zs before op-codes, where a zero-page operation has been selected on assembly. Further, memory only needs to be loaded as shown in lines 340 onwards – the earlier initialisations (e.g., line 210) being included in the assembly for clarity rather than necessity. Initialisation in fact takes place when [INIT] (decimal 36727) is called by the Basic program.

The machine code program has been assembled starting at $8EF8 (decimal 36600) and is 404 bytes long. When first loaded into memory the machine code should be BSAVEd onto disc and given the name "BCODER", so that it can be subsequently reloaded automatically when line 18 of the Basic program is executed.

● *To be concluded, with listings, next month.*

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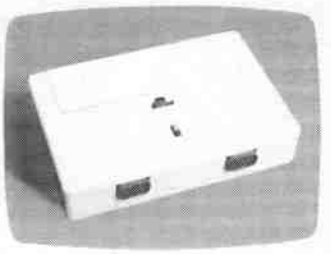

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BOOK REVIEW

Basically sound, but lacking in bright ideas

By MAX PARROT

SINCE the advent of the microcomputer and the growth of what the Americans call hobbyists there have been many books containing programs with a wide subject range aimed at this market. In the past these used to be rather banal because of the desire to make them appeal to all Basic users, regardless of computer. More recently, the increasing size of the potential readership has prompted publishers to produce books aimed at particular micros.

One would expect these more specialised books to be a goldmine of information for the home user, presenting him/her with new ideas, new software techniques, and new firmware information. Unfortunately, these three books fall sadly short of expectations.

The reason appears to be that the programs listed are merely re-hashes of the old generalised programs with a few, minor, "customising" changes. This is underlined where graphical output occurs. None of the programs use the Apple hi-res or lo-res screens. Graphs are drawn using characters (either on the screen or on a printer). Other programs in these three books lack graphical displays; for example, the first book contains linear, multiple linear, N'th order, and exponential regression programs, but all output is textual.

The programs appear essentially correct in their workings and would appeal to a wide range of users. It would be iniquitous to make direct comparisons between the three books – the contents are such that they complement each other rather than compete. As it is difficult to check each listing I selectively typed out programs from each. I discovered one or two small errors and major printing errors in the third book where parts of listings had been repeated in the middle of others. However, the small errors were inconsequential and the large errors had been discovered and were corrected in an errata sheet.

Each of the books has programs on financial, statistical, and mathematical problems. There are also domestic programs such as recipe costs, recipe amounts, home budgeting, cheque writer and temperature conversions. Some of these betray their American origins, referring to medical expenses and amortisation schedules, and many of the financial and general programs would have to be changed for English usage. These alterations range from major financial details to changes made necessary because of differing customs (such as the way dates are written), currency and spellings.

I have other general criticisms of the programs presented. They are generally short and require more extensive input checking than is given. None allow the user to view or change data after typing it in, an essential requirement for particularly lengthy inputs.

These and the mathematical and statistical programs generally offer no guidance to the origin of the algorithms used, nor an indication of when their use is valid (or possibly more importantly, when it is invalid), and only one of the books, the second listed, offers any references to further reading. Sometimes rather naive algorithms are used.

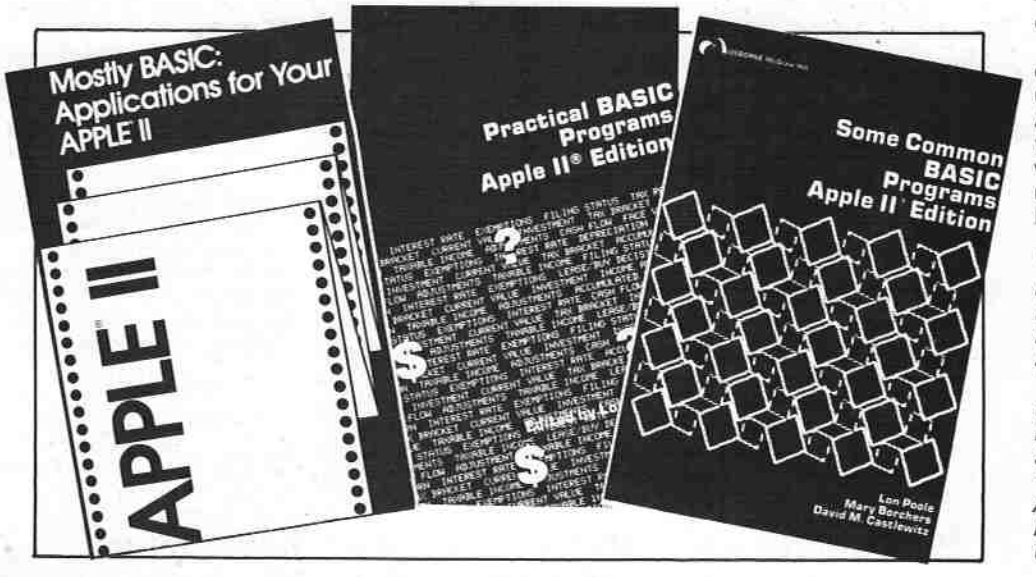
For example, random numbers are generated using statements such as X = INT(RND(1)*6+1) where no thought has been given to disguising the essential non-randomness of the function by re-seeding it in some way.

A few of the programs by their nature ought to be saving data to disc or tape for use in subsequent runs but none do so. The user has to retype it each time or store it as data statements within the body of the program, which is a very clumsy way of doing things.

The first book leans slightly more to the scientific than to the financial in content, whereas the third differs a little from the other two in that some games have been listed (the first two have 'serious' programs), and there are 'educational' programs and 'real time' programs. The latter use the Apple games controller output port to drive a simple hardware interface to the outside world. I think this is very laudable but question the usefulness of the programs presented.

I think it best to view them as examples of practical applications for the Apple rather than real ones. The programs/circuits cover a household mains equipment timer/controller, a telephone dialler – not to be used on GPO lines – and a combination lock.

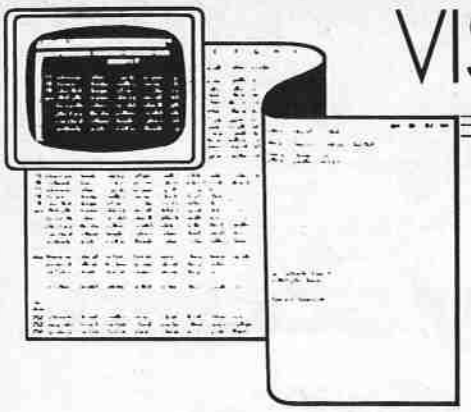
To me, these three books have proved disappointingly staid. They don't really live up to their promise of providing powerful Apple-orientated programs. Against that they do provide a range of programs which will provide a starting point for the user to develop into his/her own suite, possibly presenting some fresh ideas.



"Some Common BASIC Programs, Apple II Edition", Eds: L. Poole, M. Borchers, and D.M. Castlewitz, published by Osbourne/McGraw-Hill, 1981, ISBN 0-931988-68-3.

"Practical BASIC Programs, Apple II Edition", Ed: L. Poole, published by Osbourne/McGraw-Hill, 1981, ISBN 0-931988-66-7.

"Mostly BASIC: Applications for Your Apple II", by H. Berenbom, published by Howard W. Sams & Co., 1980, ISBN 0-672-21789-9.



VISICALC

Keep it simple by thinking matrix

By NICK LEVY
Principal,
Interface Management

ALTHOUGH a firm believer in the virtues of KISS (Keep It Simple Stupid), I am at the same time also inclined to believe that if you utilise your VisiCalc only in a KISSing mode, then the results of your endeavours are likely to have only limited practical applications.

Take for example a typical VisiCalc presentation of a cash budget (Exhibit 1). It is impressive because it shows monthly cash receipts from credit sales and the monthly cash payments for purchases made on credit. Separating the cash flow from the profits is an essential exercise, especially for companies whose sales forecast is on the increase (companies are most vulnerable to cash starvation when their sales are poised for expansion!) But for the sake of keeping things neat and simple, we are not given a clue as to how these figures have been worked out.

Take another look at Exhibit 1 and see if it can provide you with answers to the following questions which are so fundamental to cash flow planning:

What would be the effect on the monthly cash flow if . . .

. . . there is a change in the volume and the price of one or more of the products sold by the company?

. . . the hourly rate of skilled labour goes up by 8 per cent and that of unskilled labour by 5 per cent?

. . . there is a change in the price and yield in certain raw materials?

. . . the company decides to extend the payment period for goods bought on credit?

Also ask yourself: Is it really possible that cash payments for manufacturing overheads and the cost of selling and distribution could possibly be spread equally throughout the year? As it stands, the cash budget contains too many dummy figures. It pretends to have incorporated many criteria and assumptions which affect the company's cash flow, and yet it cannot provide answers to any of the above questions. This model is therefore not adequate for earnest cash flow planning.

Now imagine a cash flow model which could provide answers to the type of questions posed above. Such a model must inevitably involve more variables and more complex calculations. So how are we at the same time also going to manage to keep it simple? The answer lies in "Thinking Matrix". A matrix is a rectangular or a square array of numbers. Matrices are an invention attributed to the English mathematician Arthur Cayley (1821-1895).

Fortunately you don't need a Bachelor's degree to understand or carry out matrix arithmetic - just elementary knowledge of multiplication and addition. So you should have no difficulty in following the cash flow plan – Exhibit II – and apply the inherent approach and ideas, on a larger scale, to your own models. The plan presented is inevitably only a small part of a master cash flow plan. It is relatively economical with regard to the amount of computer memory that it occupies and can be contained in 48k.

The end result of the cash flow plan is to show the weekly payments for direct labour and material (column 'L' rows 82 to 85), vary from the actual weekly cost for these items (column 'K' rows 82 to 85). The variances are shown in column 'M'. Incorporated in the model, between columns 'A' and 'F', are most of the variables which could affect the weekly production cost and weekly cash payment computations, as well as many other relevant management accounting statements.

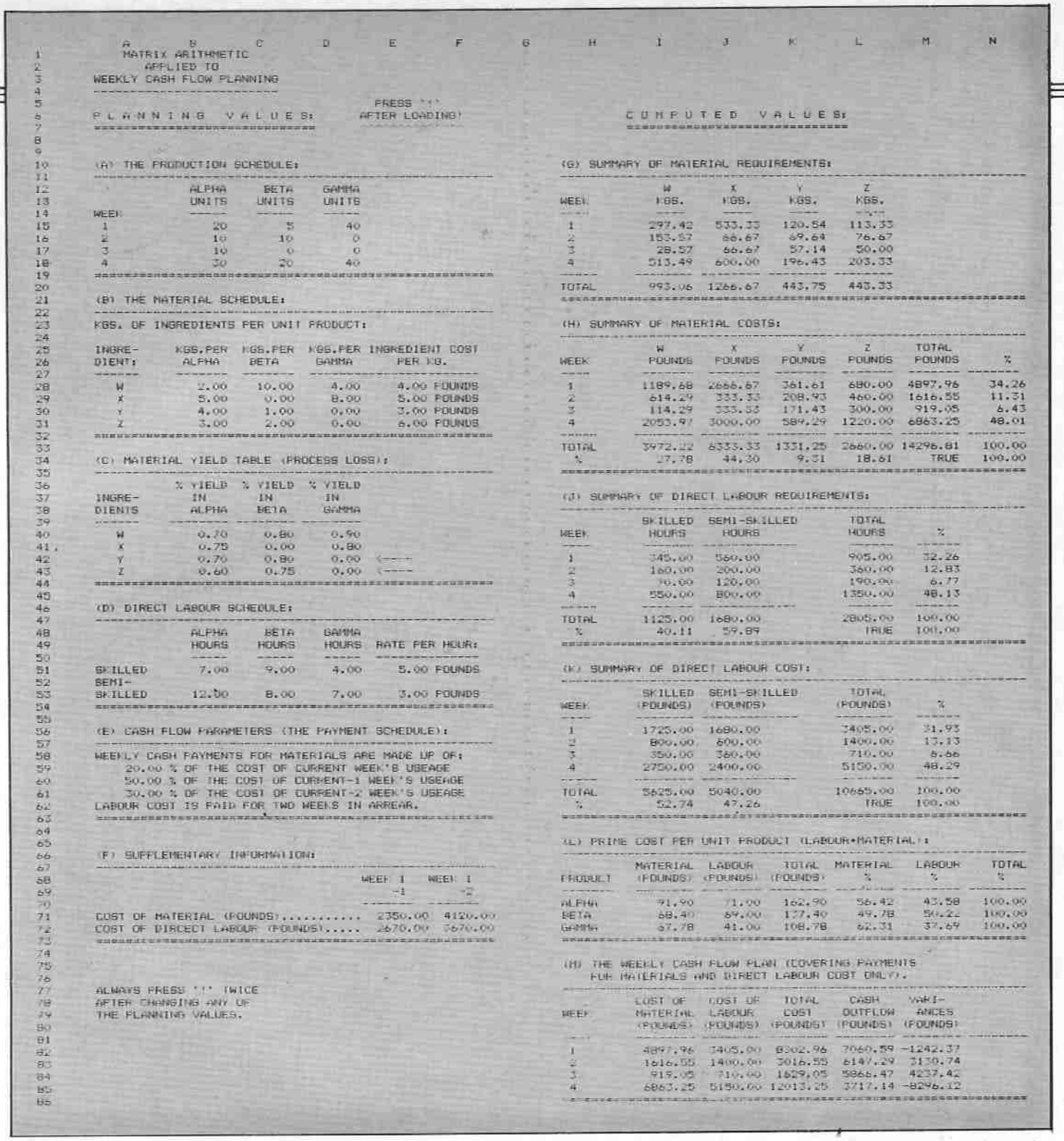
If, for example, it is decided to schedule the production of 40 units of Gamma in week 2 (everything else remaining the same), then by keying-in 40 in cell D16 the computed values of the model will be instantly transformed to the values shown in Exhibit III. The computed values are contained in six management accounting statements. The change made in just one of the planning values has instantly updated the values in 34 cells spread over five management accounting statements (the only unaffected statement is statement 4, prime cost per unit product).

If you want to reproduce this model then start by copying columns A to G. This area does not contain any formulas. Regard copying it as an exercise in the formating of individual cells and in the use of " (page 2-8 in your VisiCalc manual). Try and apply last month's tip to use 'Q ESC' in place of " and see if it makes any difference to the flow of your typing.

Start with /GF$. From now on every figure that you enter and every calculation will appear with two decimal places. But you do not want the production schedule

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
1	CASH BUDGET ('000)																
2	==========																
3						JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
4																	
5	CASH RECEIPTS:																
6	FROM CASH SALES					20	30	40	70	80	100	120	140	110	90	70	50
7	FROM CREDIT SALES					208	205	207	260	360	450	568	602	550	460	370	280
8																	
9	CASH PAYMENTS:																
10	FOR CREDIT PURCHASES					148	125	125	125	125	125	125	125	125	125	125	125
11	DIRECT LABOUR					135	135	135	135	135	135	135	135	135	135	135	135
12	MFG. OVERHEADS					25	25	25	25	25	25	25	25	25	25	25	25
13	SELLING & DITRIBUTION					45	45	45	45	45	45	45	45	45	45	45	45
14	PLANT & EQUIPMENT					250	250										
15	TAXES								154		114			114			113
16	LOAN REPAYMNET										50						50
17	DIVIDENDS							120						120			
18																	
19	TOTAL RECEIPTS					228	235	247	330	440	550	688	742	660	550	440	330
20	TOTAL PAYMNETS					603	580	450	484	330	494	330	330	564	330	330	493
21	RECEIPTS LESS PAYMNETS					-375	-345	-203	-154	110	56	358	412	96	220	110	-163
22	OPENING CASH BALANCE					144	50	50	50	50	50	50	50	50	99	319	429
23	CLOSING CASH BALANCE					-231	-295	-153	-104	160	106	408	462	146	319	429	266
24	MINIM.DESIRED																
25	CLOSING BALANCE					50	50	50	50	50	50	50	50	50	50	50	50
26	OVERDRAFT REQUIREMENTS:																
27	(+)INCREASE (-)DECREASE					281	345	203	154	-110	-56	-358	-412	-47	0	0	0
28	OVERDRAFT OUTSTANDING					281	626	829	983	873	817	459	47	0	0	0	0
29																	

Exhibit I: A typical VisiCalc presentation of a cash budget



MATRIX ARITHMETIC
APPLIED TO
WEEKLY CASH FLOW PLANNING

PLANNING VALUES: (PRESS '!' AFTER LOADING)

(A) THE PRODUCTION SCHEDULE:

WEEK	ALPHA UNITS	BETA UNITS	GAMMA UNITS
1	20	5	40
2	10	10	0
3	10	0	0
4	30	20	40

(B) THE MATERIAL SCHEDULE:

KGS. OF INGREDIENTS PER UNIT PRODUCT:

INGREDIENT:	KGS.PER ALPHA	KGS.PER BETA	KGS.PER GAMMA	INGREDIENT COST PER KG.
W	2.00	10.00	4.00	4.00 POUNDS
X	5.00	0.00	8.00	5.00 POUNDS
Y	4.00	1.00	0.00	3.00 POUNDS
Z	3.00	2.00	0.00	6.00 POUNDS

(C) MATERIAL YIELD TABLE (PROCESS LOSS):

INGREDIENTS	% YIELD IN ALPHA	% YIELD IN BETA	% YIELD IN GAMMA	
W	0.70	0.80	0.90	
X	0.75	0.00	0.80	
Y	0.70	0.80	0.00	<----
Z	0.60	0.75	0.00	<----

(D) DIRECT LABOUR SCHEDULE:

	ALPHA HOURS	BETA HOURS	GAMMA HOURS	RATE PER HOUR:
SKILLED	7.00	9.00	4.00	5.00 POUNDS
SEMI-SKILLED	12.00	8.00	7.00	3.00 POUNDS

(E) CASH FLOW PARAMETERS (THE PAYMENT SCHEDULE):

WEEKLY CASH PAYMENTS FOR MATERIALS ARE MADE UP OF:
20.00 % OF THE COST OF CURRENT WEEK'S USEAGE
50.00 % OF THE COST OF CURRENT-1 WEEK'S USEAGE
30.00 % OF THE COST OF CURRENT-2 WEEK'S USEAGE
LABOUR COST IS PAID FOR TWO WEEKS IN ARREAR.

(F) SUPPLEMENTARY INFORMATION:

	WEEK 1 -1	WEEK 1 -2
COST OF MATERIAL (POUNDS).....	2350.00	4120.00
COST OF DIRECT LABOUR (POUNDS).....	2670.00	3670.00

ALWAYS PRESS '!' TWICE
AFTER CHANGING ANY OF
THE PLANNING VALUES.

COMPUTED VALUES:

(G) SUMMARY OF MATERIAL REQUIREMENTS:

WEEK	W KGS.	X KGS.	Y KGS.	Z KGS.
1	297.42	533.33	120.54	113.33
2	153.57	66.67	69.64	76.67
3	28.57	66.67	57.14	50.00
4	513.49	600.00	196.43	203.33
TOTAL	993.06	1266.67	443.75	443.33

(H) SUMMARY OF MATERIAL COSTS:

WEEK	W POUNDS	X POUNDS	Y POUNDS	Z POUNDS	TOTAL POUNDS	%
1	1189.68	2666.67	361.61	680.00	4897.96	34.26
2	614.29	333.33	208.93	460.00	1616.55	11.31
3	114.29	333.33	171.43	300.00	919.05	6.43
4	2053.97	3000.00	589.29	1220.00	6863.25	48.01
TOTAL	3972.22	6333.33	1331.25	2660.00	14296.81	100.00
%	27.78	44.30	9.31	18.61	TRUE	100.00

(J) SUMMARY OF DIRECT LABOUR REQUIREMENTS:

WEEK	SKILLED HOURS	SEMI-SKILLED HOURS	TOTAL HOURS	%
1	345.00	560.00	905.00	32.26
2	160.00	200.00	360.00	12.83
3	70.00	120.00	190.00	6.77
4	550.00	800.00	1350.00	48.13
TOTAL	1125.00	1680.00	2805.00	100.00
%	40.11	59.89	TRUE	100.00

(K) SUMMARY OF DIRECT LABOUR COST:

WEEK	SKILLED (POUNDS)	SEMI-SKILLED (POUNDS)	TOTAL (POUNDS)	%
1	1725.00	1680.00	3405.00	31.93
2	800.00	600.00	1400.00	13.13
3	350.00	360.00	710.00	6.66
4	2750.00	2400.00	5150.00	48.29
TOTAL	5625.00	5040.00	10665.00	100.00
%	52.74	47.26	TRUE	100.00

(L) PRIME COST PER UNIT PRODUCT (LABOUR+MATERIAL):

PRODUCT	MATERIAL (POUNDS)	LABOUR (POUNDS)	TOTAL (POUNDS)	MATERIAL %	LABOUR %	TOTAL %
ALPHA	91.90	71.00	162.90	56.42	43.58	100.00
BETA	68.40	69.00	137.40	49.78	50.22	100.00
GAMMA	67.78	41.00	108.78	62.31	37.69	100.00

(M) THE WEEKLY CASH FLOW PLAN (COVERING PAYMENTS FOR MATERIALS AND DIRECT LABOUR COST ONLY).

WEEK	COST OF MATERIAL (POUNDS)	COST OF LABOUR (POUNDS)	TOTAL COST (POUNDS)	CASH OUTFLOW (POUNDS)	VARIANCES (POUNDS)
1	4897.96	3405.00	8302.96	7060.59	-1242.37
2	1616.55	1400.00	3016.55	6147.29	3130.74
3	919.05	710.00	1629.05	5866.47	4237.42
4	6863.25	5150.00	12013.25	3717.14	-8296.12

Exhibit II: The cash flow plan

(columns B to D rows 15 to 18) to contain two decimal places. So why not go to cell B15 by keying /X>B15 and before making any entry format that cell to Integer with /FI (you don't have to press RETURN after making that command). Continue by replicating that empty cell from B16 to B18. Finally replicate the empty column B15 to B18, from C15 to D15.

Formatting empty cells can save you a lot of work. If you have a column of figures the format of which has to be changed from the VisiCalc global format, then you will have to reformat each individual cell separately. But if you reformat one cell while it is still empty followed by replicating the format down the empty column, then every figure entered into that column will automatically resume the correct format.

You may be wondering why it was recommended earlier to key /X before the B15 (GOTO B15) command. The reason for this was, as you may have noticed, to bring cell B15 to the top left hand corner of your screen. Every time you press/X before entering the GOTO command, you will get your destination cell appearing in the top left hand corner of your screen. (Don't look up your VisiCalc manual or reference card. They do not make any reference to the/X command.)

Although entering the planning values should be fairly straightforward, you will discover more about how VisiCalc works when you consider the following entries:

Did you notice that there are yield figures appearing in cells C41, D42 and D43 although ingredient X is not used in Beta, and ingredients Y and Z are not used in Gamma (see table B, Material Schedule, Row 21). So why were these spaces not left blank or zero? The calculations in the model involve multiplying and dividing matrices (tables), so it is inevitable that some of the calculations will involve dividing zero by zero. When this happens VisiCalc gets confused and replies ERROR. The same message will then also appear in every cell which is linked to the cell with the original ERROR message.

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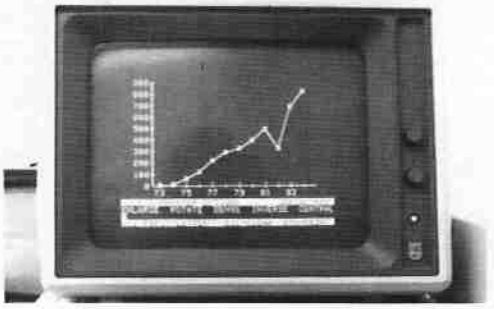

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problem is to write the ERROR vulnerable formula:

@IF (@ISERROR (.....) ,0, (.....)) where (.) contains the formula which could give rise to the ERROR message.

What the above formula states is: If a certain calculation produces an ERROR message insert a zero; if it doesn't produce an ERROR message enter the result of the calculation. If you get an ERROR message which doesn't arise from dividing zero by zero, then it is a genuine ERROR and cannot be overwritten.

Another way of overcoming the ERROR message arising from dividing zero by zero is to make the denominator in the formula any number other than zero. It doesn't make any difference to the results, although the model will show data where there should be a blank.

Note that the % sign in rows 59, 60 and 61 appears in column B, not in Column A, and that cells A59, A60 and A61 must be Value cells. The data in row 71 and 72 columns E and F refers to historic data prior to the start of the production schedule which begins in week one.

We shall now consider some of the formulas in the computed value section (column H to N). The 297.42 in cell I15 denotes how many kilograms of the ingredient W will be required in week one. All the three products scheduled for production in week one require different amounts of W. Note also that the yield of W is different with respect to each product. So the formula in cell I15 is:

B15xB28 ÷ B40 + (C15 x C28 ÷ C40) + (D15 x D28 ÷ D40).

This formula can then be replicated in cells I16, I17 and I18. A similar formula would have to be worked out for cells J15, K15 and L15 and replicated from line 16 to 18.

The formula in cell I28 is E28 x I15, and the formula in cell I42 is: B15 x B51 + (C15 x C51) + (D15 x D51). The formula in cell L85 is I85 x A59 ÷ 100 + (I84 x A60 ÷ 100) + I83 x A61 ÷ 100) + J83.

I trust that the above few clues will give you a fair idea of how the rest of the computed values were calculated. If you don't wish to enter such lengthy formulas in each cell you will need to make the most of the VisiCalc Replicate command, so brush up on your '/R'.

Finally I hope that you will not let the effort involved in developing such modules discourage you. Just imagine the reams of paper and the long, laborious working hours that you can save by using such models. So start thinking matrix and get your answers instantly.

★ ★ ★

Following last month's announcement in *Windfall* on the availability, for the first time in the UK, of the 80 column VisiCalc (see July issue page 51), I received a call from Jeremy Ensor of Village Computer Services, informing me of another utility disc also new on the UK market, which can produce 80 column VisiCalc on a screen.

H I J K L M N

COMPUTED VALUES:

(G) SUMMARY OF MATERIAL REQUIREMENTS:

WEEK	W KGS.	X KGS.	Y KGS.	Z KGS.
1	297.42	533.33	120.54	113.33
2	331.35	466.67	89.64	76.67
3	28.57	66.67	57.14	50.00
4	513.49	600.00	196.43	203.33
TOTAL	1170.83	1666.67	443.75	443.33

(H) SUMMARY OF MATERIAL COSTS:

WEEK	W POUNDS	X POUNDS	Y POUNDS	Z POUNDS	TOTAL POUNDS	%
1	1189.68	2666.67	361.61	680.00	4897.96	28.80
2	1325.40	2333.33	268.93	460.00	4327.66	25.44
3	114.29	333.33	171.43	300.00	919.05	5.40
4	2053.97	3000.00	589.29	1220.00	6863.25	40.35
TOTAL	3972.22	8333.33	1331.25	2660.00	14296.81	100.00
%	27.78	44.30	9.31	18.61	TRUE	100.00

(J) SUMMARY OF DIRECT LABOUR REQUIREMENTS:

WEEK	SKILLED HOURS	SEMI-SKILLED HOURS	TOTAL HOURS	%
1	345.00	560.00	905.00	27.89
2	320.00	480.00	800.00	24.65
3	70.00	120.00	190.00	5.86
4	550.00	800.00	1350.00	41.60
TOTAL	1285.00	1960.00	3245.00	100.00
%	40.11	59.89	TRUE	100.00

(K) SUMMARY OF DIRECT LABOUR COST:

WEEK	SKILLED (POUNDS)	SEMI-SKILLED (POUNDS)	TOTAL (POUNDS)	%
1	1725.00	1680.00	3405.00	27.6
2	1600.00	1440.00	3040.00	24.61
3	350.00	360.00	710.00	5.75
4	2750.00	2400.00	5150.00	41.85
TOTAL	6425.00	5880.00	12305.00	100.00
%	52.21	47.79	TRUE	100.00

(L) MAINE COST PER UNIT PRODUCT (LABOUR+MATERIAL):

PRODUCT	MATERIAL (POUNDS)	LABOUR (POUNDS)	TOTAL (POUNDS)	MATERIAL %	LABOUR %	TOTAL %
ALPHA	91.90	71.00	162.90	56.42	43.58	100.00
BETA	68.90	69.00	137.90	49.78	50.22	100.00
GAMMA	67.78	41.00	108.78	62.31	37.69	100.00

(M) THE WEEKLY CASH FLOW PLAN (COVERING PAYMENTS FOR MATERIALS AND DIRECT LABOUR COST ONLY).

WEEK	COST OF MATERIAL (POUNDS)	COST OF LABOUR (POUNDS)	TOTAL COST (POUNDS)	CASH OUTFLOW (POUNDS)	VARI-ANCES (POUNDS)
1	4897.96	3405.00	8302.96	7060.51	-1242.45
2	4327.66	3040.00	7367.66	6689.51	-678.15
3	919.05	710.00	1629.05	7222.05	5592.98
4	6863.25	5150.00	12013.25	6170.4	-5842.78

Exhibit III

This latest utility disc is labelled Videx VisiCalc Pre-Boot, and it has to be used in conjunction with the Videx Videoterm card. It will enable you to have 80 column VisiCalc on your screen just as if you had acquired VC-Expand/80.

So what's the difference? First of all in the price! The Videx pre-boot disc at around £35 is less than half the price of VC-Expand/80. But this does not mean the end of the VC-Expand/80 disc.

Expand/80 utilises the Videoterm card to give you an extra 16k memory for your VisiCalc models – a facility *not* available with the Videx Pre-Boot disc.

Which to use? In my opinion it all depends on the memory capacity of your Apple. If you do not think that you will have to increase its memory from its present 48k, then the Videx Pre-Boot disc is for you. But you will only have 15k memory for your VisiCalc models.

If you have, or intend to increase, your Apple's memory to 64k or 80k, then an extra 16k memory could be critical, and you will be better off with VC-Expand/80.

Finally, if you have or intend to increase your Apple's memory by a further 128k plus, then only on rare occasions would your VisiCalc models be short of 16k memory, so you could find the Videx Pre-Boot disc adequate for your applications.

● *Readers wishing to receive the listing of the formulas used to produce Exhibit II should send an SAE (minimum size 11cm x 22cm). A disc with the models used in this series will be issued later this year.*

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Formatting's the name of the game

By BARBARA and CHARLES ENGLISH

PASTEXT II is a program developed by Ronny Klaeboe for the Norwegian Software House (Programvarehuset). As its name indicates, it is based on the UCSD Pascal operating system; it has been in use in Norway for 18 months, and there is now an English version. At present Pastext II is geared to the Centronics 737 and 739 printers, and in this version some of the advantages of the program are only available to those with these printers, but there are plans to make customised versions for other printers. Add-ons that are, or will be, available, are Pasmail, Pascolumn, Pasindex and Passpell, the uses of which are self-evident.

To use Pastext II you need, according to the user manual, a minimum of an Apple II with language card (64k), UCSD Pascal system, 1 disc drive, 1 monitor or TV + RF modulator and a printer and interface card. You build your own Pastext system disc by transferring to a formatted blank disc, Pascal and its miscinfo, editor and filer systems from the UCSD Pascal disc and Pastext code and point table from Pastext II's disc. The resulting system disc is then used for both the editing and formatting of text.

The crafty reader will by now be muttering to himself "But where's the word processor?" – and that's the key question. For Pastext II is not, and never claims to be, except perhaps by the implication of its name, a word processor. It is exclusively a program for formatting text, and as such a new development for Apple users, for previous programs such as Format 80, Textmaster and Wordstar (all reviewed in Windfall) have combined word processing with formatting.

If you run the program on the minimum equipment suggested you will not, for instance, be able to print on the screen a mixture of true upper and lower case letters, nor will you be able to see the whole 80 or more column page at once, but you will have to scroll or toggle horizontally in the normal Pascal fashion. So you are really going to need, in addition to the UCSD Pascal system and Pastext II, an 80-column card or terminal, with an upper/lower case input, and, to deal with long texts, another disc drive (more of that later).

The processing of text by the program is carried out in two phases. First the material forming the text is typed and edited by means of the UCSD Pascal editor. When the text itself, plus format instructions, is flawless, then the program Pastext II interprets the instructions, formats the text and sends it to the printer.

In the world of formatting text on computers for printers there are two alternatives. One enables you to check the results on the screen before you print, as Wordstar does. The other alternative, which Pastext follows, is to add the formatting instructions to the text, each command on a separate line, and await the printed result. Which of these alternatives you prefer is up to you. There does seem to be a fundamental division between two kinds of people here. Personally I find it very difficult to gauge the effect of a page unless I see it; but others may be better visualisers. In our early experiments we got some amazing, and useless, output (they grow a lot of trees in Norway).

Pastext provides a full range of text formatting options, with more than 100 commands. The commands all begin with a full-stop ('.') in column 1, followed by the command code (a sequence of two letters, which are fairly easy to remember, because they are mnemonics) and, depending on the command, one space and a parameter: for instance, '.tb 6' means 'tab to 6th standard column'. Fig. 1 shows part of a page from the complete command summary, and Fig. 2 shows a page of text with the Pastext commands added. The formatting commands offered by Pastext seem comprehensive, and once the format is drawn up execution of the program is fast and easy.

Scientists or government officers used to writing the kind of report where each chapter, section and subsection is numbered, and each follows a rigid routine of type of heading and indentation, would find that Pastext, once set up, would do the formatting automatically and save them a great deal of work. The only limitation of the program seems to be one of text length, for once the relevant files have been transferred to the Pastext system disc only 98 blocks (49k) are left out of 280 blocks (140k). It is apparently possible, but very tricky, to get more space for the text files by a manoeuvre described in the reference manual, which is only recommended for the very experienced.

Pastext II comes with two manuals, the user manual (22 pages) and the reference manual (72 pages). Both of these should be revised, for they contain careless mistakes which would be slated in the work of a first year student and should never occur in a program offered for sale. It is not a failure of translation from Norwegian to English, for the English is excellent, and the odd occurrences of such words as "of" for "off" and "too" for "to" are probably only spelling mistakes.

The user manual takes too many short cuts; for instance it contains instructions for making a Pastext system disc on one drive, but there is no reference to the need to change the discs two-thirds of the way through. This problem was solved almost immediately: it took us longer to realise that all files that had to be transferred needed a prefix, namely the volume name of the discs on which they were stored. For users accustomed to the superb Apple manuals, it is disconcerting and infuriating to find that if you follow the Pastext user manual *exactly,* nothing happens, for you need to add extra detail, which the manual expects you to find out yourself.

The reference manual is divided into the command subset summary (those commands most frequently used) followed by the complete command summary. The command subset is then described more fully, followed by a fuller description of the complete commands. A common command such as line length (.ll) is therefore dealt with four times in the text in different terminology. In addition the command is indexed whenever it occurs in the manual (even in one of the author's examples) for the index function,

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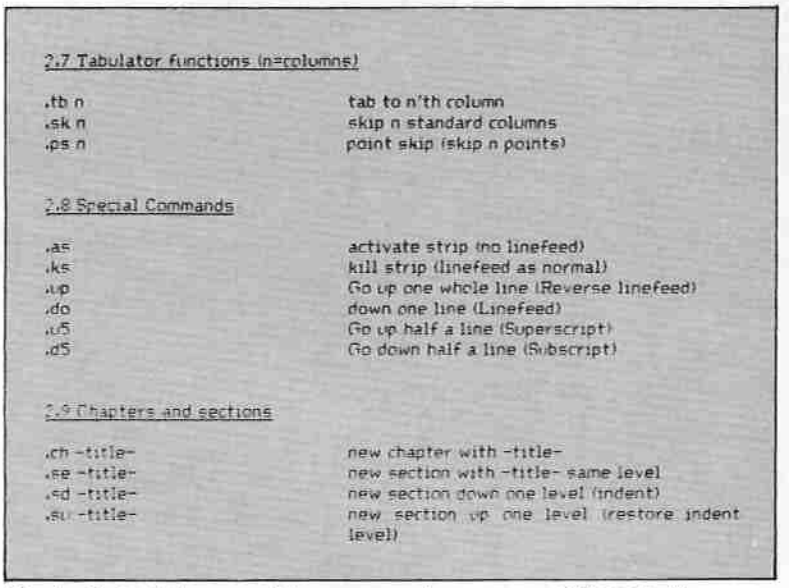
once activated, is all-embracing. If, for instance, you had unfortunately forgotten what '.ll' meant, you would be faced with seven page references in the index, four of them being references to definitions and three to examples. There is no alphabetical list of commands apart from the index, it is limited to the commands only, except for the occasional joker which has crept in from the examples (I suggest you look up "Apple User Group" in the index, refer to the text, and meditate on the problems of an automatic indexing system).

Both manuals were made using Pastext II. Perhaps the formatting instructions for the reference manual were too complex even for the author, because they break down on Page 51, and subsequent pages in the manual are given the wrong running head, are wrongly paged in the contents and wrongly numbered in the index. There are other mistakes in the text of the reference manual, for instance in the instructions for using the alphabetical marker and lexical index, and there are errors in the running heads of the user manual.



2.7 Tabulator functions (n=columns)

.tb n	tab to n'th column
.sk n	skip n standard columns
.ps n	point skip (skip n points)

2.8 Special Commands

.as	activate strip (no linefeed)
.ks	kill strip (linefeed as normal)
.up	Go up one whole line (Reverse linefeed)
.do	down one line (Linefeed)
.u5	Go up half a line (Superscript)
.d5	Go down half a line (Subscript)

2.9 Chapters and sections

.ch -title-	new chapter with -title-
.se -title-	new section with -title- same level
.sd -title-	new section down one level (indent)
.su -title-	new section up one level (restore indent level)

Fig. 1. Part of the complete command summary of Pastext II.

Conclusions

- Pastext II is a comprehensive text-formatting system based on the UCSD Pascal editor and filer. It operates on the "you don't see it" approach – you add formatting commands to an edited text and await results.
- The manuals are very poor and need reorganising and in some sections rewriting.
- To use Pastext II you need the Pascal system and for ease of use an 80-column card and an upper and lower case facility. Pastext II itself costs £80-£90. If you already have most of the equipment, and write many technical and scientific reports with strict rules of format, you might find Pastext II helpful. Otherwise you might think the total cost too high for a program to format text.

Ronny Klaeboe, of Programvarehuset, replies to the review:

I WOULD like first of all to thank Barbara and Charles English for their thorough review of Pastext II. They have pointed out a bug in the running headers and a bug in the page numbering – these are now corrected. They have also pointed out some mistakes in the documentation of the automatic index (a feature we added at the last moment). These errors have been corrected.

A couple of their criticisms have given rise to valuable additions to Pastext: 1. You may have an automatic table of contents without automatic numbering; 2. The automatic indexing may be set to ignore repetitions.

I think these additions will give Barbara and Charles English the added flexibility they require in order to benefit from the automatic table of contents, and the automatic indexing.

They are mistaken in the length of the source file you may output using one drive. Without resorting to tricks the correct number of blocks should be 200 or about 50 pages, as you don't normally need all files on the system disc.

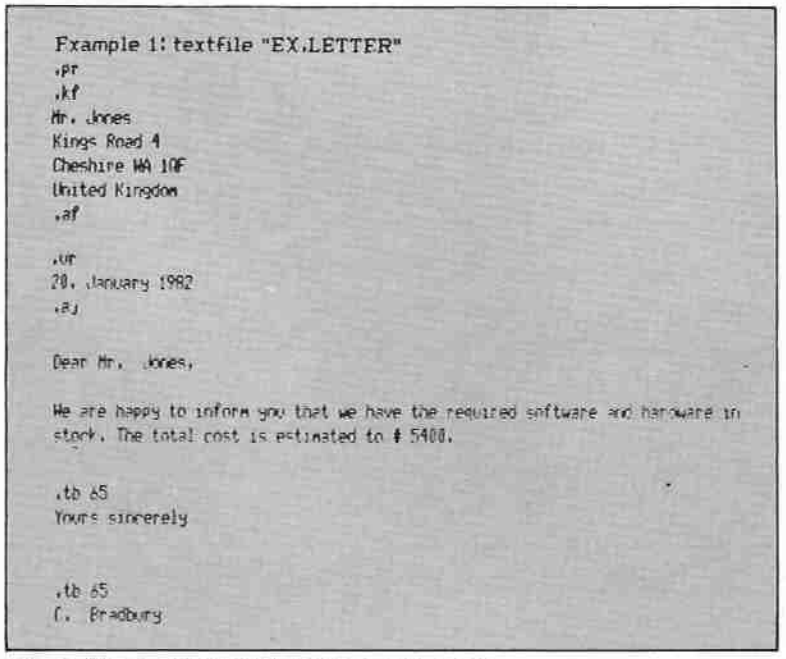
If you make room for the index and table of contents on your main disc you may link several discs with source files. If you have only one disc drive system, Pascal and Pastext code must be found in exactly the same place on all discs. This is not necessary when you have two disc drives. (This quirk has to do with the Pascal system, and is not special for Pastext II.)

In spite of the errors pointed out by Barbara and Charles English, I disagree with them about the quality of the manuals. To quote an independent review by Peter Scott BSc (Eng) of DCAN Computing Ltd:

'The documentation is of an extremely high standard. If there is one facet of Pastext II which raises it far above other comparable systems – this is it'.

The user manual defines Pastext II as a valuable addition to the UCSD-Pascal system.

Pastext II was never meant to be a standalone word processing system. If Pastext II is evaluated as an addition to the UCSD-Pascal system it is our opinion that there are none comparable in quality or in the amount of functions offered.



```
Example 1: textfile "EX.LETTER"
.pr
.kf
Mr. Jones
Kings Road 4
Cheshire WA 10F
United Kingdom
.af

.ur
20. January 1982
.aj

Dear Mr. Jones,

We are happy to inform you that we have the required software and hardware in
stock. The total cost is estimated to # 5400.

.tb 65
Yours sincerely


.tb 65
C. Bradbury
```

Fig. 2. Page of text with Pastext commands

Interrupting the Apple

By Dr JOHN LITTLER
University of Bristol

HAVING set up an IRQ routine to read data from, for example, a serial communication interface, what do we do with it? Clearly it must be stored until the main program can deal with it, and the main program must be told when enough data has come in to make it worth processing. It may also be necessary to echo the data to the remote terminal or computer.

The simplest operation here is to reserve a buffer area in RAM, and to write the data into successive locations. A count must be maintained of the next free location, and a specific location must be altered to act as a flag to the main program to tell it when the message is complete, such as when a RETURN is seen. The main program can then read the data out at its own speed when convenient.

Clearly the size of the buffer and the complexity of the software depend critically on the application and on how long it is intended to store the information before it is processed. Similar considerations apply if the main program fills the buffer and the interrupt routine sends it out as required to a printer, etc.

If there are multiple sources of interrupts the routine must determine which device causes the current one, such as by reading the device status register, and it must transfer the data to the correct buffer.

One important requirement of the service routine is that it should remove the cause of the interrupt. This is usually done automatically by reading or writing to a peripheral register, but if it is not done a new IRQ routine will take place immediately the first one's RTI has been executed, and the computer will apparently go dead with the main program making no progress.

Fortunately the RESET is at higher priority and so this gives us a way of recovering, particularly as it usually also sets the interrupt disable bit and resets the peripheral device status registers. After a RESET you must therefore go through the set-up routines again.

If there are two simultaneously interrupting devices, clearing one will leave the other in operation, and if they are on the NMI line the second one will not be seen (only one transition has been seen). It is therefore inadvisable to have two devices simultaneously active on the NMI.

On the IRQ line, however, the low value of the signal will continue until all causes have been cleared. If we require one IRQ interrupt to have a higher priority than another, even if the lower one occurs first, we must ensure that the first interrupt can itself be re-interrupted.

This is easily achieved by including a CLI instruction in the routine, near the beginning but after the accumulator value has been recovered from ACC, and obviously after it has checked that it is not already dealing with the higher priority source of interrupts.

It is possible to provide as many levels of software priority between IRQ interrupts as one wishes, but in practice one rarely handles more than one level of priority in IRQ. It is of course necessary to deal with software priorities if the system monitor also uses the interrupt system, as in the Apple III.

It is also possible to use the INT IN and INT OUT pins on the peripheral interface connectors to control the priorities of various interrupting devices by the slot position. These lines are "daisy-chained" from one slot to the next, but not connected to anything. If two peripheral cards use these correctly the slot number determines the priority of two interrupt generating cards.

A higher priority card (lower slot number), when interrupting will send INT OUT low, and so will prevent a lower priority card from generating an interrupt, while a lower priority interrupt routine will be itself interrupted.

The cards must not be separated by an empty slot or one containing a card in which INT IN and INT OUT are not linked either directly or by appropriate gates.

A brief note about other high level languages. If they still use the F800 ROM the technique will be as described above, but if they use a RAM card the vectors will be in RAM and can be altered directly, with the user being entirely responsible for sorting out breaks, storing registers etc.

However, if a machine code routine must be relocatable (as in UCSD Pascal), it will be necessary to use subroutines which are compiled and linked to refer both to the absolute addresses of the vectors and I/O hardware and to the relocatable positions of any data buffer areas.

The following listings give an example of a short program designed to read an 8-bit data word from the "A" side of a 6820 or 6821 PIA addressed at $C0A0, such as in the A10 card set in slot No. 2, when a signal on the CA1 line has caused an interrupt to show that the data is true. The binary files must first be loaded, and then the Basic program loaded and run. The initialisation routine at $300 is called by line 5 of the Basic.

It should be noted that reading the data register of the 6820 is necessary to remove the IRQ signal, whether or not the data is needed, and that the maximum rate at which interrupts can be counted is considerably faster than the rate at which the Basic can display the values.

As the program does not include a BRK command and only needs to use the accumulator, the recovery of the accumulator from location $45 is left to the end, and no stack storage is needed.

The minimal circuit needed to generate

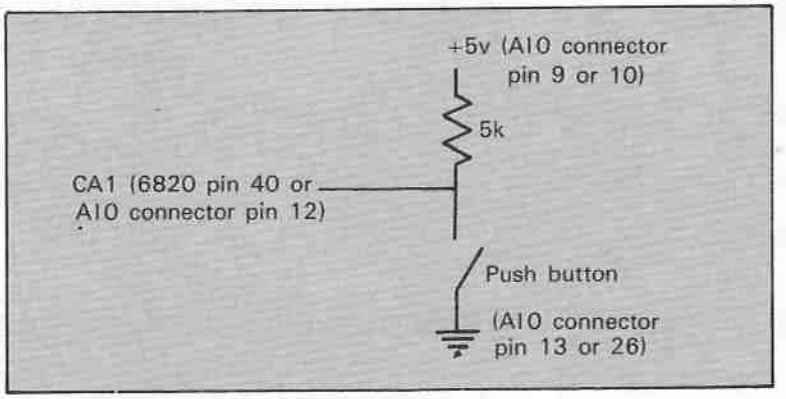


Fig. 1.

the interrupt is shown in Fig 1.

The modification to the A10 board to link in the interrupt is shown in Fig 2.

The two holes provided on the board are marked R.

One possible use of the NMI function is to use it to break into a program to find where it is operating, and then to allow a return to the program. If the following code is inserted into Page 3, and the NMI line is pulled low by means of a debounced pushbutton, the values of the program counter and registers will be displayed whenever the pushbutton is pressed.

Monitor commands are then available (such as to disassemble the code being run), and the program can be restarted by the CTRL-Y function. If the value of the stored program counter pointer is altered by the monitor commands it must be re-entered as part of the CTRL-Y command.

If the machine has an old type (non-autoboot) ROM the byte at 303 should be 92, and the "step" function can be used as required before the program is resumed by CTRL-Y.

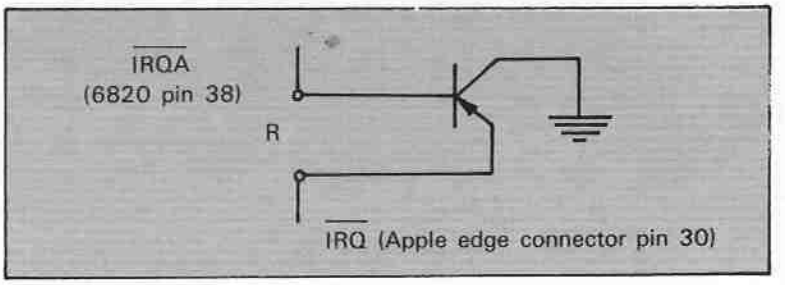


Fig. 2.

This code may occasionally cause a corruption of a program since in order to use monitor functions it uses SAVE and RESTORE and the display routines which the program may also be using. But the essential thing to avoid is pressing the button while the disc is writing, since this will cause corruption of a track or even of a directory!

● *To be continued*

Programme for Nm1 Trace Operation

```
300   85 45       STA $45
      4C 4C FA    JMP $FA 4C   BREAK routine
305   68          PLA          tidy up stack
      68          PLA          tidy up stack
      4C B6 FE    JMP $FE B6   GO routine
3F8   4C 05 03    JMP $305     CTRL-Y vector
      4C 00 03    JMP $300     NMI vector.
```

```
5  CALL 768: REM  INITIALISE INTERFACE
10 NCOUNT =  PEEK (896)
20  IF NCOUNT = OLDCOUNT GOTO 10
30  PRINT NCOUNT,"      ";
40 OLDCOUNT = NCOUNT
60  PRINT  PEEK (897): REM  VALUE ON INPUT LINES
80  GOTO 10

SOURCE FILE: INTS
----- NEXT OBJECT FILE NAME IS INTS.OBJ0
0300:             1          ORG  $0300      SAFE AREA IN BASIC
C0A0:             2 BASE     EQU  $C0A0      CARD IN SLOT 2
0380:             3 COUNTER  EQU  $380       COUNT INTS HERE
03FE:             4 VECTR    EQU  $3FE
0300:A9 40        5          LDA  #$40       SET UP NEW VECTOR
0302:8D FE 03     6          STA  VECTR
0305:A9 03        7          LDA  #$03
0307:8D FF 03     8          STA  VECTR+1    BOTH BYTES
030A:A9 00        9          LDA  #$00                        ;
030C:8D A1 C0    10          STA  BASE+1      SET UP PIA      ;
030F:8D A0 C0    11          STA  BASE          FOR INPUT
0312:8D B0 03    12          STA  COUNTER    CLEAR COUNT AT START
0315:A9 05       13          LDA  #$5            SET CONTROL REG PIA TO SENSE NEG EDGE
                                                 ON CA1 AND INTERRUPT
0317:8D A1 C0    14          STA  BASE+1
031A:AD A0 C0    15          LDA  BASE       MAKE SURE NONE AT START
031D:58          16          CLI             TURN INTS ON
031E:60          17          RTS             INITIALISE COMPLETE
----- NEXT OBJECT FILE NAME IS INTS.OBJ1
0340:            18          ORG  $0340      ACTUAL INTERRUPT ROUTINE
0340:EE B0 03    19          INC  COUNTER    COUNT INTERRUPTS
0343:AD A0 C0    20          LDA  BASE .     READ INPUT AND CLEAR IRQ
0346:8D B1 03    21          STA  COUNTER+1  SAVE DATA
0349:A5 45       22          LDA  $45        RECOVER ACC
034B:40          23          RTI             RESUME MAIN SEQUENCE

*** SUCCESSFUL ASSEMBLY: NO ERRORS
```

Slow, perhaps, but the wait's worth while

By T.N. THOMPSON

WITH the number of database and information management systems available at the moment, the introduction of a Pascal based system, priced at the upper end of the market, seemed a little improbable to me.

Omnis is an information management system for the Apple from Blyth Computers. It comes in a handy sized ring binder, containing a single disc and the user manual. It may be used with 40 or, by simply pressing ESC W, on 80 column displays.

I use a 64k Apple with two 5¼in discs but there are systems available for all Apple systems from 48k Apple IIs (without the language card), through Apple IIs with hard discs to a 256k Apple III with 40 mbyte of replaceable cartridge discs.

Although only one disc is supplied, at least three others are required to set up a database – a copy of the master (copying IS recommended in the manual), one to hold the configuration of the databases and at least one disc to hold the data. Written in Pascal, this leaves the user with a certain amount of disc swapping, or needing three 5¼in disc drives or a hard disc.

With two drives the package prompts for the correct discs to carry out different tasks. However on one occasion after mounting the wrong disc in response to the prompt the program immediately wiped clean the configuration disc, which left ALL the database configurations on that disc unobtainable to Omnis. If I hadn't made back-up copies of the configuration and data discs I would have effectively lost all the data on the databases. (However there is a free update that fixes this bug – see below.)

The user manual is only 38 pages long, but is well written for the technical user, containing all the information needed to set up and run databases. In fact the only criticism of the manual I could level is the lack of an index and proper examples. The manual does seem quite technical, and could give an end user without any computer expertise some problems. There is a new manual in the pipeline which present users should soon receive, aimed at the non-technical user which should do away with these criticisms.

The package itself is a suite of programs, and is menu driven for all sections. As a result its operation is very easy. On booting the package you are prompted for the configuration disc, which then allows you to either select an existing database configuration or set up a new one.

Once designed, setting up and formatting a database is very easy. You are first asked how many screens of data per record you will require. A screen is just what it says, a blank screen on which you format a section of the record. Once the number of screens has been selected you are then taken to the set up menu. This is laid out in the best order for setting up the database, and is very easy to use, with powerful editing facilities.

The database is set out onto the screen(s), entering fields as and when desired. The number of types of fields available should meet just about everybody's needs. Mistakes in the layout or order can be easily corrected. However once set up and data entered, the length and type of fields cannot be altered until the promised Omnis Utilities Package is released, without risking rendering the data previously entered unobtainable to the database, so that the data must be re-entered by hand.

There are sections in the menu that let you send Ascii character strings to the printer for different line lengths, character sets, etc., set the number of records the user requires and set passwords for access to the database (three levels of access are supported – read only, read and write only, full access).

Once the database has been set up Omnis takes you to the main menu. If you are using an existing database you start at this point. Databases, date, password, and data discs can be changed from this menu. You can also amend the screen layout, but this is solely for display purposes, as the same problem with altering the record length applies. However at this level the program will not allow you to alter the fields.

Another option is the formatting and printing of reports. These options permit the formatting of reports, a thing at which Omnis excels. The formatting is as easy as setting up a database screen, using similar editing facilities and the same blank screen starting point. With it, using a free format and small amounts of data from the database is as easy as printing a vast mailing list with 20 labels per record, together with a conditional headed financial report.

As well as the editing of reports, you can search the database for the necessary records using up to 51 fields, 10 can be indexed, all of which can perform various criteria calculations; sort the records by 9 fields, none need be in the report; and calculate totals, selecting whether to print them every page or once only. All sections of the report may be a mixture of free text and fields, that is fields from the database, calculated fields and report fields. Once formatted, the report can be saved onto or loaded from the configuration disc for future use, when it can just as easily be altered to take account of different needs, saving time and effort.

When printing a report the search and sort procedures can take a long time to complete, especially if the sort fields are not indexed. However the scope of the reporting facilities is truly vast and is well worth the loss of speed. No matter what Omnis is being used for, a report can be tailored to the exact requirements.

The database maintenance is nearly as extensive. It is possible to insert, delete and edit individual records. In addition it uses the same search and sort facilities as the reporting section, and it is possible to do global alterations, updates, and deletions. These can range from simple changes to fields in selected records to global calculations and alterations on sorted records or the whole database.

On the whole Omnis deserves the title Information Manager. With its easy set up and powerful reporting facilities it should find its way into a wide range of applications from stock control to mailing lists and libraries.

There are some faults though. The program's error checking is not bullet proof. When I crashed the configuration disc the only thing I'd done wrong was to put the disc in the wrong drive. To make matters worse, the program then dumped me into the Pascal operating environment with the usual uninformative error message and thence to the Pascal command line. The average user doesn't want to know anything about what goes on inside, and should *never* see a program's operating environment. Once set up, the database cannot be expanded to take account of changing needs for it.

Having said that, Blyth Computers provide an excellent and helpful back up service which includes free updates to registered users. This includes program and documentation changes. If a user has any problems with Omnis, the solution is usually a phone call away. This includes continual development of the package, of which the latest include additional routines to stop the configuration disc crashing, and, in the near future, a set of utilities to allow the extension of existing databases to meet expanding needs.

With these problems sorted out, Omnis is a very good Information Manager, and I can recommend it to anybody who has to handle and report on data of any volume.

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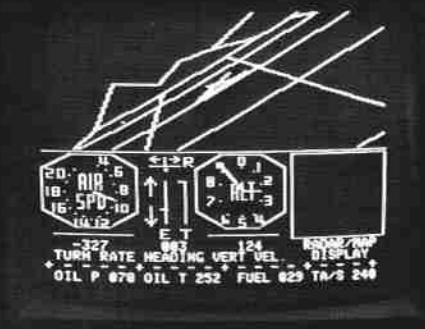

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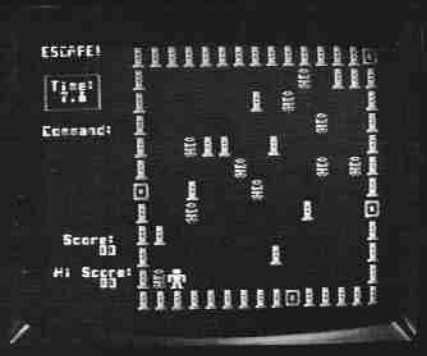

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A melody from your micro

By MICHAEL HAMBLY

MUSIC can be played with relative ease on the Apple with the aid of this program. Although it is packed with REM statements a description of some aspects might be useful.

Machine code routine for notes: This is poked into memory locations 768 to 786 by subroutine 14100 to 14140. (The reason for locating the routine in this part of the program will become apparent later.) The notes can then be generated by poking a 'note' number and 'note length' number into memory locations 6 and 7 followed by CALL 768.

Musical key, notes and note lengths: A total of 255 notes are possible – the range of values that can be poked into memory location 6. But to get a musical scale intervals between numbers based on the Tonic Sol-fa system are needed:

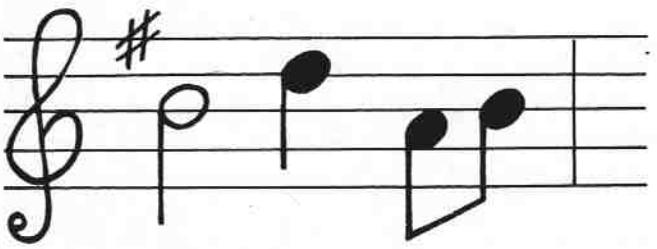
DOH	RAY	ME	FAH	SOH	LAH	TE	DOH
	⌣	⌣	⌣	⌣	⌣	⌣	⌣
	tone	*tone*	*semi-tone*	*tone*	*tone*	*tone*	*semi-tone*

The intervals between note numbers in subroutine 17000 reflect this structure. This means that it would be very awkward to continually change numbers for different keys in order to get semi-tones in the right places. Hence the approach adopted is to stick to the one key (key of Apple?) but to rename the notes according to the key that the music is in (lines 18000-18110).

This key is then printed between the note numbers. It may not be good musically but it ensures that all music will be in tune with a minimum of fuss. The keys of C,G, D and A are included here but more can be added.

The length of a note is also determined by a number in the range 1 to 255 and poked into memory location 7, the larger the number the longer the note. To take tempo into account it is desirable to be able to change the overall speed of a tune without having to change the length of every single note. This is achieved by having a note length number and a tempo number by which all note length numbers are multiplied before the note is played (line 14020).

Example:



This is the key of G, so when the program is run part of the display will look like this:

3rd octave	58	52	46	43	39	35	31	29
Key of G	G	A	B	C	D	E	F#	G

What must then be typed in for this sample can be seen from the following table:

Note	Note number	Note length	Tempo number
B	46	4	Any number less
D	39	2	then 255 ÷ 4
A	52	1	e.g. 10 for a fast tune
B	46	1	50 for a slow one.

The Menu 1000-1170: POKE 33,30 sets screen width to 30 characters, POKE 32,9 moves left margin in nine spaces. (Be careful – doing it the other way round creates havoc.) This saves using TAB 10 for each line of the menu to move menu into screen. Line 1150 resets the screen to normal before proceeding with the program.

The program could be typed in stages. Lines 10-11230, 14000-14140, 17000-18110 and 20000-20010 without REMs would be a good start.

The most useful part of the program is subroutine 21000. Once the rest of the program has been used to enter and test a piece of music this subroutine, by using EXEC, will create a complete music subroutine for this piece of music.

This subroutine will be saved on disc with line numbers beginning at 14000 (the reason for locating the music POKE codes at 14100). It can then be added to any other program and the music played by GOSUB 14000. Incidentally, it is easier to use the RENUM program for building up programs of subroutines rather than EXEC.

```
10 D$ =  CHR$ (4)
20  TEXT
30  DIM NO(200),NL(200)
40  GOSUB 14100
970 :
980  REM  MENU
990 :
1000  TEXT : HOME
1010  VTAB 4: PRINT "ENTER YOUR C
    HOICE OF:-"
1020  POKE 33,30: POKE 32,9: PRINT

1030  PRINT "1: ENTER     MUSIC"
1040  PRINT "2: CORRECT   MUSIC"
1050  PRINT "3: ADD TO    MUSIC"
1060  PRINT "4: PLAY      MUSIC"
1070  PRINT "5: SAVE      MUSIC"
1080  PRINT "6: RETRIEVE MUSIC"
```

TEMPO

```
1090  PRINT "7: MAKE MUSIC SUBROU
     TINE"
1100  PRINT "8: END       MUSIC"
1110  PRINT : PRINT
1120  INPUT "YOUR CHOICE (1-8) ";
     CHOICE
1130 CHOICE =  INT (CHOICE)
1140  IF CHOICE < 1 OR CHOICE > 8
      THEN  PRINT "PLEASE REENTER
     ": GOSUB 20000: GOTO 1120
1150  TEXT
1160  ON CHOICE GOSUB 10000,11000
     ,12000,14000,15000,16000,210
     00,22000
1170  GOTO 1000
9980  REM  ***** ENTER MUSIC ****
     *
10000  HOME :N = 0
10010  GOSUB 18000: REM  WHAT MUS
     ICAL KEY
10020  GOSUB 17000: REM  NOTE NUM
     BERS
10030 V = 19
10040  VTAB V:N = N + 1: PRINT "
      "N;
10050  VTAB V: HTAB 9: INPUT NO(N
     )
10060  IF NO(N) =  - 1 THEN N = N
      - 1: RETURN
10070  IF NO(N) =  - 2 THEN  GOSUB
     13000: GOTO 10110
10075  IF NO(N) < 1 OR NO(N) > 25
     5 THEN 10050
10080  VTAB V: HTAB 18: INPUT NL(
     N)
10090  IF NL(N) * TEMPO > 255 THEN
      PRINT : PRINT "NOTE LENGTH*
     TEMPO MUST BE <255": HOME :N
      = N - 1: GOTO 10040
10100  IF V < 24 THEN V = V + 1
10110  IF N = 201 THEN N = N - 1:
      RETURN
10120  GOTO 10040
10970  REM  ***** CORRECT MUSIC *
     ****
11000  HOME : GOSUB 17000: REM  N
     OTE NUMBERS
11010  VTAB 20
11020  INPUT "PLEASE GIVE TEMPO Y
     OU REQUIRE ";TEMPO
11030  POKE 33,40: VTAB 20: HTAB
     33: PRINT "TEMPO;"";:POKE 33,
     30
11040  VTAB 20: PRINT "31 SPACES"
11050 P = 0
11060 P = P + 1
11070  IF P > N THEN 11210
11080  PRINT "  "P"     "NO(P)"
          "NL(P)
11090  PRINT "DO YOU WISH TO CHAN
     GE THESE?"
11100  GET KB$: IF KB$ = "N" THEN
     11060
11110  PRINT "ENTER NOTE $ NOTE L
     ENGTH"
11120  PRINT "   "P"          ";
11130  HTAB 9: INPUT NO
11140  IF NO =  - 1 THEN  RETURN

11150  IF NO =  - 2 THEN N = P: GOSUB
     13000:P = N: GOTO 11200
11160  IF NO < 1 OR NO > 255 THEN
     10050
11170 : HTAB 18: INPUT NL
11180  IF NL * TEMPO > 255 THEN  PRINT
     : PRINT "NOTE LENGTH*TIME MU
     ST BE<255": GOSUB 20000: HOME
     :P = P - 1: GOTO 11060
11190 NO(P) = NO:NL(P) = NL
11200  IF P < N THEN 11060
11210  RETURN
11970  REM  **** ADD MUSIC ****
12000  HOME
12010  IF NO(1) = 0 THEN  PRINT "
     NO MUSIC IN MEMORY": GOSUB 2
     0000: RETURN
12020  GOSUB 10020: REM  ENTER MU
     SIC
12030  RETURN
12970  REM  **** TO COPY A PIECE
     ****
13000  PRINT "WHAT SEGMENT OF MUS
     IC DO YOU WANT TO COPY ?"
13010  INPUT "FROM ";FROM
13020  INPUT "TO   ";T
13030 D = T - FROM:FROM = FROM -
     1
13040  FOR I = N TO N + D
13050 FROM = FROM + 1
13060 NO(I) = NO(FROM)
13070 NL(I) = NL(FROM)
13080  NEXT
13090 N = I - 1
13100  GOSUB 20000: HOME : RETURN
13970  REM     **** PLAY MUSIC ***
     *
14000  IF NO(1) = 0 THEN  PRINT "
     NO MUSIC IN MEMORY": GOSUB 2
     0000: RETURN
14010  FOR I = 1 TO N
14020  POKE 6,NO(I): POKE 7,NL(I)
      * TEMPO: CALL 768
14040  NEXT
14050  RETURN
14080  REM  ***** POKE CODES FOR
     MUSIC *****
14100  FOR I = 768 TO 786
14110  READ NO: POKE I,NO
14120  NEXT
14130  DATA     173,48,192,136,208
     ,4,198,7,240,8,202,208,246,1
     66,6,76,0,3,96
14140  RETURN
14970  REM  ***** SAVE MUSIC ****
     *
15000  IF NO(1) = 0 THEN  PRINT "
     NO MUSIC IN MEMORY": GOSUB 2
     0000: RETURN
15010  GOSUB 19030: REM   NAME MU
     SIC
15020  PRINT D$;"OPEN";MUSIC$
15030  PRINT D$;"DELETE";MUSIC$
15040  PRINT D$;"OPEN";MUSIC$
15050  PRINT D$;"WRITE";MUSIC$
15060  PRINT KEY$
15070  PRINT TEMPO
15080  PRINT N
15090  FOR I = 1 TO N
15100  PRINT NO(I): REM      NOTE
15110  PRINT NL(I): REM      NOTE
     LENGTH
15120  NEXT I
15130  PRINT D$;"CLOSE";MUSIC$
15140  RETURN
15970  REM  ***** RETRIEVE MUSIC
     *****
16000  GOSUB 19000: REM     NAME O
     F MUSIC
16010  PRINT D$;"OPEN";MUSIC$
16020  PRINT D$;"READ";MUSIC$
16030  INPUT KEY$
16040  INPUT TEMPO
16050  INPUT N
16060  FOR I = 1 TO N
16070  INPUT NO(I): REM        NOT
     E
16080  INPUT NL(I): REM        NOT
     E LENGTH
16090  NEXT I
16100  PRINT D$;"CLOSE";MUSIC$
16120  RETURN
16970  REM  ***** NUMBERS FOR EAC
     H NOTE *****
17000  HOME
17010  PRINT " 3RD OCT  58  52  4
     6  43  39  35  31  29"
17020  PRINT KEY$: PRINT
17030  PRINT " 2ND OCT  116 104
     92  86  78  70  62  58"
17040  PRINT KEY$: PRINT
17050  PRINT " 1ST OCT 232 208 18
     4 172 156 140 124 116"
17055  POKE 34,10
17060  IF CHOICE = 1 THEN  VTAB 1
     8: INPUT "WHAT TEMPO     ";TE
     MPO
17070  VTAB 17: PRINT "
           "
17080  HOME : VTAB 11
17090  PRINT : PRINT "ENTER-1 (IN
      PLACE OF NOTE) TO END ENTRY
     "
17100  PRINT "ENTER-2 TO COPY ANY
      PIECE": PRINT : PRINT
17110  PRINT "NUMBER  NOTE  NOTE
     LENGTH      YOUR "
17120  PRINT "
              TEMPO"
17130  PRINT "
              IS"
17140  PRINT "
              ";TEMPO
17150  POKE 34,18: POKE 33,30
17160  RETURN
17970  REM  *****WHAT MUSIC KEY *
     ****
18000  PRINT "WHAT KEY IS THE TUN
     E IN?"
18010  PRINT : PRINT
18020  PRINT "  A  (3 SHARPS)"
18030  PRINT "  D  (2 SHARPS)"
18040  PRINT "  G  (1 SHARP)"
18050  PRINT "  C  (0 SHARPS)"
18060  PRINT : INPUT "PLEASE TYPE
      A,D,G OR C ";A$
18070  IF A$ = "A" THEN KEY$ = "K
     EY OF A A  B  C£  D E F£  G£
      A": RETURN
18080  IF A$ = "D" THEN KEY$ = "K
     EY OF D D E F£ G A B C£ D":
     RETURN
18090  IF A$ = "G" THEN KEY$ = "K
     EY OF G G A B C D E F£ G":
     RETURN
18100  IF A$ = "C" THEN KEY$ = "K
     EY OF C C D E F G A B C":
     RETURN
18110  PRINT : PRINT "PLEASE REEN
     TER": GOTO 18060
18970  REM  *****  NAME MUSIC  **
     ***
19000  PRINT "DO YOU KNOW NAME OF
      MUSIC (Y/N)?"
19010  INPUT ANS$
19020  IF  LEFT$ (ANS$,1) = "N" THEN
      PRINT D$;"CATALOG"
19030  INPUT "PLEASE ENTER TITLE
     OF MUSIC ";MUSIC$
19050  RETURN
```

```
19970  REM   ***** SHORT DELAY ***
      **
20000  FOR I = 1 TO 3000: NEXT
20010  RETURN
20950  REM  ***** SETTING UP A FI
      LE AND 'EXECING' THAT FILE *
      ****
20960  REM  ***** AND THUS CREATI
      NG A PROGRAM SUBROUTINE TO *
      ****
20970  REM  ***** PLAY A TUNE AND
       BE ADDED TO ANY OTHER PROGR
      AM *****
21000  IF NO(1) = 0 THEN  PRINT "
      NO MUSIC IN MEMORY": GOSUB 2
      0000: RETURN
21010  IF  LEN (MUSIC$) = 0 THEN
       GOSUB 19030
21020  INVERSE : VTAB 23: PRINT "
      PROGRAM "MUSIC$: PRINT " NOW
       BEING MADE ": NORMAL
21030  PRINT D$;"OPEN MUSIC MAKER
      "
21040  PRINT D$;"WRITE MUSIC MAKE
      R"
21050  PRINT "DEL 10,14000"
21060  PRINT "DEL 14140,50000"
21070  PRINT "14000 IF N1=0 THEN
       GOSUB 14100"
21080  PRINT "14197:"
21090  PRINT "14198 REM ***** NOT
      ES FOR MUSIC *****"
21100  PRINT "14199:"
21110  PRINT "14200 READ MUSIC$,T
      EMPO,N"
21120  PRINT "14210 DIM NO(N),NL(
      N)"
21130  PRINT "14220 FOR I= 1 TO N
      "
21140  PRINT "14230 READ NO(I),NL
      (I)"
21150  PRINT "14240 NEXT"
21160  PRINT "14250 N1=1"
21170  PRINT "14260 RETURN"
21180  PRINT "14270 DATA";
21190 NU = 14280:I = 1
21200  PRINT MUSIC$",";TEMPO",";N

21210  PRINT
21220  PRINT NU"DATA";
21230  PRINT NO(I)",";NL(I)",";
21240  IF I / 30 <  > INT (I / 3
      0) AND I < N - 1 THEN I = I +
      1: GOTO 21230
21250 I = I + 1
21260  PRINT NO(I)","NL(I)
21270 I = I + 1
21280  PRINT
21290  IF I < N - 1 THEN NU = NU +
      10: GOTO 21220
21310  PRINT "SAVE PROGRAM "MUSIC
      $
21320  PRINT "DELETE MUSIC MAKER"
21330  PRINT D$;"CLOSE MUSIC MAKE
      R"
21340  PRINT D$;"EXEC MUSIC MAKER
      "
21350  END
21970  REM  ***** SIGNING OFF ***
      **
22000  HOME
22010  VTAB 10: HTAB 14: PRINT "T
      HANKYOU ";
22020  FOR I = 1 TO 8
22030  POKE 6, INT ( RND (1) * 42
       + 14): POKE 7, INT ( RND (1
      ) * 100 + 100): CALL 768
22040  NEXT
22050  VTAB 12: HTAB 14: PRINT "B
      YE BYE"
22060  END
```

BIG APPLES !

Intelligence Research now has the following enhancements available for the Apple II.

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A mod to make Videx take more kindly to Pascal

By
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USERS of the Apple II with Pascal and with a Videx Videoterm 80 column card installed will realise that there are certain drawbacks to its use. The most obvious is that it is not possible to display the high resolution graphics screen, nor is it easily possible to return to the normal 40 column display.

In Basic it is possible to switch the card between the normal display and the Videx 80 column output. This is not possible in Pascal because when the system boots it scans the slots, registers the existence of the Videx card as an external terminal, and routes all output to that slot. It is not possible to direct the system to ignore the presence of the external terminal and route output to the normal Apple display.

One partial solution, recommended by Videx, is to use a direct memory addressing routine (a POKE) which alters the location in the BIOS in which the information about the contents of slot 3 are stored. This location is -16389 for Pascal II.0, and -16598 for Pascal 1.1. Toggling between a value of 4 (external terminal present) and 0 (slot empty) should fool the system into accepting or ignoring the card under software control.

This is, however, only a partial solution. It can be used within a program, but the location must be toggled back to 4 before program termination, and certain instructions (including PAGE(OUTPUT)) result in unpredictable behaviour. In short, the solution is not satisfactory.

Until a better software solution can be found, we have found a hardware modification to be useful. This does not allow switching between formats during program execution, but it does allow the system to be booted either "with" or "without" the card, without physically removing the Videx card from the Apple.

If, as we regularly do, you need to run software under Pascal that either operates with an 80 column format or else with a clearer 40 column screen and graphics, you may find this simple modification worth installing. If carefully effected it can be removed from the card at any time to restore it to its original state.

It is designed to be used in conjunction with the Videx switchplate, but can be used with any suitable switch attached to the rear of the case. The result of the modification is that with the switch down, when booted the system operates in 80 column mode. When booted with the switch up, then the machine operates as if no Videx card were present. Changing between modes, it is necessary to reboot the system.

Any Apple peripheral card can be disabled by setting the I/O SELECT (pin 1) to high (+5V). On the Videx card, pin 1 is only connected to U1 pin 4 and U6 pin 2. It is therefore easy to unplug these pins and thus allow the I/O SELECT line to be switched between normal and disabled. The modification can be installed as follows:

1. Install a new 10-way connector as an extension of the existing 6-way connector at the top left of the board. Use a 10-way wire-wrap post 0.1" socket (PCB mounting type) and bend pins 1,2,3,4 and 6 from 90 degrees to horizontal and solder this socket onto the similar 6-way connector on the Videx card, matching pin number for pin number.

2. Locate U1 (74LS86). Remove from socket and bend pin 4 so that it projects horizontally out from the package. Replace the IC.

3. Locate U6 (74LS00). Repeat the procedure of step 2 for pin 2 of this IC.

4. Using thin insulated wire (wire-wrap type is ideal), link the two pins just exposed, and then link them to pin 9 of the new connector.

5. Now connect pin 8 of the new socket to pin 1 of the peripheral connector, which is available in a feed-through plated hole next to U3 pin 10.

6. Connect pin 10 of the new con-

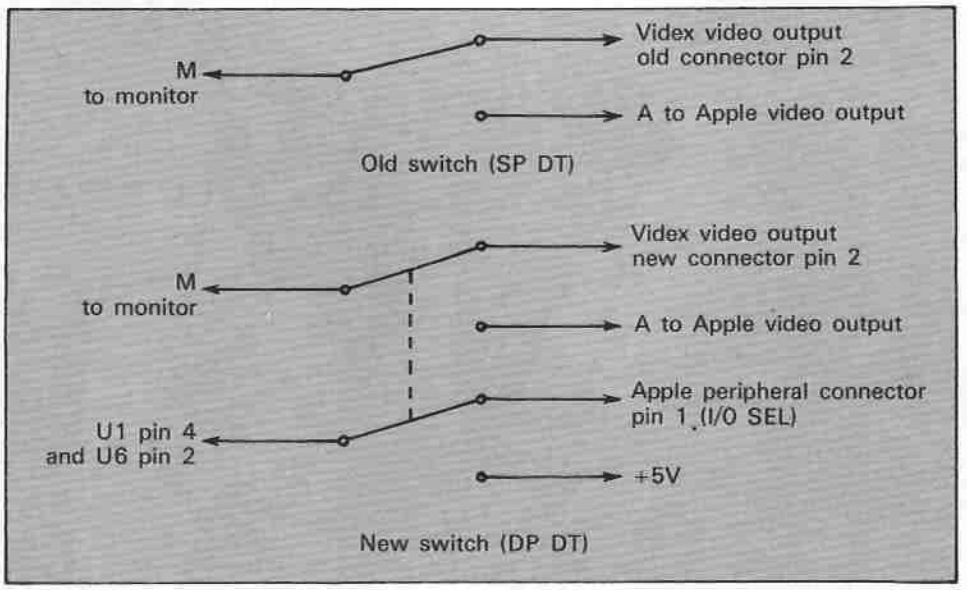

Fig 1.

HELPING HANDS

MANY small programs are now available designed to make life easier for the programmer, serious user, enthusiast or frustrated amateur. They cost little, but if they meet a particular need are invaluable as computing aids. All come under the heading of utilities. Some are described here.

Little things that mean a lot..

Soft-Step: This interactive debugger for Applesoft Basic programs allows the user to single step through programs, examining or defining variables or memory. Other features include breakpoint setting, predefined automatic printing of memory or variables at debugger pauses, tracing some or all lines (clearer than the Applesoft trace) and printing PEEK or POKE values into memory. *Price £24.95.*

Accu-Shapes: The ultimate shape builder program for interfacing with applications which encourages experimentation. Includes global edit commands to move, expand or contract the shape you are working with. Shapes can be constructed in low resolution for use as high resolution shapes, allowing greater and easier manipulation of detail.

The package includes options for paging through the shape table as though through a book, plus the ability to change the order, insert new shapes, delete, save, load and even copy to screen in low res for further editing. *Price £24.95.*

The Bug: This is an easy-to-use diagnostic aid for getting bugs out of assembly programs. The Bug lets the user try out programs at workable speeds and displays the effect the program has on the Apple as it executes. Breakpoints can be set and lower level sub-routines can be run automatically at full speed. This comprehensive tool comes with a full manual, and can be used by the serious programmer or as an introduction to effective use of assembly language programming by the novice. *Price £40.*

OmniDOS: Access either 13 or 16 sector discs automatically, using either or both formats simultaneously. The user does not even have to know which format the disc is in to be able to use it. The disc also contains a number of other useful functions, including the ability to change DOS commands and error messages, either in memory or on slave discs, to provide program protection.

DOS can also be relocated and data discs can be prepared with all tracks available to the user. Discs can also be part INITed to restore DOS to discs which have been corrupted by starting to INIT them. Directories can be moved to make copying difficult. *Price £22.*

Tree Sort: A high speed sort using data in Applesoft arrays. Sorts data (1000 items in five seconds, 1000 words in eight seconds) in ascending or descending order, whole or part arrays, stored in another array, or on single and multiple dimension arrays. The software comes with extensive documentation and demonstration programs. *Price £22.*

XMON: An extended monitor, offering new commands such as single stepping, trace, improved move command, relocation of machine language programs, comprehensive finds, hex dumps, hex-to-dec conversions and vice versa, 16 bit add and subtract, 16 bit multiply with 32 bit result. The system includes powerful new editing features and directional keypad cursor movements. A stop-list routine is also included. *Price £22.*

Business Basic: A modified version of Basic requiring a RAMcard which provides additional functions to improve commercial software development. These include formatting commands, allowing tabbing up to 32 fields, screen or page modes to show screens or scrolling, bi-directional scrolling, store-and-recall of arrays, string array exchange commands as well as improved string handling, a help feature, a mini-assembler, improved program listing, and compatibility with CCS arithmetic processor. *Price £28.*

VisiCalc Utilities: This set of software enables users to study VisiCalc formulae in printed worksheets without being confined to the Apple screen, and to format printouts of the models more efficiently, using variable column widths, additional text headings, dates, page control and numberings. Dates and time from clock cards can be incorporated into the printout, and the VisiPrint format files can be saved to disc for future use. *Price £34.95.*

Tridee: An addition to the Pascal library permitting the creation of 3D graphics viewable from any angle and distance. It's as easy to use as Turtlegraphics, and features include ortho, perspec, rotate, view, move-to 3, and view from. *Price £49.95.*

Symdis: A symbolic disassembler for the 6502 microprocessor, to be used by experienced programmers or less experienced amateurs. Symdis takes a block of machine code from anywhere in ROM or RAM (except zero page) and produces a disassembled source code showing all relative branches and internal absolute address references converted to alphanumeric labels. Operands will be replaced by address-related symbols, and target addresses will be labelled with correct symbols. *Price £23.95.*

DIY

nector to +5V, which is available at U18 pin 20.

The connections to upper left of the card will now be:

OLD	NEW Connector
1. Ground	1. Ground
2. Video	2. Video
3. -5V	3. -5V
4. +12V	4. +12V
5. Keyway	5. Keyway
6. Lightpen	6. Lightpen
	7. Keyway
	8. Bus connector pin 1 (I/O SEL)
	9. U1 pin 4 and U6 pin 2
	10. +5V (U18 pin 20)

7. Replace the single-pole double-throw switch on the switchplace with a similar double-pole double-throw switch. Connect as in Fig 1.

Your modification is now complete. Although it will void your warranty on the card, if carried out carefully you should experience no problems with this modification which is easily reversible. We can of course accept no responsibility for any problems which arise, but have met no difficulties ourselves in making and using this simple alteration. If anyone knows of a better or more flexible modification to make the Videx card more friendly under Pascal, then we should be pleased to hear of it.

Sensing and controlling the environment

Concluding R.A. SPARKES' article on the construction and use of a simple yet powerful user port for the Apple.

INCREASINGLY in industry the solution to problems in electronics is becoming one of adapting a general purpose circuit to specific uses rather than designing a special circuit each time. Traditional control technology has laid emphasis upon the second of these approaches – the hardware solution.

The Apple II can be used to demonstrate the more modern software approach. The first two programs demonstrate how the unit can be used to control the LEDs. Note that in each case the electronic circuit remains the same. It is only the program that is changed.

For program 1 it is assumed that three LEDs represent the red, amber and green traffic lights. The program shows how these lights can be controlled by POKING the numbers 128, 64 and 32 (and combinations of them) into the B-register. As an experiment try switching on the LEDs in a different sequence. In particular use six LEDs to simulate the two sets of traffic lights of a road junction.

Program 2 switches on the LEDs in an orderly way by adding 1 to the number POKEd into the B-register address each time. The LEDs thus count up in binary. Try making the LEDs count down in binary instead.

The states of the input lines to the input port are read from the address 49345. Program 3 shows how the state of each line can be "echoed" to the LEDs. This program is unnecessarily complicated, since the simple statement:
10 POKE 49344,PEEK(49345): GOTO 10
will do just as well. However, we wanted to demonstrate how Applesoft Basic determines which of the inputs is high and which is low. The switch inputs can thus represent different devices, such as photocells, trip-switches, water-level indicators, temperature switches and the like. The output LEDs can represent motors, lamp indicators, heaters, water valves and pumps.

It is thus possible to simulate an automatic washing machine with this program. Given the necessary buffers to obtain sufficient power, an automatic washing machine could even be built!

A simple burglar alarm suffers from all sorts of drawbacks. How does the owner get into the house, or even out of it, without triggering off the alarm? Program 4 is an alarm routine which starts from the simple burglar alarm and adds complexities one by one.

Its purpose is to demonstrate the point that once the basic electronic circuit has been constructed it is a simple matter to change its mode of operation, altering the program rather than the circuitry. This program also produces a 'sound' output through the Apple speaker and the LEDs are flashed alternately on and off as well.

The triggering of the alarm should be the burglar crossing in front of a photocell, but that can be simulated by a switch to demonstrate the program's operation.

Other applications

We have hardly begun to make use of this interface. It is a powerful counter and timer and can make measurements of time interval, period, frequency, speed and acceleration. It can also generate pulses of almost any desired frequency up to 1 mHz. Coupled to a digital to analogue convertor, it is able to produce waveforms of any desired shape to simulate musical instruments.

An analogue to digital convertor turns it into a universal laboratory instrument, capable of measuring voltage, current, power, resistance, temperature, sound level, light intensity, force, pressure, displacement, pH or almost another other physical quantity.

The creation of a storage beam oscilloscope, which can later output its data to a chart recorder, is perfectly feasible. Or you could rig your Apple to control the temperature and humidity of your greenhouse. It could even open the door automatically on your approach.

```
1  REM   PROGRAM  1 - TRAFFIC LIGHTS
10  HOME : VTAB 4
20  PRINT "      TRAFFIC LIGHTS"
30  PRINT : PRINT : PRINT "THIS PROGRAM RUNS A SET OF TRAFFIC"
40  PRINT : PRINT "LIGHTS IN SEQUENCE."
100  POKE 49346,255: REM   ALL BITS AS OUTPUTS
110  POKE 49344,128: REM RED LIGHT
120 T = 5: GOSUB 500: REM   LONG DELAY
130  POKE 49344,192: REM RED AND AMBER
140 T = 1: GOSUB 500: REM  SHORT DELAY
150  POKE 49344,32: REM GREEN
160 T = 5: GOSUB 500: REM  LONG DELAY
170  POKE 49344,64: REM AMBER
180 T = 1: GOSUB 500: REM  SHORT DELAY
200  GOTO 110
300  REM  **********************
400  REM  DELAY ROUTINE
500  FOR I = 1 TO T * 800: NEXT I
510  RETURN

1  REM  PROGRAM 2 - BINARY COUNTER
10  HOME : VTAB 4
15  PRINT "      BINARY COUNTER"
100  POKE 49346,255: REM  ALL BITS AS OUTPUTS
110  FOR X = 0 TO 256
120  POKE 49344,X
130  FOR T = 1 TO 200: NEXT T
140  NEXT X
150  GOTO 110
1  REM  PROGRAM 3 - SWITCH MONITOR
100  POKE 49346,255: REM  B PORT IS OUTPUT
110  POKE 49347,0: REM  A PORT IS  INPUT
120  HOME : VTAB 4
130  PRINT "      SWITCH MONITOR"
140  PRINT : PRINT "THE EIGHT SWITCHES CONNECTED TO THE "
150  PRINT : PRINT "A-PORT ARE MONITORED AND REFLECTED"
160  PRINT : PRINT "IN THE EIGHT LED INDICATORS CONNECTED"
170  PRINT : PRINT "TO THE B-PORT"
180 OUTPUT = 49344
190 SWITCHES = 49345
200 X =  PEEK (SWITCHES)
210 Y = 0
220  IF X > 127 THEN X = X - 128:Y = 128
230  IF X > 63 THEN X = X - 64:Y = Y + 64
240  IF X > 31 THEN X = X - 32:Y = Y + 32
250  IF X > 15 THEN X = X - 16:Y = Y + 16
260  IF X > 7 THEN X = X - 8:Y = Y + 8
270  IF X > 3 THEN X = X - 4:Y = Y + 4
280  IF X > 1 THEN X = X - 2:Y = Y + 2
290  IF X > 0 THEN Y = Y + 1
300  POKE OUTPUT,Y
310  GOTO 200
```

USER PORT

```
1  REM  PROGRAM 4 - BURGLAR ALARM
10  HOME
20  PRINT "     BURGLAR ALARM"
30  PRINT : PRINT "THIS PROGRAM ILLUSTRATES THE DIFFERENCE"
40  PRINT : PRINT "BETWEEN SOFTWARE ENGINEERING AND THE"
50  PRINT : PRINT "PREVIOUS METHODS OF ELECTRONICS:-"
60  PRINT : PRINT "HARD-WIRING."
70  PRINT : PRINT : PRINT : PRINT "A PHOTOCELL SHOULD BE CONNECTED TO"
80  PRINT : PRINT "INPUT 1, SOUND OUTPUT IS VIA THE "
90  PRINT : PRINT "INTERNAL SPEAKER."
100  PRINT : PRINT : PRINT "PRESS '0' TO CONTINUE."
105  GOSUB 20000
110  GET A$: IF A$ < > "0" THEN 110
120  HOME
130  PRINT : PRINT : PRINT "PRESS 'SPACE' TO ACTIVATE THE SYSTEM."
140  POKE 49346,255: POKE 49347,0: REM  PORT A IS INPUT, PORT B IS OUTPUT

150 X =  PEEK (49345)
155  GET A$: IF A$ < > " " THEN 155
160  PRINT : PRINT : PRINT "CROSS THE LIGHT BEAM TO SET OFF"
170  PRINT : PRINT "THE ALARM."
180  IF X =  PEEK (49345) THEN 180
190  FOR I = 1 TO 30
200  POKE 6,60: POKE 7,200
210  CALL 944
220  IF  PEEK (49344) = 0 THEN  POKE 49344,255: GOTO 250
230  POKE 49344,0
250  NEXT I
300  REM  LEAVING-TIME
310  HOME
330  PRINT "   THIS SIMPLE ARRANGEMENT DOES NOT LET"
340  PRINT : PRINT "THE OWNER OF THE HOUSE GET OUT, BECAUSE"
350  PRINT : PRINT "HE HAS TO CROSS THE BEAM TO LEAVE THE"
360  PRINT : PRINT "HOUSE."
370  PRINT : PRINT "BY ADDING A DELAY ROUTINE BETWEEN "
380  PRINT : PRINT "ACTIVATING THE SYSTEM AND CROSSING"
390  PRINT : PRINT "THE BEAM, THE SYSTEM CAN BE CHANGED"
400  PRINT : PRINT "TO ALLOW FOR THIS."
410  PRINT : PRINT "THERE ARE ABOUT 10 SECONDS BETWEEN "
420  PRINT : PRINT "PRESSING THE 'SPACE' BAR AND THE ALARM"
430  PRINT : PRINT "SYSTEM BECOMING ACTIVE, DURING WHICH"
440  PRINT : PRINT "TIME, THE PHOTOCELL IS NOT ACTIVE."
450 X =  PEEK (49345)
460  GET A$: IF A$ < > " " THEN 460
470  FOR T = 1 TO 8000: NEXT T
480  HOME : VTAB 10: PRINT "NOW CROSS THE LIGHT BEAM TO SET OFF"
490  PRINT : PRINT "THE ALARM."
500  IF X =  PEEK (49345) THEN 500
510  FOR I = 1 TO 30
520  POKE 6,60: POKE 7,200
530  CALL 944
532  IF  PEEK (49344) = 0 THEN  POKE 49344,255: GOTO 540
534  POKE 49344,0
540  NEXT I
550  HOME
560  VTAB 4
570  PRINT "THIS SHOWS HOW THE BEHAVIOUR OF THE"
580  PRINT : PRINT "ELECTRONIC CIRCUIT CAN BE CHANGED"
590  PRINT : PRINT "WITHOUT ALTERING ANY OF THE WIRING"
600  PRINT : PRINT "IN ANY WAY."
610  PRINT : PRINT : PRINT "THIS IS SOFTWARE ENGINEERING."
620  PRINT : PRINT : PRINT "PRESS 'C' TO CONTINUE."
630  GET A$: IF A$ < > "C" THEN 630
700  REM   ENTERING AND  LEAVING-TIME
710  HOME : VTAB 2
730  PRINT "THIS ARRANGEMENT DOES NOT LET THE"
740  PRINT : PRINT "OWNER OF THE HOUSE GET IN, BECAUSE"
750  PRINT : PRINT "HE HAS TO CROSS THE BEAM TO DO SO."
770  PRINT : PRINT "ADDING A DELAY ROUTINE ALLOWS FOR THIS."
800  PRINT : PRINT "THERE ARE ABOUT 10 SECONDS BETWEEN "
810  PRINT : PRINT "CROSSING THE BEAM THE ALARM GOING OFF,"
820  PRINT : PRINT "DURING WHICH TIME THE OWNER CAN SWITCH"
830  PRINT : PRINT "THE ALARM OFF BEFORE IT SOUNDS."
840  PRINT : PRINT "THE TEN-SECOND LEAVING-TIME APPLIES TOO."
845  PRINT "AFTER THE SPACE BAR IS PRESSED."
850 X =  PEEK (49345)
860  GET A$: IF A$ < > " " THEN 860
870  FOR T = 1 TO 8000: NEXT T
880  HOME : VTAB 10: PRINT "NOW CROSS THE LIGHT BEAM TO SET OFF"
890  PRINT : PRINT "THE ALARM, WHICH WILL EVENTUALLY SOUND"
895  PRINT : PRINT "UNLESS THE SPACE BAR IS PRESSED."
900  IF X =  PEEK (49345) THEN 900
903  POKE  - 16368,0: REM  CLEAR KEYBOARD STROBE
905  FOR I = 1 TO 1000
907  IF  PEEK ( - 16384) = 160 THEN 1000: REM   IS SPACE BAR PRESSED?
908  NEXT
910  FOR I = 1 TO 30
920  POKE 6,60: POKE 7,200
930  CALL 944
932  IF  PEEK (49344) = 0 THEN  POKE 49344,255: GOTO 940
934  POKE 49344,0
940  NEXT I
950  HOME
960  VTAB 4
970  PRINT "YES, THE ALARM SOUNDED SINCE IT WAS NOT"
980  PRINT : PRINT "DISABLED."
981  PRINT : PRINT : PRINT "THE BURGLAR GETS CAUGHT !!!"
982  FOR J = 1 TO 10
983  POKE 6,110: POKE 7,250: CALL 944
984  POKE 6,130: POKE 7,210: CALL 944
985  NEXT J
990  END
1000  PRINT : PRINT "AS YOU SEE, THE ALARM DID NOT SOUND."
1010  END
20000  REM  SOUND ROUTINE.
20001  REM  TONE IN LOCATION 6
20002  REM  DURATION IN  LOCATION 7
20003  REM  CALL 944 TO GET THE NOTE
20010  FOR I = 944 TO 975
20020  READ X
20030  POKE I,X
20040  NEXT I
21000  DATA   120,165,7,133,9,173,48,192
21010  DATA   165,6,133,8,198,8,208,252
21020  DATA   173,48,192
21030  DATA    165,6,133,8,198,8,208,252
21040  DATA   198,9,208,230,96
22000  RETURN
```

Appletip

This program will print the starting address and length in decimal of the last **BLOADED** file. First **BLOAD** the file and then run this program.

M. Osborne

```
1  REM  By M.OSBORNE 1982
2  HOME
3  PRINT "IS THE PROGRAM IN MEMOR
   Y?"
4  GET A$: IF A$ < > "Y" THEN  GOTO
   2000
20  PRINT "FILE START+LENGTH FIN
   DER BY M.OSBORNE"
30  PRINT "WHAT MEMORY SIZE SYSTE
   M ARE YOU USING?"
60  PRINT "A"," 16K SYSTEM"
70  PRINT "B"," 32K SYSTEM"
80  PRINT "C"," 48K SYSTEM"
90  INPUT A$
100  IF A$ = "A" THEN  GOSUB 500
110  IF A$ = "B" THEN  GOSUB 1000

120  IF A$ = "C" THEN  GOSUB 1500

140  PRINT "THESE FIGURES ARE IN
   DECIMAL"
141  PRINT "SO THE '$' SIGN SHOUL
   D BE LEFT OUT"
142  PRINT "WHEN SPECIFYING PARAM
   ETERS"
160 S =  PEEK (X) +  PEEK (X + 1)
    * 256
170 L =  PEEK (Y) +  PEEK (Y + 1)
    * 256
180  PRINT "THE STARTING ADDRESS
   IS ";S
190  PRINT "THE LENGTH IS
   ";L
200  END
500 X = 10866:Y = 10848: RETURN
1000 X = 27250:Y = 27232: RETURN

1500 X = 43634:Y = 43616: RETURN

2000  HOME : PRINT "BLOAD THE PRO
   GRAM AND RUN THIS PROGRAM"
2010  PRINT "AGAIN": END
```

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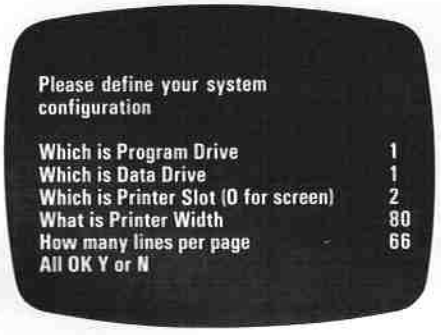
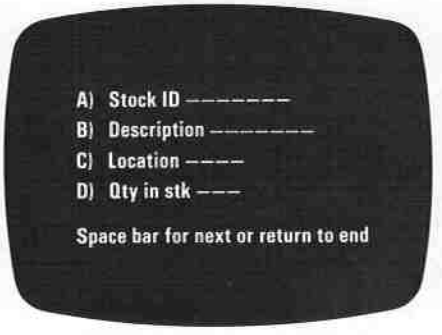
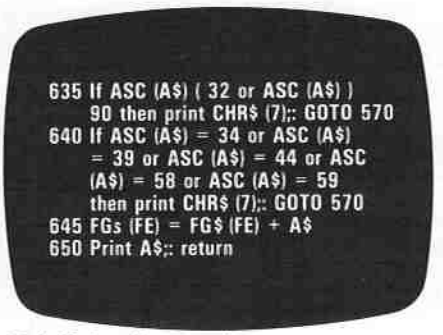


System Configuration



Record Layout Design



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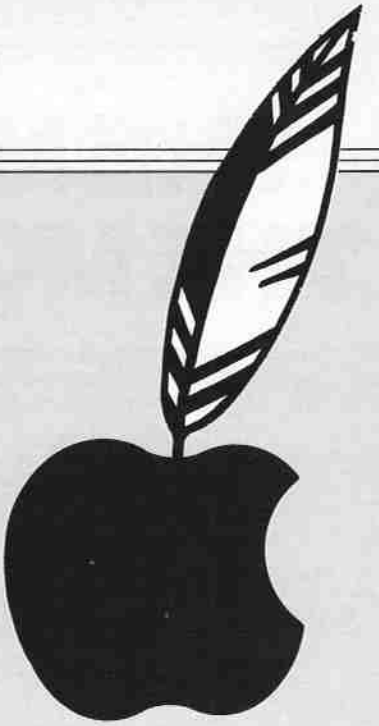


It is, regrettably, a long way from Grahamstown

ONE of the disadvantages of living in South Africa is its geographical position. How useful it must be for Apple owners to be able to attend a convention such as the one you had in June. I envy them! We have approximately 30 Apple II Plus machines on the campus and I am sure that all our users would have benefited by attending Apple 82.

We rely on the printed word to keep us up to date, and surely second best after a visit to Apple 82 must be a subscription to Windfall. Keep up the good work. **Prof. J.M. Haigh. School of Pharmaceutical Sciences, Rhodes University, Grahamstown.**

Awkward buffer

HAVING copied up Mike Glover's Screendump program (and converted it so that it allowed you to dump the Lo-res screen to a Microline-80), I found that when the routine returned, the contents of the input buffer were unpredictable, unusable, and sometimes rather awkward.

Obviously it is possible to flush the buffer with a CTRL-X, but a rather more elegant way of dealing with the problem is to exit from the machine code routine via a jump to GETLNZ ($FD67), which leaves you in normal "start of input" mode, – **L.P. Lewis.**

Cheltenham invitation

I WOULD like to thank you for publicising our Cotswold Apple User Group, and take this opportunity to tell you more about us. We include in our number some programmers, an ear surgeon, a quantity surveyor, an educational psychologist, and a spread of members from commerce, education and agriculture.

We have already brought together various skills to produce specialist software which it is hoped to market this year. In the future we have offered our services in the timing of the local 'Half Marathon' which is run in aid of a hospital charity.

Our meetings are held regularly on the last Thursday of the month at a venue in Cheltenham. The meetings are informal and generate plenty of discussion. There is a growing number of dedicated VisiCalc users who swap ideas and techniques. It is surprising how powerful this package can be.

I hope that you will be able to publish some of this letter, and I invite anyone in the area, who has not been to a user group before, to contact me for details of the next meeting. I am certain that he will leave us richer in knowledge than before. **– J.G. King, 11 Sheepscombe Close, Benhall, Cheltenham.**

Cut down on retyping

IT often happens that Apple II program lines containing PRINT statements need modifying. If the lines are short, then the easiest way is just to retype them, but in long, multi-statement lines this is rather tedious and it is far easier to make the changes using the 'ESC IJKM' and right arrow facilities.

Several writers have suggested using 'POKE 33,33' to get over the problem of accidentally embedded spaces, but this makes the program very hard to read by compressing the left margin so that the line numbers disappear among the rest of the program. The following line works fine, lists properly and can be re-entered using the right arrow key:

```
360..VTAB.8:.PRINT."DATE...DETAI";
"LS..CREDIT...DEBIT..BALANCE"
```

I have put the full stops in to count the spaces but in essence, all you do is break off the word being entered two spaces from the end of the listed line, type ' ";" ' and carry on. The above example was in fact part of a long line which underwent numerous changes during its development.

Regrettably, the same thing cannot be done with INPUT statements – the program expects to get its input after the first part of the statement. Nevertheless, this trick may be of interest to your readers. – **J.N. Price, Lagos.**

Alternative to Cesil

I READ with great interest Dr North's article on the implementing of ICL Cesil on the Apple (Windfall Vol. 2 No. 1). I would, however, like to draw his attention to an alternative package to the two mentioned – it's called Cesil 11. As with the other two packages, the system is written in Applesoft Basic. It was written with the full approval of ICL and with their full support. It does differ from the mainframe compiler in two main aspects:

1. In nearly all areas of operation the specifications for Cesil II are enhanced over the original.

2. The system is written for real time use and embodies a pseudo compiler which allows the user to input his program, list it, run it and correct it all in one session.

The package was rigorously tested during its development by a local preparatory school (who subsequently purchased the first package). One of its main features is exhaustive error trapping and syntax checking at source, saving much time and frustration for the user.

If any of your readers is interested in obtaining a specification of the system along with sample outputs then they may contact either Mr Phil Williams of Cardiff Micro Computers or myself at David Potter Office Equipment (full addresses available from Apple's authorised dealer list).

I feel I must declare my vested interest in the software, as I wrote it. Finally, if anyone of the many users of Cesil II across the country would like to contact me with regard to possible enhancements I would be happy to hear from them. – **Andrew Esseen, Penarth, S. Glam.**

Calling ALF users

I AM a regular subscriber to Windfall and use two Apples, one at work and one for my own amusement. My main hobby interest is music, as I have the Mountain Hardware Music System, which I am not very keen on, and the ALF 16 which is excellent but not versatile enough.

I have a great deal of music which I have entered with the ALF and would like to be put in touch with other ALF users. – **G. Buckle, 4 Silkstone Lane, Cawthorne, Barnsley.**

Aplus to end the battle?

THE debate between Pascal protagonists and Basic buffs rages on and on. In each issue we see Pascalers extolling the virtues of structured programming with their named procedures and IF-THEN-ELSE commands. Each time the Basic programmers reply is "Great, but at what cost in complexity?"

I recently discovered a remarkable part way house in the form of Aplus, a small machine language routine which allows WHEN-ELSE; multiline IF; WHILE; unless; UNTIL and CASE commands. Joy of joys, it also allows subroutines to be called by name.

I have found that when programming with these commands my programs become more clear and nearly self documenting and that my "bug level" has dropped as a result.

I enclose a short example program which demonstrates some Aplus commands and also its equivalent in Applesoft.

Could this be the cause of an (unheard of) truce in the war of the languages? – **Ian Tranter, Camberley, Surrey.**

(Applesoft)

```
1   GOSUB 10
2   END
10   REM
20   REM
30   GOSUB 220
40   GOSUB 240
50   IF   NOT THEREISANANSWER GOTO
      20
60   IF   NOT (ANSWER$ = "GOOD") GOTO
      90
70   GOSUB 260
80   GOTO 110
```

(The controlling program)

```
90   REM
100   GOSUB 280
110   REM
130   RETURN
220   REM
225   REM  DETAILED BASIC CODE
230   RETURN
240   REM
245   REM  DETAILED BASIC CODE
250   RETURN
260   REM
265   REM  DETAILED BASIC CODE
270   RETURN
280   REM
285   REM  DETAILED BASIC CODE
290   RETURN
1     "DO  SHOW SOME APLUS COMMANDS"
2     END
```

(Named subroutine)

```
10    "TO  SHOW SOME APLUS COMMANDS"
```

(UNTIL command)

```
20    : UNTIL (THEREISANANSWER)
30    : : "DO  PRINT THE QUESTION"
40    : : "DO  GET THE ANSWER"
50    : ::FIN
```

(WHEN-ELSE command)

```
60    : WHEN (ANSWER$= "GOOD")
70    : : "DO  ALL KINDS OF THINGS"
80    : ::FIN
90    : ELSE
100   : : "DO  SOME OTHER THINGS"
110   : ::FIN
130   ::FIN
```

(Lower level named subroutines)

```
220   "TO  PRINT THE QUESTION"
225   : REM  DETAILED BASIC CODE
230   ::FIN
-------------------------------
240   "TO  GET THE ANSWER"
245   : REM  DETAILED BASIC CODE
250   ::FIN
-------------------------------
260   "TO  ALL KINDS OF THINGS"
265   : REM  DETAILED BASIC CODE
270   ::FIN
-------------------------------
280   "TO  SOME OTHER THINGS"
285   : REM  DETAILED BASIC CODE
290   ::FIN
460   REM
470   REM
480   REM ------------------------
490   REM
500   REM  All the indenting and
505   REM  layout was done
510   REM  automatically by Aplus
520   REM
530   REM ------------------------
```

● Aplus is a 4k machine language utility that adds structured commands to Basic. It also automatically indents and lists programs to clarify the logic flow. It can be bought from SBD Software for £18.

Problems with paper

I NEED a source of self-adhesive labels suitable for envelopes, mounted on a continuous backing web having a width between the sprocket holes of nine inches. The printer used is a Centronic 739 and has a fixed width tractor feed.

I have tried all the paper manufacturers I know of, Centronics UK, Data Efficiency (the agents) and Apple UK, (who feature it in their current advertising). Perhaps your readers could help. – **Malcolm Kilvington, Department of Nephrology, Hull Royal Infirmary.**

Computer collection

The other night a computer evening was held at our school, when parents were invited to come along and learn something about new technology. We were expecting only a dozen or two, but over 100 came in.

Parents were asked to make a donation towards more computers, and the total sum of money was – £4,000.

A Windfall magazine was placed by each computer and every 10 minutes another had to be replaced, due to the fact they were free to take.

Windfall is the best magazine my money or anyone else's money can buy. Keep up the brilliant work. – **Narinder Dhesi (aged 16), Banbury, Oxford.**

Good for a rebate

I WISH to put the record straight on your article "Always good for a rebate" in the What's News section of Windfall – July edition.

The dedicated interface device mentioned in the article was not developed by Westwood Computers but was in fact supplied by MDA Computer Systems as part of our CO1 emulation package.

In addition, credit for the success of the project must go to Paul Clive who wrote the basic programs. – **Roger Sinden, MDA Computer Systems.**

Not so inscrutable, thanks to the Apple

By ERIC and SPENCER WONG

MAH Jong, while a reasonably well known game in this country, is extremely popular in Asia, especially in Hong Kong and Japan. In contrast to its ancient modes of play, using ivory pieces and tallies, the current rage there is for playing it on computers. We have the Apple version and would like to show that, despite its apparent complexities when seen on the screen, it is an easy game to play.

Mah Jong is written in machine code to provide a fast response, although the speed produced may be a little quick for beginners. The rules are straightforward, and play is simple if you stick to them. The main complication with Mah Jong is in the final counting of money and assessment of the worth of your cards, but this is now all done by the Apple.

Originally the game was intended for four players, but this version pits one person against the computer. It is completely up to date with the latest Japanese version of Mah Jong, requiring as much skill, cunning and strategy as you can muster to beat the Apple, as you would to beat the Japanese. You have to be completely on the ball, but you can let the computer do all the hard manual and mental work like setting up the game and counting the scores.

On booting the disc and pressing 'N' to start you are faced with four rows of 'cards', three of which are controlled by the Apple, and the fourth by the player. Japanese characters down the left hand side of the screen indicate the player's 'wind'. For non-Mah Jong players the North, South, East and West winds have special significance in the game, which has connections with Asian mythology.

The score and options available are displayed across the top of the screen. A slight problem, however, is that they are written in Japanese. The aim of the game, as with many European card games, is to get combinations of cards or tiles, such as two, three and four of a kind, a run of values and so on. As in playing cards there are four cards in each suit, but with only three suits – circles, bamboos and characters. There are also various other "cards" which, when played, increase the values of the final score.

Each hand is dealt 13 cards, with the starting hand having 14, and cards are dealt and retained or discarded in turn. To discard one of your own cards the key underneath the piece is pressed, followed by the space bar.

Sets can be built up blind to the computer if they are dealt directly to the player. If, however, you wish to pick up pieces discarded by other players, you can do this in a number of ways. If you have a pair, and another player discards the third piece in that set, you can press the letter 'P', and PONG (not a sound, but the name of the action) the three cards are placed on the bottom row of your section.

A CHOW, achieved by pressing 'T', enables you to pick up a card either side of a run of two. And a KONG (K) enables you to pick up the fourth piece if you have three of a kind.

If you have a mixture of CHOWs and PONGs enabling you to go Mah Jong, you press the 'R' key.

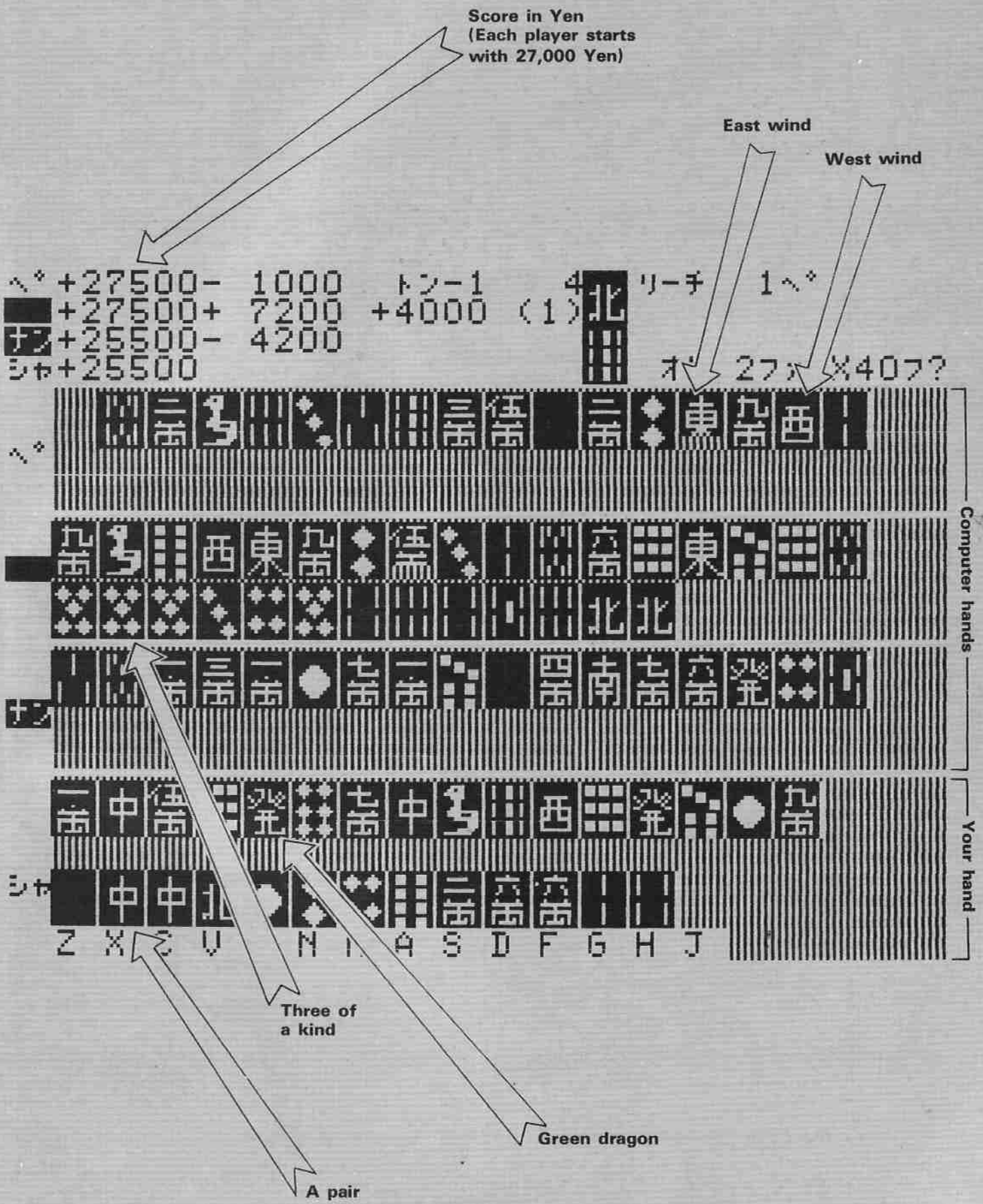
When one of the players goes 'Mah Jong,' a fanfare is sounded, all of the other players cards are displayed and the scores are calculated.

Mah Jong has a very attractive graphics layout and a quick response although, as mentioned before, it may be a bit quick for beginners. It is easy to boot and play and the background colour to the game, when played with a colour system, make the graphics stand out clearly.

One of the disadvantages is obviously the presentation of the instructions and commands in Japanese. We have given a brief breakdown of the instructions to Windfall, but we would like anyone who is willing to translate the Japanese instructions into English, or who would like to know how to get a copy of the program to contact us at Wycliffe College, Stonehouse, Gloucestershire.

ERIC and Spencer Wong came to Wycliffe College in Gloucestershire from Hong Kong three years ago. They had their first introduction to the Apple in the computer society at school, and later bought their own Apple while on holiday in Hong Kong. They have a habit of collecting interesting and rare programs – Mah Jong is just one of several – and want to share some of their experiences with Windfall readers. They would like to thank A.R. Jones and R. Warner for useful contributions to their article.

Wycliffe College computing society was formed four years ago with an Apple II and a single disc drive and colour card linked to a colour TV. At first computing was only available to sixth formers and the maths department, but slowly it spread throughout the lower departments of the school. By 1980 computing at Wycliffe was well established, and a year later membership had doubled. A second Apple has now been purchased and 'O' level computer studies courses are planned. Basic, Pascal and machine code languages are taught, although the preference is for Pascal, and Versawriter is used to aid the Apples' graphics capabilities.


Score in Yen
(Each player starts
with 27,000 Yen)
East wind
West wind
Computer hands
Your hand
Three of
a kind
Green dragon
A pair

First, take two numbers...

By R.A. MOULD

MANY very clever people have spent many, many hours constructing highly efficient sorting routines for use on mainframe computers. Unfortunately, since the methods invented are generally specific to a particular range of computers, they're not a lot of use to us. Furthermore, their relative efficiencies depend to some extent on whether data to be sorted is totally random or already partly sorted.

You may not think efficiency matters, since we're in no hurry, but the difference in the time taken to sort 100 numbers is a factor of more than 10 between the simplest (basic bubblesort) and a pretty slick method called shellsort – and the gap gets much larger as the number of items to be sorted increases.

So how do we go about writing a sort routine? All sorts work by comparing two numbers and swapping them if necessary. The clever bit lies in choosing which two numbers to compare.

The simplest sort involves comparing adjacent numbers and swapping them if necessary until every number has been compared with every other number. To demonstrate this, let's sort the numbers 8, 7, 6, 5, 4, 3, 2 and 1 into ascending sequence.

Step 1

Compare the first two numbers and swap them if the second is less than the first, to give:

7 **8** 6 5 4 3 2 1

Step 2

Now compare the second and third numbers and swap them, giving:

7 6 **8** 5 4 3 2 1

Step 3

Compare the third and fourth, and swap:

7 6 5 **8** 4 3 2 1

Steps 4 to 7

Continue comparing adjacent numbers and swapping if necessary, eventually giving:

7 6 5 4 3 2 1 **8**

You can see that the 8 has "bubbled" through the other numbers.

Now repeat steps 1 to 7 a second time. The 7 will bubble through. Repeating steps 1 to 7 a further five times will result in all eight numbers being in ascending sequence. This method involves 49 comparisons and 28 swaps in this case. A program to perform this sort is as follows.

```
100  REM  BUBBLESORT(1)
110  FOR K = 1 TO N - 1
120  FOR J = 1 TO N - 1
130  IF I(J) <  = I(J + 1) THEN 1
     80
140  REM  SWAP NUMBERS
150 W = I(J)
160 I(J) = I(J + 1)
170 I(J + 1) = W
180  NEXT J
190  NEXT K
```

This can be improved by omitting the comparisons with the numbers which have already bubbled through, so that only six comparisons are made in the second step, five in the third, and so on. This reduces the number of comparisons to 28. To do this, merely change lines 100 and 120 to

```
100  REM  BUBBLESORT(2)
120  FOR J = 1 TO N - K
```

The above methods take no advantage of the fact that the data may perhaps be partly sorted already. In this case it is possible that the data will be in the desired sequence before the sorting program is complete. To take advantage of this, count the number of swaps for each trip through steps 1 to 7. If no swaps are made, then the numbers are completely sorted. The program for this modified method involves making the following changes to either of the preceding programs:

```
100  REM  BUBBLESORT(3)
110 SWAPS = 0
120  FOR J = 1 TO N - 1
175 SWAPS = SWAPS + 1
190  IF SWAPS > 0 THEN 110
```

This method is only worthwhile if the data is largely already in the required sequence, otherwise it's rather poor.

Sorting is not restricted to numbers of course – it works just as well on strings. Suppose we wish to sort eight names, addresses and phone numbers into alphabetic order of names. Swapping all three data fields is rather slow. It's much better to swap only the item number (i.e. the "address" of the item), and use the names as the sort key. Assuming the names, addresses, phone numbers and item numbers are in the arrays N$(),A$(),P$() and I(), and that N=8 in this case, then the following program will sort the item numbers, using the names as the keys.

```
100  REM  ADDRESS SORTING. (BUBBL
     E(3))
110 SWAPS = 0
120  FOR J = 1 TO N - 1
130  IF N$(I(J)) <  = N$(I(J + 1)
     ) THEN 180
140  REM  SWAP ADDRESSES
150 W = I(J)
160 I(J) = I(J + 1)
170 I(J + 1) = W
175 SWAPS = SWAPS + 1
180  NEXT J
190  IF SWAPS > 0 THEN 110
200  REM  END OF SORT
500  REM  PRINT SORTED ARRAYS
510  FOR J = 1 TO N
520  PRINT N$(I(J)),A$(I(J)),P$(I
     (J))
530  NEXT J
```

None of these variations on bubblesort is particularly quick, unless the data is

Data	Bubble(1)	Bubble(2)	Bubble(3)	Shell
Test 1 Comparisons	9801	4950	9900	614
Swaps	4950	4950	4950	192
Time (secs.)	220	150	238	14
Test 2 Comparisons	9801	4950	9900	641
Swaps	3725	3725	3725	219
Time (secs.)	200	132	198	15
Test 3 Comparisons	9801	4950	198	481
Swaps	1	1	1	1
Time (secs.)	135	68	3	10

almost in the desired sequence already. In fact, the sort time rises very sharply with the number of items to be sorted. A very much better method is that known as shellsort (after its inventor D.A. Shell). The first version copes with only one sort key, but a few changes will allow it to sort on any number of keys.

The key field is KEY$() and the item number (i.e. the address) is in ADDR(). N is the number of items.

```
100  REM  SHELLSORT - SINGLE KEY
110 I = 1
120 I = 2 * I
130  IF I <  = N THEN 120
140 Q = I - 1
150 Q = (Q - 1) / 2
160  IF Q = 0 THEN 270
170  FOR J = 1 TO N - Q
180  FOR I = J TO 1 STEP  - Q
190 L = I + Q
200  IF KEY$(ADDR(L)) >  = KEY$(A
    DDR(I)) THEN 250
210 W = ADDR(I)
220 ADDR(I) = ADDR(L)
230 ADDR(L) = W
240  NEXT I
250  NEXT J
260  GOTO 150
270  REM  END OF SORT
```

To print the sorted list, use

```
500  FOR J = 1 TO N
510  PRINT N$(ADDR(J)),A$(ADDR(J)
    ),P$(ADDR(J))
520  NEXT J
```

Multiple key sorts can be accommodated as follows:

Place the sort keys in a two dimensional array of N records and M keys, and make the following program changes:

```
 70 NKEYS = 2     (NO. OF SORT KEYS)
 80 KEY(1) = 3    (SENIOR KEY - IN
                  COLUMN 3 OF ARRAY)
 90 KEY(2) = 1    (JUNIOR KEY IN
                  COLUMN 1 OF ARRAY)
192 FOR S=1 TO NKEYS
194 K=KEY(S)
200 IF KEY$(ADDR(L),K) > KEY$(ADDR
    (I),K) THEN 250
202 IF KEY$(ADDR(L),K) < KEY$(ADDR
    (I),K) THEN 210
204 NEXT S
206 GOTO 250
```

All the sorts can be changed from ascending to descending by reversing the comparisons. However, the multiple key shell sort cannot accommodate a mixed ascending/descending sort.

To demonstrate just how slow the bubblesorts really are, I've run some tests on the four methods described above. The first test was to sort into ascending sequence the numbers 100, 99, 98, . . . 1. The second was to sort into ascending sequence an array of numbers consisting of 50 numbers already in ascending order followed by 50 numbers in descending order. The third test assumed that all 100 numbers were already in ascending order except for two of them which were reversed. The number of comparisons made and swaps performed were counted and the whole sorting process timed.

'Computers changed the format of our company'

SMALL country-based chartered accountants rarely immediately begin to experiment with computer business systems, particularly when they are still a relatively new concern. Obviously such an exercise ties up essential capital and valuable client liaison time.

However, Jones and Partners, a Dorking, Surrey-based partnership, broke with tradition and installed their first system – a Nixdorf – when their business was in the throes of management change.

Since that time until the present day – approximately 10 years – the firm has grown with the data processing industry through to the microcomputer age, and is still experimenting to achieve the best business results to pass onto clients.

Their latest achievement is the installation of four Apple II microcomputers running VisiCalc software, recommended to them by Microcomputers for Business as being versatile enough to meet their needs.

According to senior partner Geoffrey Stone, the combination of the Apple II and VisiCalc satisfies basic needs as well as offering a whole lot more for both client and company.

On the company's side the system takes the drudgery out of routine administration thereby releasing senior personnel for the all important task of client liaison, and "getting the important work finished quickly and efficiently".

"Computerisation as a whole has definitely changed the personnel format in the company. For example we were either using qualified staff or hiring unqualified staff just to process routine work. Now the computers do the drudgery while our executives handle the clients", said Mr Stone.

From the client's point of view the bubble of mystique and imagined technical complications of accounting systems, VAT and taxation has been burst by the system.

For example, an accountant at the company can sit down with a client in front of the Apple and explain "on screen" his tax situation. It is possible to compute for a client such details as tax liability, how certain rates apply and what deductions are possible and those that are made and why. At the end of the consultation a client has had literally a full picture of his economic state. Obviously printouts are available.

"On the subject of printouts it is easy for us to send a client's tax details and tax returns in this form to the tax inspector", added Mr Stone.

In addition the system can revise cash flows, run budgets and handle consolidations once the parameters are set up. "It is a simple matter with the system to combine consolidation work sheets and purchase ledger accounts and to make adjustments", he said.

"Compared to the Nixdorf 88/20s using VRC cards, which were the first two systems installed by the company seven years ago, and which the partnership still use for management accounts, the Apple/VisiCalc system is way ahead in terms of operating flexibility", according to Mr Stone.

As a comparison between the flexibility of the Nixdorf and Apple II systems he cited a typical client – a car dealer – who wanted them to manage his accounts.

"Because of the peculiar nature of this kind of work we would need a flexible system such as VisiCalc plus the versatile operating system offered by the Apple II. Unlike the VisiCalc system other software used previously would have to be customised by an external software house", he said.

The Apple has solved both these problems at a stroke, as all the staff have taken to its use quickly and efficiently and the complete system has been interfaced to an Olympia ES 100 allowing a normal typewriter facility, too.

All the systems are also interfaced to four Microline 80 printers to take the slog out of such tasks as typing repetitive nominal payroll data.

Yet another added attraction of the 5in and 8in dual floppy disc based systems are that they naturally accept standard accountancy packages without software modifications.

ELEMENTS of the APPLE Part 5

The unfamiliar aspects

CHRIS CLARKE concludes his series of articles intended to provide a foundation for a full understanding of microcomputers.

THE Apple II has many outstanding features for the user to add, attach and plug things on to, and is of such a design as to have a large number of applications. It is of little wonder that what was designed for the home user or hobbyist has found much favour in the spheres of education, science, medicine and business.

In preceding articles, all the major elements of the Apple as a general purpose microcomputer have been examined and illustrated, and all that is now needed is a round-up of its unusual and unfamiliar aspects.

Firstly, another look at the video area. The video output into a monitor-type visual display unit – "composite video" – has to contain the information to be displayed, as stored in the RAM area, encoded with pulses that give the right frequencies for composite video. To do this the RAM area must be accessed for data and the synchronous video pulses generated.

As the generation of video signals is a very complex operation, suffice it to say that the signals generated contain the right components to give a picture on a video monitor, onto which is put the digital data for display.

The data for display is simply (though it is hardly a simple process) "clocked", or switched at regular intervals, from the RAM area into the video area. There it is fed into a character generator ROM, an interesting beast which we will look at soon, or through some shift registers into the encoder part of the video area for graphics display.

The data from the C.G. ROM then passes through an eight-bit shift register to produce serial data, and on into the encoder. This latter is a multiplexer which takes all the data signals and is clocked at the right frequencies by the video signals. The output is then mixed with other video signals to produce composite video. Considering the above, this may be thought of roughly as the display data "riding" on top of the video carrier frequencies.

Display data from the RAM however enters the video area in eight-bit form and must be converted into data compatible for producing a video signal. The character display format used on the Apple is a seven-by-five dot matrix, and to achieve this a 2k C.G. ROM is employed. This, like any 2k ROM, has eleven lines for addressing and eight data lines out.

The address lines consist of the eight bit data lines and three synchronous pulse lines to clock the data out correctly. Only five of the eight output lines are used – the horizontal width of the matrix. Once an eight bit byte from the data bus is inputted one specific location in the ROM is accessed and seven lots of five bits clocked out. (It happens in a different sequence of course, as up to 40 characters – the full width of text on the display – have to be outputted according to the horizontal scan.)

The Apple has a character set of 59 which, with 35 dots per character, gives 2k with 17 dots to spare. Ever wondered why the Apple has no in-built lower case characters? Some short cuts have to be made!

As for on-board I/O, there are a bunch of interesting gadgets there. The sound source of the Apple is a small loudspeaker driven by a transistor amplifier from a rapidly switched TTL latch. Though a "beep" is given on power-up and usual software operations, this is produced by the latter being switched at a rate suitable to give a modulated audio tone. Other sound effects may be produced by modifying the rate at which the latch is accessed – squeaks, bangs, whizzes and burrs included.

The cassette input is separate from the cassette output, both being through phono-type sockets at the rear of the motherboard. Input is via an operational amplifier into one line of a data selector, or multiplexer, which then puts one line out onto the data bus. Output is by means of a TTL latch fed from the address bus, outputting straight into the phono socket. This may seem unusual but the latch for the cassette output and that for the loudspeaker are the two gates contained in one 74LS74 package.

Similar to the loudspeaker, the cassette output latch need only be switched rapidly to give the frequency shift modulated signal by which digital data is stored on magnetic tape and hence the feed only from the address bus. With microcomputers this is most often an audio cassette which allows programs and data to be stored on the very machine that also blasts out the Rolling Stones or Blondie, depending on one's taste.

The most interesting of the on-board I/O is the game paddle connector. This has four analogue "read" inputs, two of which are used by the paddles, three TTL level-sensing inputs, two again used by the paddle switches, and four TTL level switchable outputs, plus connections to 5v and ground. These facilities may be used not just for the paddles as supplied with each Apple, but for any analogue or switch input and for output switching as well. Thus resistive or voltage variables may be "read", within a certain range, on or off states of equipment or devices detected, and even external equipment controlled from this connector.

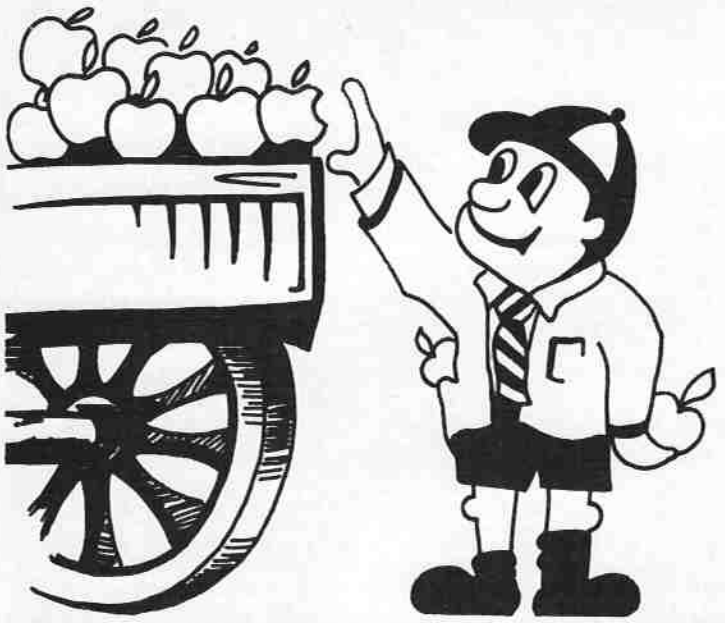
The keyboard connector, the last of the on-board I/O, is a standard type for Ascii input and is compatible with keyboards other than the Apple one – even the Maltron ergonomic keyboard can plug straight into it.

The I/O expansion slots, as they are referred to in the Apple reference manual, are a general purpose bus-type for interfacing any peripheral. These range from standard disc drives and printers, which, with various VDUs, comprise most business Apple systems, to implementation of languages other than Basic, e.g., Pascal with its language card in Slot 0, and other bus standards like RS-232 and IEEE 488. There are also the gadgets such as light pens, voice input and recognition, voice synthesis, A-D (analogue to digital) conversion, music production and many others, all of which may be used simply by plugging them in and accessing or running the software to drive them.

Of the range of peripherals in common use, there are a number of different types of each – disc drives from the standard $5\frac{1}{4}$ inch floppy, to the 8 in floppy, to the Winchester hard discs, printers in serial or parallel mode and from thermal and impact types through to the more sophisticated such as ink-jet, communications links for Apple to respond to Apple, to mainframes and the multi-user networks, and visual display units from black and white and colour monitors (usually connected to the motherboard video output), to televisions using colour cards with UHF outputs.

With all the add-on hardware available, the most elaborate of computer systems may be created based on the Apple, though for someone with a television and cassette recorder in their living room, a home computer system can be put together by buying just an Apple. This, of course, was the market the Apple II was originally intended for, and only through virtue of its design did it become so widely used in so many professions. The Apple II was not the first generally available microcomputer, but it was the most successful in its first years. Since it was first produced however, microcomputers have flourished and a vast market has been created.

So much so that today there are a hundred or more available, including ones from major computer manufacturers who were just not interested when the lowly general purpose micro first came about. Apple has brought out the Apple III with other machines in the pipeline, vying for business with competitors such as IBM, Sharp and NEC in a world market talked about in terms of billions of pounds. And all, for Apple, from the success of the Apple II.



Applecart

Monthly review of
Apple in education

Equip with the best, not the cheapest

By BOB SENIOR

"COMPUTERS are far too complicated for me to use." "I haven't got the time." "They're too expensive."

These are some of the many remarks that teachers will throw out when confronted with that terrible word "computer". The fact remains, however, that if you are not using them in some way with every one of your pupils then you are not providing them with an adequate education.

The advent of the microcomputer has brought computer power within the grasp of even the smallest business. In the last three years in Britain alone more than 35,000 Apple systems have been sold – and since 1976 450,000 world wide, making the Apple II the single biggest selling microcomputer of them all.

In an industry that is growing and changing so quickly it is no wonder that teachers feel so helpless. It is a task in itself to keep up to date with all the new developments. What I will try to do is outline a case for the Apple as a multipurpose device within a school and try, I hope, to allay some of the suspicions associated with computers.

My own experience in educational computing stems from an interest in CAL (Computer Assisted Learning). Having studied at the school of education, St Lukes College, I was fortunate enough to take up the post of lecturer in computer studies at a small further education college.

By the time I left I had become disillusioned with both the 'O' level and 'A' level syllabus and the way in which computing was treated throughout the college. This disillusionment was confirmed when in industry I began to realise that most of what I had been teaching my students would be completely irrelevant when they left college.

This, coupled with the fact that only some 4 per cent of the student body would come into contact with the computer during their time at the college, served only to strengthen my view that to have a computer studies department within a school or college is a positive disadvantage.

There are about 30,000 jobs in the computer industry at the present time and they are not for programmers or computer experts. They are for young people who have basic keyboard skills and a reasonable idea that a microcomputer is not just something you sit and program. It is a tool of the trade which makes a person's business more efficient and therefore has a whole range of applications.

Schools really should be in the forefront of micro applications and every pupil in every school should undergo a computer literacy course. A new life skill that they will need in their new world. Notice, it's not ours!

Where does computer literacy start? I believe in the primary school. "Oh dear," I hear all the primary school teachers say! And I agree. The type of equipment primary school teachers are being encouraged to buy does not make the implemention of any coherent use of the micro in the school very easy. I have a test for any micro for educational use. If you can put a disc in the drive, turn the machine on and do something worthwhile, then it is a good system. You can forget it as far as programming or loading programs in order to run them. That will only turn our overworked primary teachers off computing. So will faulty equipment which takes six months to get fixed after it has broken down in the middle of your "Egyptian" project.

So, primary teachers, you can forget learning how to program. The skill is redundant. You can forget introducing the concept of a database to your seven year olds. Let's have some fun and allow our children to enjoy using the micro as the centre for some project work.

One of the major publishers, Ginn and Co, has now gone into the packaged software market with

● *Bob Senior, BEd Hons (Exon), is Sales Development Executive with Apple UK.*

In the Monster Maze . . .

some super ideas. One that particularly catches my imagination is Expedition to Saqqara, a simulation based on the actual archaeological site at Saqqara in Egypt. The children who search for the ancient tombs are required to map out sites, manage their finances and teams of workers, record details of excavation and finds and research the meaning of the finds. The project, which can take a number of weeks to complete, uses the Apple as a source of information and stimulation for the children, most of their work taking place away from the micro.

The most exciting point is that the children actually uncover history just as the archeologists would have done all those years ago. This type of approach must hold possibilities for the way in which the humanities are taught in secondary schools. There is already a simulation of the Battle of Trafalgar. Try asking the computer what the outcome would have been if we had turned up ten minutes late.

Computer literacy must be tied in with how micros are being used in the world of business, industry and science. A number of schools are now running comprehensive business studies courses using micros. Commercial software can be purchased at a substantial discount. Payroll, ledgers, accounts, financial modelling and word processing are aspects that any self respecting course should cover. One marvellous example of really getting involved is a school for the partially hearing at Milton Keynes who bought an Apple and a Systematics stock control package and computerised the school's stock.

Computer literacy does not stop at business applications. The arts and technical studies departments must get involved. How about a computer aided design system for your technical drawing students? The Bit Stik from Robocom has been designed along the lines of a Hewlett Packard dedicated system – the only difference is that the Bit Stik plugs into the Apple and costs a little over £200. A Hewlett Packard system costs about £28,000!

Graphics tablets for the artists, music synthesisers for the music teachers – the technology is here now and in the big wide world it is being used extensively. Our children must be prepared to adapt to a business environment that is rapidly changing. Failure to do so is selling them short.

On my travels around the country I am pleased to see the Apple being used as a multi-purpose tool by teachers. Preparation of worksheets and reports using Applewriter, the £40 text processing package, storing these on disc for recall at a later date. Secretaries using word processing to lighten their load, saving standard letters on disc. Timetablers using Rostar, the most sophisticated timetabling aid ever written, which is now available in this country having undergone three years of extensive field testing in Dutch schools. All of the packages are easy to use and well within the grasp of teachers.

When I was teaching I would spend 20 per cent of my time carrying out administrative tasks. If I had had a micro that was easy to use I would have spent at least 15 per cent more of my time doing what I was paid for – teaching.

In my view there has never been a better time to invest in a microcomputer. But may I suggest a few guidelines:

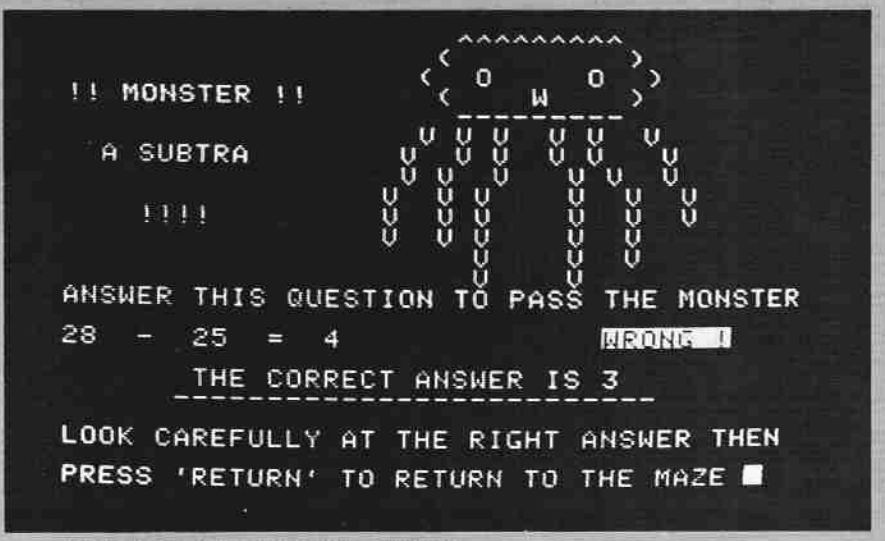
- Your machine should be capable of fulfilling all your school computing needs.
- The system must be easily upgradeable – able to grow as your needs grow.
- It should be a system that will stand up to the rigours of the classroom.
- Above all, it should be easy to use.

The final point – "ease of operation" – is by far the most important. Many of our so-called experts in educational computing would do well to start looking at this criteria in more depth when advising teachers what and when to buy. If we have any conscience at all our schools should be provided with the best equipment available, not the cheapest.

Teachers should be able to integrate computers easily into their current teaching patterns and should be safe in the knowledge that the skills they are imparting will be of use to their pupils when they leave school and join the struggle for employment.

Some of our central agencies for the furtherment of microcomputers would do well to heed some of the foregoing points. The industry moves so quickly they are certainly the least qualified to impose standards.

Useful aids to provide practice



. . . where you may well meet a Subtra.

By CLIFF McKNIGHT

SEVERAL educational programs for use with 48k Apples are marketed by Kingfisher Computer Services, two of which are Crosswords and Monster Maze.

Crosswords aims to give reading and spelling practice by presenting the child with one of 16 crossword puzzles. Eight of these are on the disc, and a utility program allows the teacher to enter up to eight more. It is menu driven and includes optional instructions and practice in keyboard use for new users.

The vocabulary used in the provided puzzles is based on the Ladybird Reading Scheme. The documentation lists the Ladybird books in which the words used in the clues and solutions first appear. For example, in Crossword 4 the words in the clues appear in books 4-8 and the words in the solutions appear in books 3-6. The explanation given for the difference is that solutions need to be spelt while clues only need to be read. The target age range is given as 6 to 11 years (books 1 to 11) but the upper age limit can be extended using the utility program.

The documentation is clear and the program runs well from the child's point of view. The graphics are hi-res and use is made of sounds which help to sustain interest. Wrong solutions can be entered if they do not clash with earlier entries (provided they have the correct number of letters) and prompts are given when all the spaces are filled if any solutions need correcting.

The biggest drawback with this program lies in the restrictions on entering new crosswords. They have to fit into a 6x6 grid and have eight clues of no more than 23 characters each (including the clue number). Given these restrictions, the utility program operates well, provided you have read the documentation and done your preparation.

It is unfortunate that a program which aims to give spelling practice should contain a spelling mistake, but at least the child user would not see this one: the utility program offers the facility to "ammend" the input!

Monster Maze is designed to give practice in the four rules of arithmetic. The child's task is to escape from a maze with as much gold as possible, gold being won (or lost) by answering correctly (or incorrectly) an arithmetic question posed by one of the monsters he encounters. There are 10 different hi-res mazes, one of which is randomly selected for each game. Like Crosswords, Monster Maze is menu driven with optional instructions and keyboard practice.

The target age range is given as 5 to 12 years, and there are seven levels of difficulty available. These are clearly defined in the documentation in terms of the operations to be used and the size of the numbers to be manipulated.

Again, from the child's point of view, the program runs quite well, with sounds used to sustain interest and appropriate illustrations of the monsters in alphabetical characters – the monsters are called an adder, a subtra, a multy and a divvy. Presumably because the program aims to give practice as opposed to teach, there is no "remedial" loop for wrong answers. The child is simply invited to look carefully at the correct answer and loses some gold.

The documentation says that "when play has finished a game analysis is displayed enabling the teacher to examine any errors made and performance over a number of consecutive games may be compared". An analysis of each game is certainly available, with questions asked, answers given and whether or not each answer was right. However it seems like the only way to get a hard copy of this is to write it out. Also there is nothing to stop a child simply proceeding to another game even if all the answers given were wrong. By starting another game, the analysis of the preceeding game would be lost. It would be more useful, therefore, if analyses were stored and a print option provided.

One of the problems which maths programs typically encounter is that the keyboard doesn't have a division sign "÷". Monster Maze deals with this problem by presenting the addition and subtraction questions in the form of "A + B =" or "A – B =" but using a written form for multiplication and division, e.g., "A multiplied by B =" or "A divided by B =". Similarly, although the keyboard has arrow keys, → and ←, they do not display as such on the screen so instructions to their use resort to –> (minus greater than) and <– (less than minus). Obviously, these are not problems specific to these programs, they are problems which programs like these have to overcome.

On the whole then, these programs worked well and would be a useful and interesting way of providing practice. Kingfisher market two demonstration discs at £5.50 each, one of which demonstrates Crosswords, Monster Maze and Fraction Action. Actual play is not possible with these discs, but their cost is fully refundable if they are returned with a further order. Crosswords costs £18.75 (£10.25 for the cassette version) and Monster Maze £10.45 (£8.75 for the cassette version).

Program for success

COMING second in last year's national computer programming competition wasn't good enough for the Robert Clack Comprehensive School in Dagenham. So this year, they won the competition.

Working on an Apple II, four boys from the school wrote a program to assist an interior design company. Their win meant a cash prize of £400 from the sponsors, Barclays Bank and Kent University, and a disc drive and controller from Apple UK.

Now all four of the boys, two of whom are pictured with their Apple, are hoping to make a career in computers when they leave school.

School application of Cesil

THE gremlins regrettably took a hand in the listing with Dr D.A. North's article last month. The corrected version from line 8025 is as follows:

```
8025 L$(X) = A$:ST$(X) = A$:OPD$(X) = A$:RE$(X) = A$
8030  NEXT X
8035 EP = 0: REM  END OF PROG MARKER
8040  GOTO 810
8999  REM *******ERROR TRAPPING ********
9000  PRINT " OPERATING ERROR (CODE ";PEEK (222)")"
9002 Y =  PEEK (222)
9005  IF Y = 253 THEN  RESUME : REM  IGNORE CONTROL C
9010 GOTO 810
20000  REM  ********** MEMORIES USED ********
20010  REM  *  A$  KEYBOARD REPLIES        *
20012  REM  *  N   NO. OF MEMORY LOCATIONS*
20020  REM  *  PC  PROGRAMME COUNTER       *
20030  REM  *  DP  DATA POINTER            *
20040  REM  *  ED  END OF DATA             *
20050  REM  *  AC  ACCUMULATOR VALUE       *
20060  REM  *  L$  LABELS                  *
20070  REM  *  OPD$ OPERANDS               *
20080  REM  *  RE$  PRINT FIELDS           *
20090  REM   *  L   ALLOWED STRING LENGTHS  *
20500  REM  ************************************
```

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increase your Apple harvest

C.O.R.P., a system of program generators that writes suites of Applesoft programs, is now available. It is the most advanced comprehensive and beneficial programming tool available for use with the Apple – a software system that writes 'stand-alone' programs! 48K Apple II, DOS 3.3 and 2 disk drives required.

The capability of C.O.R.P. is infinite with the power and versatility to speed up programming whilst at the same time making the task more simple and error free. It generates complete Applesoft programs that execute independently and may be modified by the user, based on information supplied in the user's own everyday language.

A knowledge of programming is unnecessary. Perfect professional Database type programs can be written by complete beginners in minutes! Yet for those who want to learn to program, a comprehensive BASIC LANGUAGE tutorial is also provided. A Users' Newsletter is published at frequent intervals. C.O.R.P. comprises:

- a data entry program generator
- a printed report generator
- a diagnostic package including: memory check, drive, printer and disk checks and many more
- a Basic language tutorial
- a (booting) menu generator
- a forms letter generator
- a user demo with program examples
- a superb Datafile Editor
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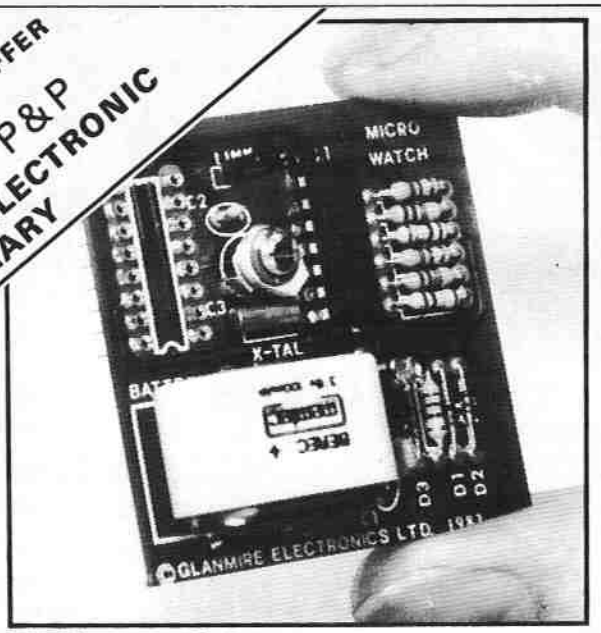

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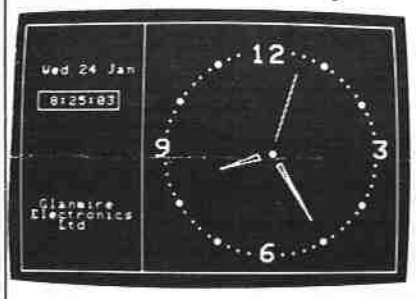

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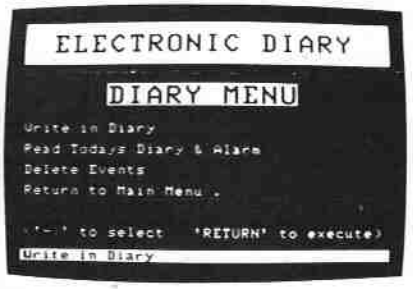

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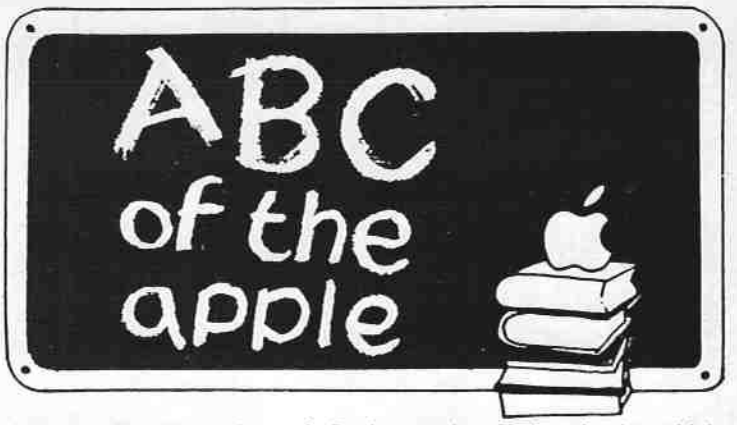

Applesoft. A version of Basic used on the Apple which contains numbers stored in floating point notation.
Application. Software developed for the Apple to do a specific task.
A/D Converter. A device (interface card or chip) which is used to convert analog signals into digital format.
Acoustic Coupler. Links the Apple to standard telephones to enable a communications link to be set up over the public network.
Asynchronous. Transporting data in and out of the Apple in one direction at a time.
Boolean. A method of handling logic statements, popular on computers.
Boot. Loading operating systems and software into an Apple, from scratch.
Byte. Assemblage of 8 bits to form a basic storage area, sufficiently large to contain meaningful information – instructions, numbers and characters.
Bit. Basic means of storing electronic data in binary format (on/off).
Basic. Beginners All Purpose Symbolic Instruction Code – the most popular method of entering instructions to operate a computer. A high level computer language, with most commands in recognisable English.
Bug. An error in a software program, or a fault in a computer.
CAL. Computer Assisted Learning – a method of teaching subjects using the computer.
Chips. A common term used to describe the small black composite objects which contain even smaller silicon 'chips' (used in the correct sense), linked via wires of minute dimensions to the terminal legs.
CP/M. An operating system used on microcomputers which use a Z80 microprocessor.
Configure. Design and set up a system containing elements of hardware and/or software.
Colour Card. An interface card which when plugged into an I/O port in the Apple enables colour to be output onto a colour monitor or standard colour TV.
Compiler. A utility which converts a high level language program, which needs to be interpreted every time it is run, into a machine code program, which runs faster, needing less or no interpretation.
Cursor. A flashing marker on a screen, indicating where the next item of input data will appear.
Data. Information stored in numerical or text format, used as transients in programs, for calculations or information storage.
Database. A large body of stored data, supported by utilities for editing, sorting, entering new data and so on.
Disc. A magnetic storage device, either hard or flexible (floppy), which can store data or programs in digital format.
Disc Drive. A unit which contains a reading and writing head for loading data onto a disc, or reading data from a disc. The drive also contains the motor for rotating the discs. Hard discs, because of their greater volume, are usually housed in sealed units. Flexible discs are easily swapped.
Dump. Transfer amounts of data (such as the 8 Kbytes required to store a picture), straight onto a peripheral, like a printer or disc, with little ceremony or reformatting.
DOS. Disc Operating System. A series of routines which need to be loaded into the Apple to enable it to initialise, save to and read from disc, plus numerous other associated refinements.
Execute. To carry out an operation in a program, or 'run' a program. *(Also may be done to the operator after pressing RESET with a disc running!)*
Hardware. Generic term for all manufactured computer equipment.

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ABC of the apple

Interface. A device for linking one finite component with another, such as a printer interface to link a printer to an Apple.
Interactive. An operation which produces an immediate result.
Hi-res. A shortened term for high-resolution graphics.
Hard copy. A dumping of data or a program held in the Apple onto a printer.
Interpreter. A program, such as Basic, which needs to be translated by the computer into machine code each time it is run.
Integer Basic. A form of Basic (the earliest Apple version) which stores its numbers in integer format (no decimals). Useful even now for higher accuracy and speed in long calculations.
I/O Port. Interface cards are connected to the Apple by placing them in one of the eight long slots at the back of the Apple. These are the Input/Output Ports.
K. Kilo – 1000 – a convenient notation for describing volume. 64k represents 64000 bytes.
Microprocessor. The Basic 'chip' which controls the memory, data transfer and other functions of the microcomputer. The Apple uses a 6502 'processor'.
Mainframe. A very large computer, capable of handling many jobs at any one time and many terminals. They cost a lot of money.
Machine Code. A language which is directly understandable by the Apple computer. High level languages have to be converted to machine code, either by compiling or interpreting, before they can be used.
Mother Board. The large printed circuit board (PCB) in the Apple, which holds all of the chips, the processor and the input/output ports.
Macros. A series of instructions which can be linked together to be operated by one or two key strokes, or instructions.
Paddles. External devices which when connected to the games socket in the Apple can be used to provide variable input of data values for games and graphics routines.
Pascal. A high level language, much in vogue at the moment, which needs compiling to run. Pascal is a structured language which, once compiled, runs faster than Applesoft Basic.
Program. A series of instructions connected in a logical format to enable the Apple to complete a task.
RAM. Random Access Memory. A 48k Apple has 24 2k RAM chips installed on the mother board. Bytes can be accessed within RAM by direct addressing methods (an index points directly to the byte required) very quickly.
ROM. Read Only Memory. A number of standard and custom designed programs can be stored on a ROM, where they are only available for reading data. Programs can only be 'burned' into the ROM chip with specialised 'burners'.
Sequential Access. Accessing memory in a linear as opposed to a random fashion. Cassettes are restricted to very slow sequential access. indexed Sequential Access is, however, a very efficient merging of both methods, using pointers to link records once accessed.
Software. Generic term for programs and digitised information, which is used to command the hardware.
Utilities. Programs which have been developed to make life easier for those writing software. These include editors, compilers, character generators and so on. Some can be incorporated into programs to improve their running.
Visual Display Unit. Any screen which is used to display the current operating status of a microcomputer.
Z80 Card. A very popular alternative microprocessor to the Apple's 6502, which uses the CP/M operating system. The Z80 processor mounted on an interface card enables the Apple to run CP/M and CP/M based programs.

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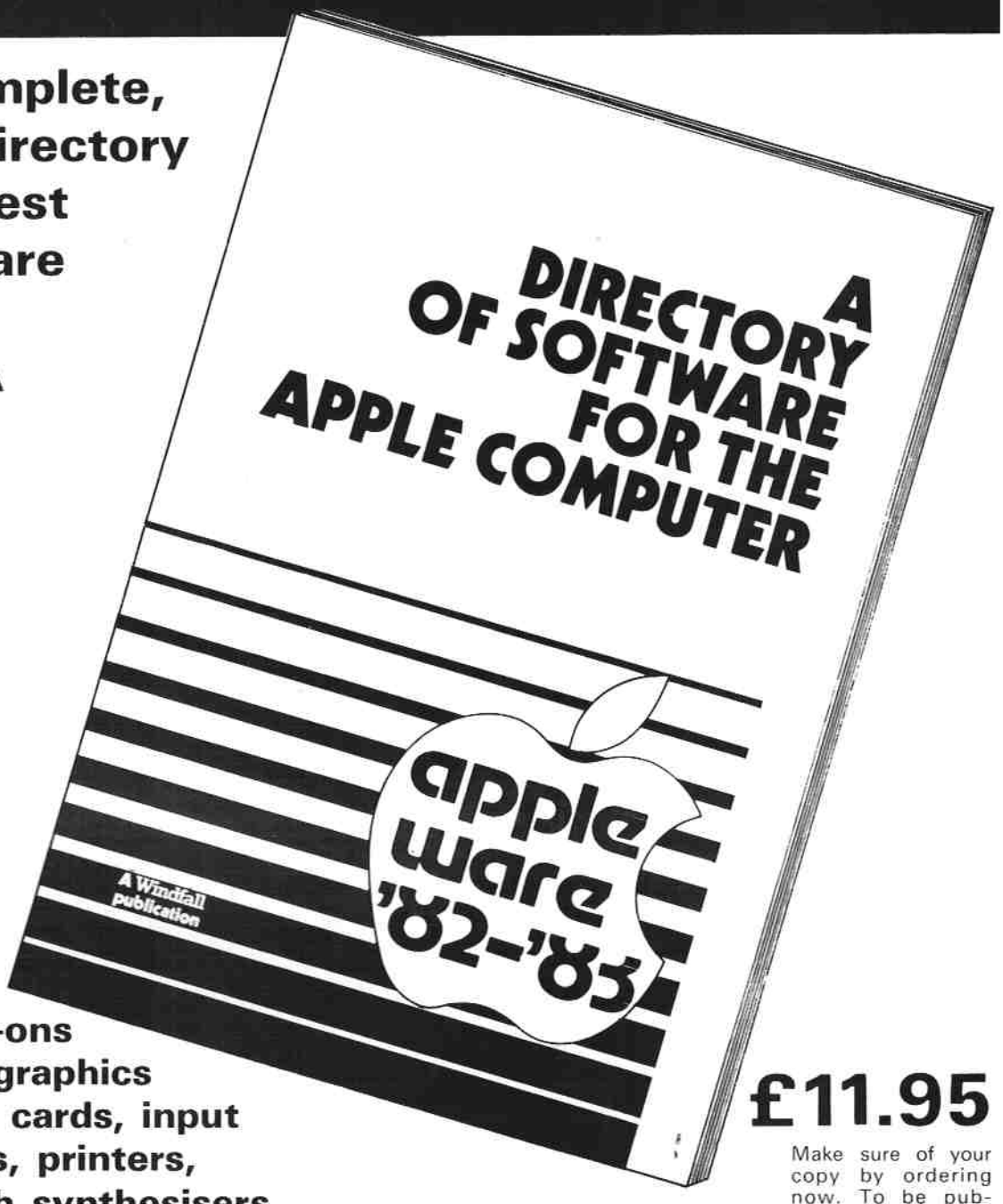

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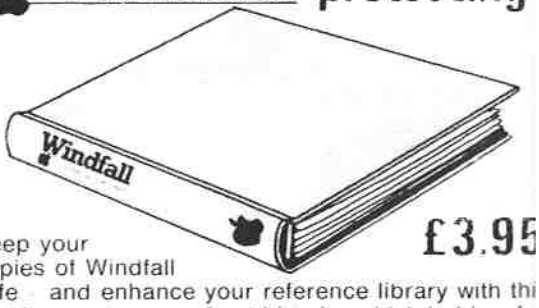

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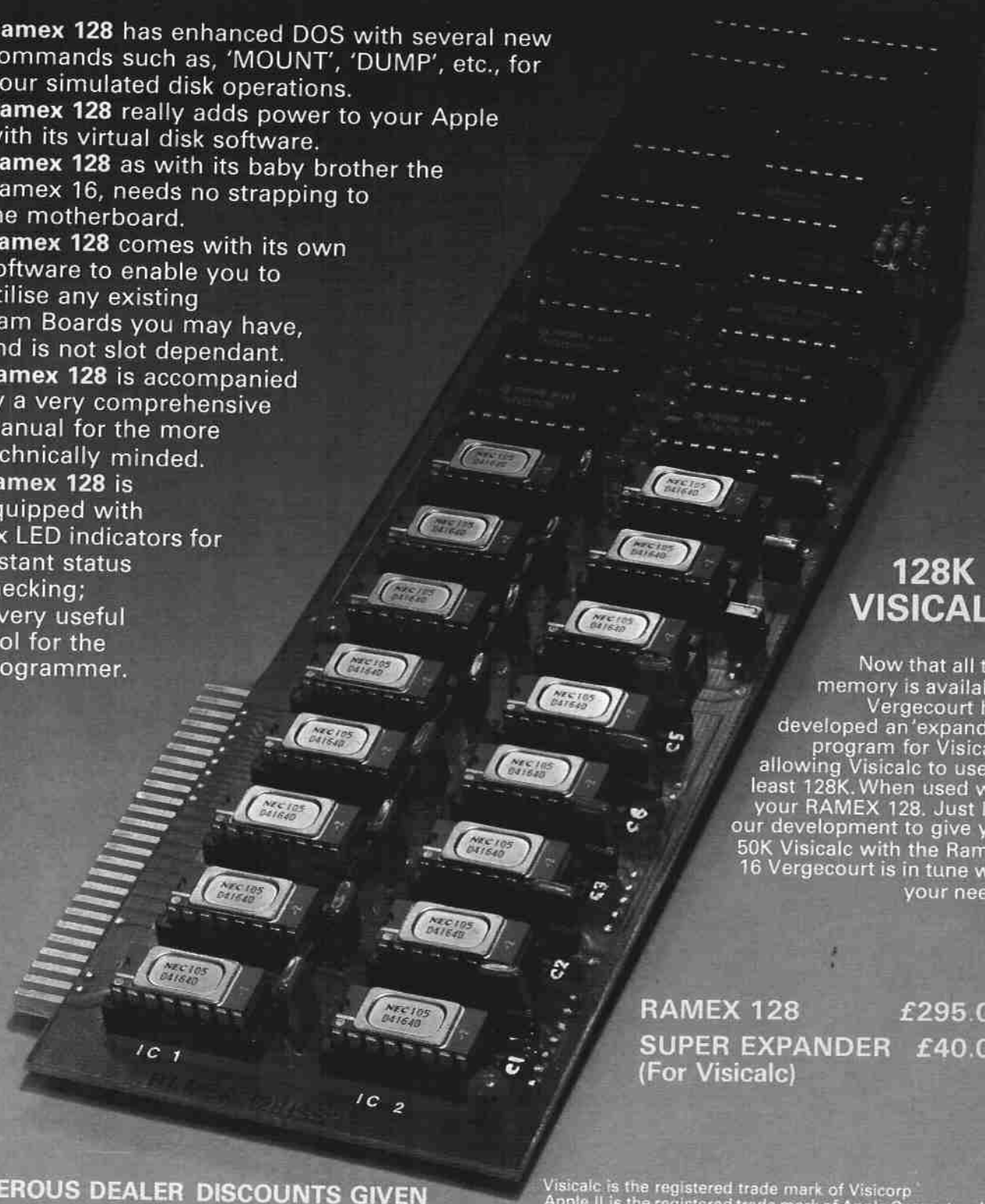

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