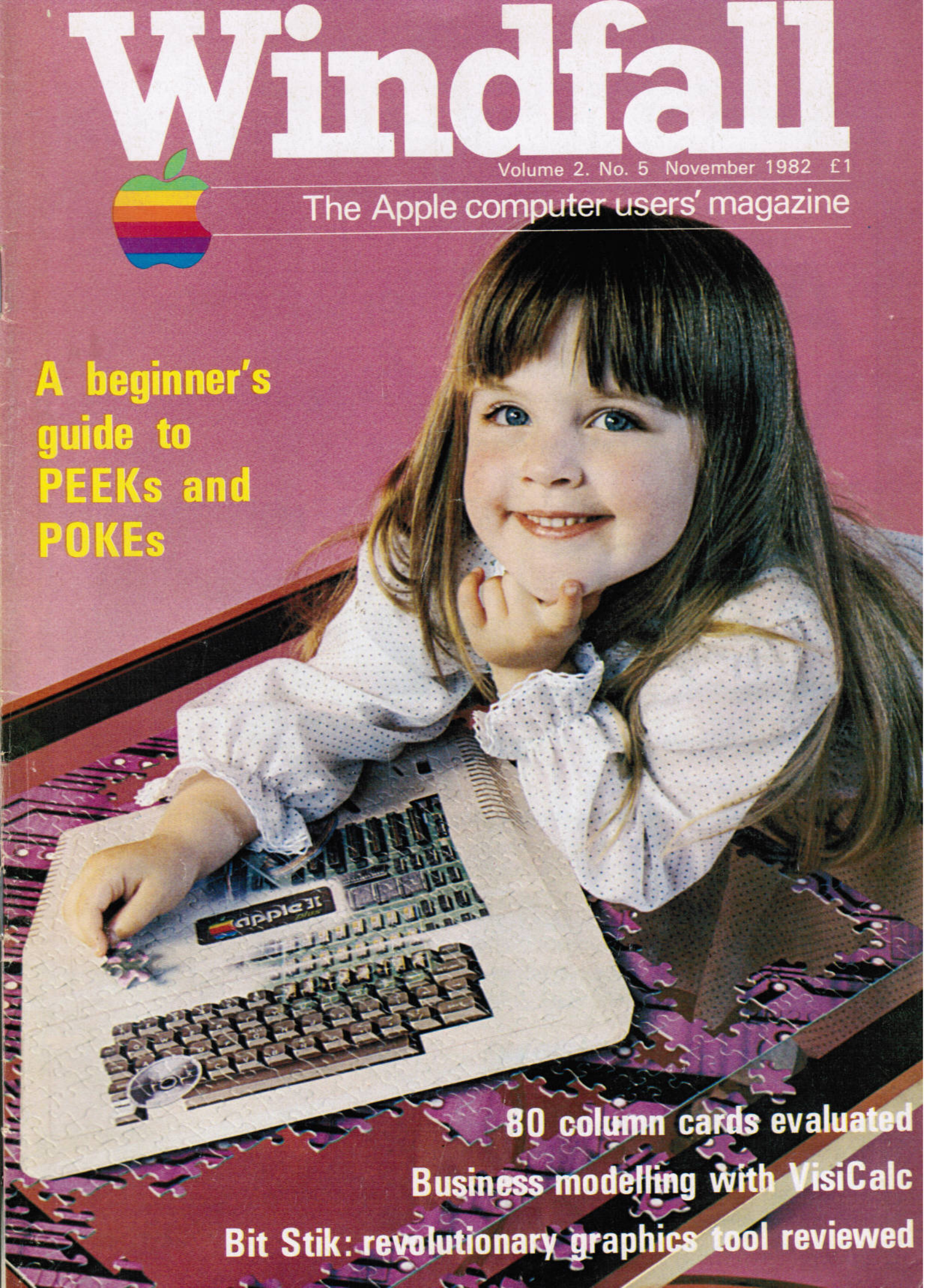
Windfall

Volume 2. No. 5 November 1982 £1

The Apple computer users' magazine



Are You Being Served?

We're Micromite Computers with the world's first genuine desk-top Winchester storage unit with inbuilt self-diagnostic facilities.

And we're looking for APPLE DEALERS. Right now!

The Micromite links up to 256 CP/M* Apples and offers shared resourcing through a local area network.

The Micromite has automatic File Lock for existing CP/M* application software and Record Lock for purpose-written application software.

The Micromite offers from 10 mb to 160 mb of Winchester storage with 20 mb tape streamer option for security copying.

Fill in the coupon now and receive full details by return post.

Please send me full details of your genuine desk-top Winchester storage unit with inbuilt self-diagnostic facilities – the Micromite.

Name _____

Position _____

Company _____

Address _____

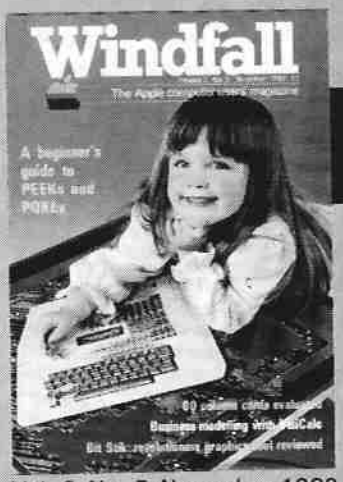
_____

_____ Tel: _____

Ref W

*Reg trademark of Digital Research Inc.

Micromite Computers, Regency House, 2 Rockstone Place, Southampton SO1 2EP. Tel: (0703) 334144



Vol. 2 No. 5 November 1982

LISTING

Managing Editor
Derek Meakin

Features Editor
David Creasey

Art Editor
Peter Glover

Technical Editors
Peter Brameld
Cliff McKnight
Max Parrott

Advertisement Manager
John Riding

Advertising Sales
John Snowden
Mike Hayes

Tel: 061-456 8383 (Editorial)
061-456 8500 (Advertising)
Telex: 667664 SHARET G

Published by:
Database Publications Ltd,
Europa House, 68 Chester Road,
Hazel Grove, Stockport SK7 5NY.

Subscription rates for 12 issues, post free:

£12 – UK
£13 – Eire
£18 – Europe
£15 – USA (surface)
£25 – USA (airmail)
£15 – Rest of world (surface)
£26 – Rest of world (airmail)

Trade distribution in UK and Ireland by Cemas Ltd, New Road, St. Ives, Huntingdon, Cambridgeshire PE17 4DB. Tel: 0480 65886.

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.

What now?

Until now statistical analysis, data preparation, business forecasting, multivariate analysis and time series analysis have always been a good reason for a headache!

Personal Data Analysis . . . will take a lot of the pain away!

Personal Data Analysis is the package to use with your Apple II computer whenever the analysis and interpretation of quantitative data is called for.

Personal Data Analysis is a suite of statistical routines covering the following areas:-

Data Preparation and Survey Analysis	(DATA PREP)
Correlation and Analysis	(GENREG)
Time Series Analysis	(TIME)
Box Jenkins Modelling	(BOXJEN)
Linear Programming	(OPTIM)
Simulation Modelling	(QSIM)
Classification/Principal Components Analysis	(CLUST)
Analysis of Variance	(ANOVA)

Data Prep is the "building block" and each separate module can be added to this to provide a powerful and complete statistical analysis system:-

If you have to analyse the result of questionnaire surveys, the evaluation of product performance and processes of production, planning stock levels, designing a product mix or the testing of economic models, Personal Data Analysis and your Apple computer will provide you with the answers.

Personal Computers

218 & 220-226 Bishopsgate, London EC2M 4JS Tel. 01-377 1200 Telex 888264

NAME _____

ADDRESS _____

_____

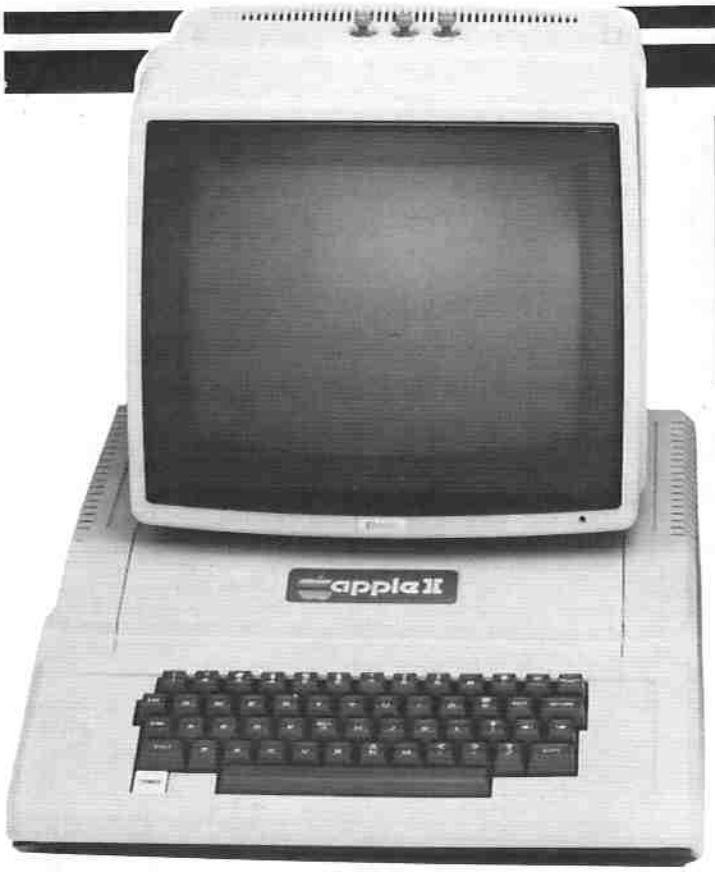
COMPANY _____ POSITION _____

SPECIAL INTEREST _____

I DO/DO NOT OWN AN APPLE II

A CUMANA FIRST FOR APPLE II

Quality Disk Drives, the 8035, with over twice the capacity per drive



A BIG PLUS! includes SWITCH UNIT for 80 or 35 track use

£745

In 80 Track Mode capacity is **327680 bytes** on each drive.
In 35 Track Mode capacity is **143360 bytes** on each drive.
And all Apple Software including ½ track software can be read.
Apple owners will find the above units . . quiet and dependable . . real professional users units giving essential standards of data integrity.
Please add VAT to all prices. Delivery at cost will be advised at time of order.

£219

CUMANA LTD

Unit 1, The Pines Trading Estate, Broad Street,
GUILDFORD, Surrey. GU3 3BH.
Telephone: (0483) 503121. Telex: 858306

A low cost Apple Computer single Disk Drive . . . a really quiet, dependable unit.

Apple is the Registered Trade Mark of Apple Inc.

DEALER ENQUIRIES WELCOME. WE OFFER GENEROUS DEALER DISCOUNTS

COMPUTECH for apple

Authorised dealer, service centre and system consultancy

COMPEC '82
16-19 NOVEMBER
OLYMPIA

STAND 1230
GROUND FLOOR
GRAND HALL

SPECIALISTS IN SELECTING THE RIGHT SYSTEM AND THE RIGHT SOFTWARE FOR YOUR APPLICATION

DON'T DELAY

CONTACT COMPUTECH

FOR APPLE II AND APPLE /// SYSTEMS

AND

COMPUTECH FINANCIAL ACCOUNTING PACKAGES

Payroll	£375
Invoicing and Stock Recording	£295
Sales, Purchases and General Ledgers	each £295

PLUS

COMPUTECH UTILITIES DISK £20
for reliable error checking copying, diskette scan, interpret and patch, etc.

COMPUTECH CHAIN MAIL £45
a mailing merging document processor which may be used with text files, including random files and Applewriter 1.1 binary files.

COMPUTECH GRAPHICS DISK £30
for printing Apple pictures and graphs on Epson and Microline (free with printers purchased from Computech).

COMPUTECH TERMINAL UTILITIES from £130
Apple to Apple or Apple to Mainframe.

ALSO

Visicalc, Applewriter and other Apple Software (Prices on request)

COMPUTECH HARDWARE

DIPLOMAT Video Digitiser - store a frame from a video camera in a fiftieth of a second, process and print images.	£195
DIPLOMAT Parallel Interface	£80
DIPLOMAT High Speed Serial Communications Interface	£85
DIPLOMAT RAM 16 Memory Expansion	£95
DIPLOMAT Clock/Calender	£80
Lower Case Character Generators including Applewriter enhancements	£50
MICROMUX Data Exchange (Max 16 Ports)	from £850
MAXTRIX Printers, Microline and Epson with graphics and up to 200 cps	from £230
Microline Optional Character Generators	£15
DAISY WHEEL Printers, Olympia, Qume, Ricoh, etc.	from under £1000

Prices exclude VAT, Carriage and Packing. Trade enquiries welcome.

FOR FULL DETAILS PHONE FOR COMPUTECH'S PRODUCTS AND PRICES PACK AND A FREE DEMONSTRATION

Apple National Accounts Dealer
We provide quality service and support to small businesses and to major national and international organizations and government departments.

COMPUTECH SYSTEMS

168, Finchley Road, London NW3 6HP. Tel: 01-794 0202

AGENTS THROUGHOUT THE UK AND OVERSEAS

SATURN 128K

GOOD NEWS for APPLE II users

Now you can get 80 column VisiCalc display on Videoterm, Smarterm and Sup·R·Term,

as well as extra memory for your VisiCalc models.....

VC Expand 80 software together with Saturn's 128K board and a Saturn 32K board, will give up to 177K for VisiCalc models, with an 80 column display on any of the 80 column boards mentioned. VC Expand 40 will give the same additional memory without 80 column display.

The Saturn 128K board was one of the original large memory boards and comes complete with software to allow program memory expansion APPLESOFT and disk emulation in APPLESOFT, PASCAL, and C/PM. (With other boards you often have to pay extra for these features – or they're not available at all!).

Saturn 128K	£359
Saturn 32K	£149
VC Expand (40)	£ 59
VC Expand 80	£ 69
Videx Videoterm	£195
Sup-R-Term	£195
Smarterm	£185
Videx Visicalc 80 col. pre-boot disk (no memory expansion)	£34.95

£50 VOUCHER

LIMITED PERIOD OFFER

To help you make the right decision in buying a 128K board for your Apple, we're giving a £50 voucher, redeemable at any participating Apple dealer, against the purchase of any VISICORP program other than VISICALC. Coupons redeemable through Pete & Pam Computers.

Pete & Pam Computers

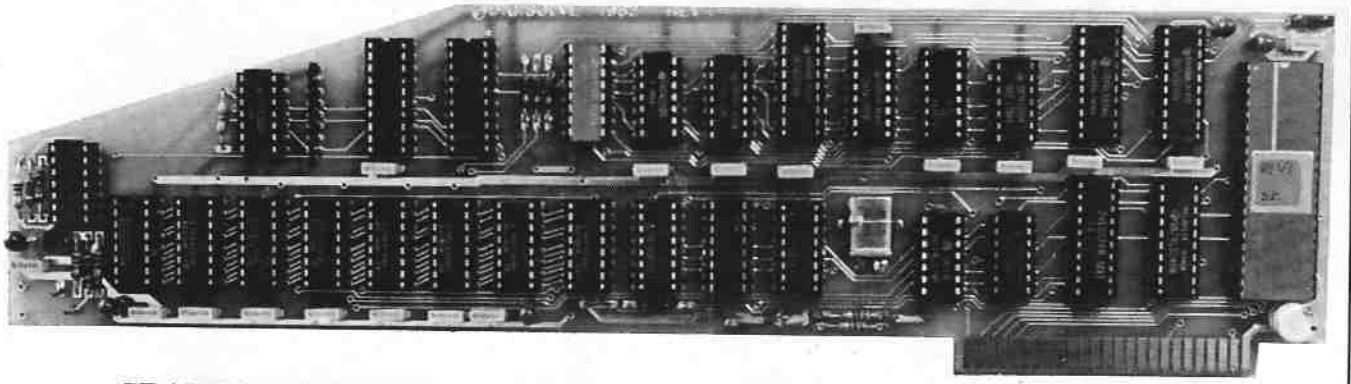
Head Office:
NEW HALL HEY ROAD,
ROSSENDALE, LANCS. BB4 6JG
Tel: Rossendale (0706) 227011
Telex: 635740 PETPAM G

London Office:
103-5 BLEGBOROUGH ROAD,
LONDON, SW16 6DL
Tel: 01-769 1022/3/4 & 01-677 2052
Telex: 923070 PPCOMP G

BARCLAYCARD VISA

Prices do not include VAT – please add 15% to your remittance. **Post & Packaging FREE.**

512 × 512 GRAPHICS FOR APPLE II



GRAPHICS TOO SLOW? Digisolve's Apple II high resolution graphics card can draw up to 1,500,000 pixels per second. A hardware vector generator frees the Apple's processor from drawing lines. Simply send start co-ordinates and direction to our card and it does the rest.

NOT ENOUGH MEMORY? Digisolve's high resolution graphics card has it's own 64K bytes of memory to store two 512 x 512 pictures. Now there is no need to reserve large chunks of the Apple's memory in Hi-Res Mode.

RESOLUTION TOO LOW? Digisolve's high resolution graphics card gives 4 times the resolution of the Apple's HI-RES mode and with two picture buffers.

NEED CHARACTERS WITH GRAPHICS? Digisolve's high resolution graphics card has its own character generator which can draw in variable size and orientation. With a maximum density of 85 characters by 57 lines you can display a large worksheet and keep a second picture buffered at the same time.

PROGRAM WRITTEN IN ASSEMBLER? Digisolve's high resolution card is easy to use with assembler, integer basic and Applesoft. We supply programs that show you how.

CAN'T AFFORD A GRAPHICS TERMINAL FROM: TEKTRONIX, HEWLETT-PACKARD ETC.? Digisolve's high resolution graphics card costs £399 + P.P. & V.A.T. and turns your Apple into a powerful graphics machine. Compare the performance, what machine can have the resolution 512 x 512 (a 32K byte picture) with a 1:1 aspect ratio?

NEED A MONITOR? Digisolve have high resolution green screen 15″ monitors carefully styled to match the Apple, and are built to comply with office equipment standards for £160 + P.P. & V.A.t.

COMING SOON: 512 x 512 with 2 picture buffers and 64 colours with interfaces to all popular micro/mini computers.. 512 x 512 monochrome standalone terminal board.

Digisolve

DIGISOLVE LTD · LAMBSON GROUP Telephone: (0977) 513141
Aire & Calder Works · Cinder Lane
Castleford · West Yorks · WF10 1LU

ABOUT DIGISOLVE: We aim to make computers friendlier with better displays of information. Contact us about your special problem – we have probably solved something like it already.

DEALERS AND SOFTWARE HOUSES: Enquiries welcome

Access VISA

Apple II and Applesoft are Trademarks of Apple Computer Inc.

Introducing the customised Apple II for industry ...from MC Computers

MC Computers are authorised Apple O.E.M. Dealers.

This customised version of the acclaimed Apple II personal computer has been designed specifically 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. Safe access to computer is provided by user-definable, front panel push buttons only. For program development work or modification, an optional Qwerty keyboard can be plugged into the system.

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 rack mounting.

MC Computers' industrial Apple is also compatible with their full range of industry standard computer I/O cards for data acquisition and control applications.

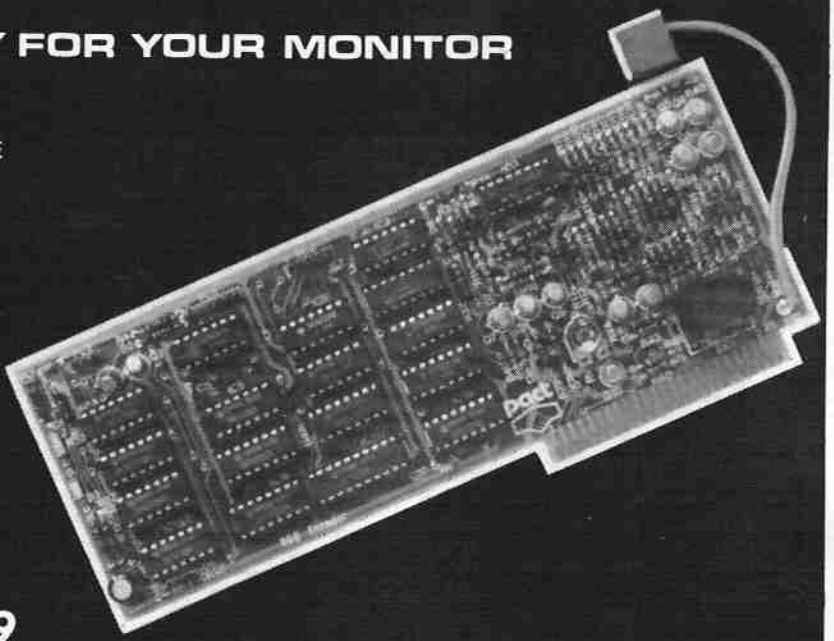
So, if you're faced with a dilemma over the choice of processors for industrial use, contact MC Computers now!

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

MC COMPUTERS

pact PLUG-IN VERSATILITY FOR APPLE USERS

VERSATILITY FOR YOUR MONITOR



RGB COLOUR INTERFACE

THE HIGHEST QUALITY COLOUR AVAILABLE

* Fully saturated Apple colour set
* Alternative hi-intensity colour set
* Software selectable full flood background colour
* Software selectable text (foreground) colour
* Duochrome mode * Anomaly filter
* 80 column compatible

£120

MULTI-COLOUR TEXT ADAPTOR

* A hardware add-on
* Allows individual words to be produced in any of 16 different colours

£50

80 COLUMN DISPLAY INTERFACE

* Normal and inverse character sets standard
* Compatible with Pact RGB colour card
* Compatible with wide range of software
* Supports Basic • Pascal • C/PM etc.

£149

VERSATILITY FOR YOUR PRINTER

SERIAL/COMMUNICATIONS INTERFACE

* The one card for all RS232 applications
* On board serial and communications protocol
* Options for specialised firmware
* Full handshaking features
* Generates all standard Baud rates

£99

SERIAL PRINTER DRIVER

* Low cost serial card for dedicated serial printer use
* Baud rates from 75-19200

£68

PARA-GRAPH

The card to choose for parallel dot matrix printers
Features many word processing type text commands and hi-res graphics dump commands

£75

PARA-GRAPH +

The one card for all parallel printers

Load the on-board alterable ROM to suit your particular printer from the disc supplied. Under normal usage the firmware will remain indefinitely. However, should you wish to use your Para-graph + with another printer, simply reload with the appropriate firmware.

£95

CLIP-ON FAN MODULE £50

(THE PREVENTATIVE MEDICINE)

Avoid costly and time consuming system malfunction due to overheating

Apple and fan powered up simultaneously by illuminated switch on front of module

* Silent running
* Robust case
* Simple clip-on module

pact

* Installed in seconds
* Integral mains lead
* Impedence protected

Further details from: Pact Electronics Ltd., 224 Edgware Road, London W2 1DN.

Telephone: 01-402 8842/6103
Telex: 22861

American Express Access

ALF

AD8088 PROCESSOR CARD WITH FTL

FTL is the easy way to speed up your Applesoft programs. You can run all your Applesoft programs with no changes, and without 'compiling' them. Plus, FTL doesn't reduce your available memory. The key is ALF's AD8088 Processor Card, which adds a fast, 16-bit computer to your Apple. FTL, the Formula Transfer Link, sends Applesoft formulas (*,(,↑, LOG, EXP, COS, SIN, TAN and ATN) to the card for fast processing and is also compatible with most compilers.

FTL is just one use for the powerful AD8088 Processor Card. There's a Multiple Event Timer (MET) for timing critical routines in your programs, with resolution to 50 uS for scientific applications. Coming soon are **MS-DOS** (the IBM Personal Computer's DOS), **CP/M-86**, and a fast 3-D high-res graphics card that connects through the AD-8088's versatile expansion port.

£229.00

COOLING SYSTEMS for APPLE...

COOL STACK **£69.00**
APPLEFAN **£68.60**
PACT FAN MODULE **£49.00**

Prevent overheating.... Call Pete & Pam Today....

PLANNER CALC

by TARGET
FOR APPLE II WITH Z-80

£35.00

UTILITY PROGRAMS

DOS TOOL KIT	41.00
SCRIPT III	64.29
MENU GENERATOR	25.95
MACRO SCREEN EDITOR	32.95
PROGRAMMING AIDS 3.3	49.95
MCAT 2.0	15.95
CRAE 2.0	15.95
ALD SYSTEM II	49.95
ALD SYSTEM FOR APPLE III	49.95
EDIT 6502	69.95
TASC (Applesoft Compiler)	109.00
LISA ASSEM. LANG. DEVEL. SYSTEM	59.00
SPEED—ASM	25.95
EXT. PROG. FACILITY IV	52.95
EXPEDITER II+	75.00
BAG OF TRICKS	25.95
MON+	25.95
SUPER DISK COPY III	19.95
DISK RECOVERY	18.95
DISK ORGANISER II	18.95
MULTI-DISK CATALOG III	15.95
APPLESOFT + STUCTURED BASIC	15.95
DOS PLUS	15.95
QUICKLOADER	15.95
APPLESOFT PROGRAM OPTIMISER	12.95
APPLE SPELLER	44.95
IMAGE PRINTER	25.95
THE BUG	32.95
BUILD USING	19.95
EDIT SOFT	19.95
ACE (Applesoft Command Editor)	25.95
APPLE DOC	25.95
ASCII EXPRESS	44.95
PROGRAMMERS UTILITIES	13.95
LIST MASTER	25.95
DISK **DOCTOR** (CP/M D. RECOVERY)	70.00
HIGHER FONTS	11.95
DIRECTORY MANAGER	21.95
PROGRAM LINE EDITOR	25.95
SOFT SEVENTY	32.95
INTEGER BASIC COMPILER	99.95
GLOBAL PROGRAM LINE EDITOR	42.95
PROGRAM LINE EDITOR IN ROM	39.95
KRAM	59.95
SUPER KRAM	89.95
THE MANAGER (Memory MGT. SWRE)	19.95
APPLE EXTENDED EDITOR	44.95
FASTDOS (INC. DOS ACCESS SPEED)	19.95

WIZARD

BPO

16K and 32K BUFFERED PARALLEL OUTPUT PRINTER INTERFACE CARD FOR APPLE II and APPLE II PLUS COMPUTERS FOR OKI, EPSON & ANADEX

WIZARD BPO 16K	£149.00
WIZARD BPO 32K	£169.00

BOOKS

APPLE MACHINE LANGUAGE	11.95
PASCAL PROGRAMMING FOR APPLE	10.45
APPLESOFT LANGUAGE	7.65
INTIMATE INST. IN INTEGER BSC.	5.55
APPLE BASIC FOR BUSINESS	11.20
APPLE PASCAL GAMES	11.45
PROGRAMMING THE 6502	9.70
6502 APPLICATIONS BOOK	10.25
6502 GAMES	10.25
6502 SOFTWARE DESIGN	5.50
6502 APPLICATIONS	9.70
CP/M USER'S GUIDE	4.95
APPLE INTERFACING	7.65
CIRCUIT DES. PROGS FOR APPLE	11.15
APPLE II USERS GUIDE	10.95
VISICALC HOME & OFFICE COMPN.	11.50
THE POWER OF VISICALC VOL.1	6.95
THE POWER OF VISICALC VOL.2	6.95
KIDS AND THE APPLE	13.95
GUIDE TO PROGRAMMING IN ASOFT	11.50
SCIENCE & ENG. PROGRAMS (AII)	11.50
A*SOFT BASIC DATA FILE PROG.	8.95
ASSEMBLY LANG PROGRAMMING	9.50
OSBORNE C/PM USERS GUIDE	3.95

THE MAGAZINE OF THE IBM COMPUTER

Tells you how to put together the best IBM system and how to get the most out of it. Subscribe today.

Name _____
Address _____

☐ 6 issues £17.50 ☐ 12 issues £32.50
☐ Cheque enclosed ☐ VISA ☐ Access Card
Card No. ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

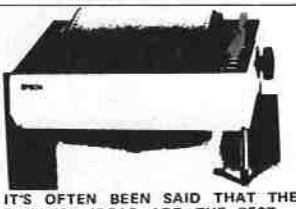
Send to:- Pete & Pam Computers, New Hall Hey Rd., Rossendale, Lancs., BB4 6JG

If not fully satisfied return mailing label within 15 days for full refund.

Pete & Pam Computers Golden Promise

WE WILL NOT BE UNDERSOLD. SATISFACTION OR MONEY BACK GUARANTEE.

We believe we have the largest range and stock of Apple-related products in the country. From games to business software, floppy disks to interfaces, Apple Computers to Zenith Monitors.



IT'S OFTEN BEEN SAID THAT THE SIMPLEST IDEAS ARE THE BEST — AND JUST LOOK AT THIS ONE FOR PAPER STORAGE.

stilts *Pete & Pam Computer's Stilts are four legs which can be installed on to your Epson MX80 in seconds — giving you room for 3 inches of paper.* **£5.95**

NEW!

DB MASTER

Special Edition for HARD DISK now available from Pete & Pam - Compatible with CORVUS and XCOMP PHD Hard Disk Drives - Allows you to store an incredible number of records.

£299.00

samram

16K MEMORY EXPANSION BOARD FOR APPLE II.

The card that's so good, our Engineer has put his name on it!

Retail Price £65.00

Function Strip

NEW FROM VIDEX

The Videx **Function Strip**™ adds a whole new dimension to your Enhancer][™ Apple][™ Function Keys. Now you can have dedicated keys for your macro definitions. Program often used word processor commands, words or phrases into your **Function Strip**. Programmers will find it a significant aid to be able to define often used commands and statements. VisiCalc™ users can define often used commands and file names for single keystroke ease of use.

The Videx **Function Strip** is a low cost, versatile strip of pressure sensitive switches. The **Function Strip** adheres to the Apple]['s lid - just above the keyboard and connects to the Enhancer]['s keypad connector port. The **Function Strip** is completely compatible with keypads connecting to the Apple][motherboard.

Suggested retail price: $79.00

Function Strip	£54.95
Enhancer II	£99.00
OR... BOTH FOR A SPECIAL PRICE OF:	£149.00

SPECIAL OFFER

VISICORP DESKTOP/PLAN BROWN BINDER EDITION FOR APPLE II.

£79.00

SOFTWARE COPYING SYSTEM
£99.00

APPLE CARE

MACHINE COVERS

APPLE II	5.95
APPLE & 2 DISKS	7.95
APPLE & 12" MONITOR	7.95
APPLE, 2 DK & 12" MON.	9.50
APPLE, 2 DK & 9" MON.	8.95
SINGLE DISK	3.45
2 STACKED DISK	4.45
9" MONITOR	4.95
EPSON MX80/70	5.45
PAPER TIGER 445/60	7.95
APPLE /// INC. MON	12.95
MX100	8.95
QUME 5 W/TRACTOR	10.95
NEC 12" MONITOR	7.50
HITACHI 12" MON.	7.50
DECCA RGB MONITOR	8.95
SIRIUS KEYBOARD	4.45
SIRIUS PROC & MON	12.95

HEAD CLEANING
Clean read/write heads the way leading manufacturers recommend 5¼" disk head cleaning kit. **£18.95**

DISKS & DISK BOXES
BASF single sided, single density disks.
10 for **£17.90** 50 for **£84.50**
100 for **£159**
Kass-ette storage boxes **£2.45**

TRIPLE YOUR DISC ACCESS SPEED
No hardware modification required.

FastDOS
Fast Disc operating system for APPLE][computers.
Completely compatible with DOS discs
Loads and saves standard DOS files.
Completely compatible with all DOS/APPLESOFT programs that access DOS through standard hooks, including FID and MUFFIN.
Executes all standard DOS commands.

Comparative timings:	**DOS**	**FDOS**
Bloading integer basic	13 sec	3 sec
Cataloging a 12 file disc	2 sec	1 sec
Saving a 10 sector program	6 sec	2 sec
Saving a 100 sector program	32 sec	7 sec
Loading a 100 sector program	24 sec	7 sec

Requires 48k
Recommended Retail Price £19.95

Pete & Pam Computers

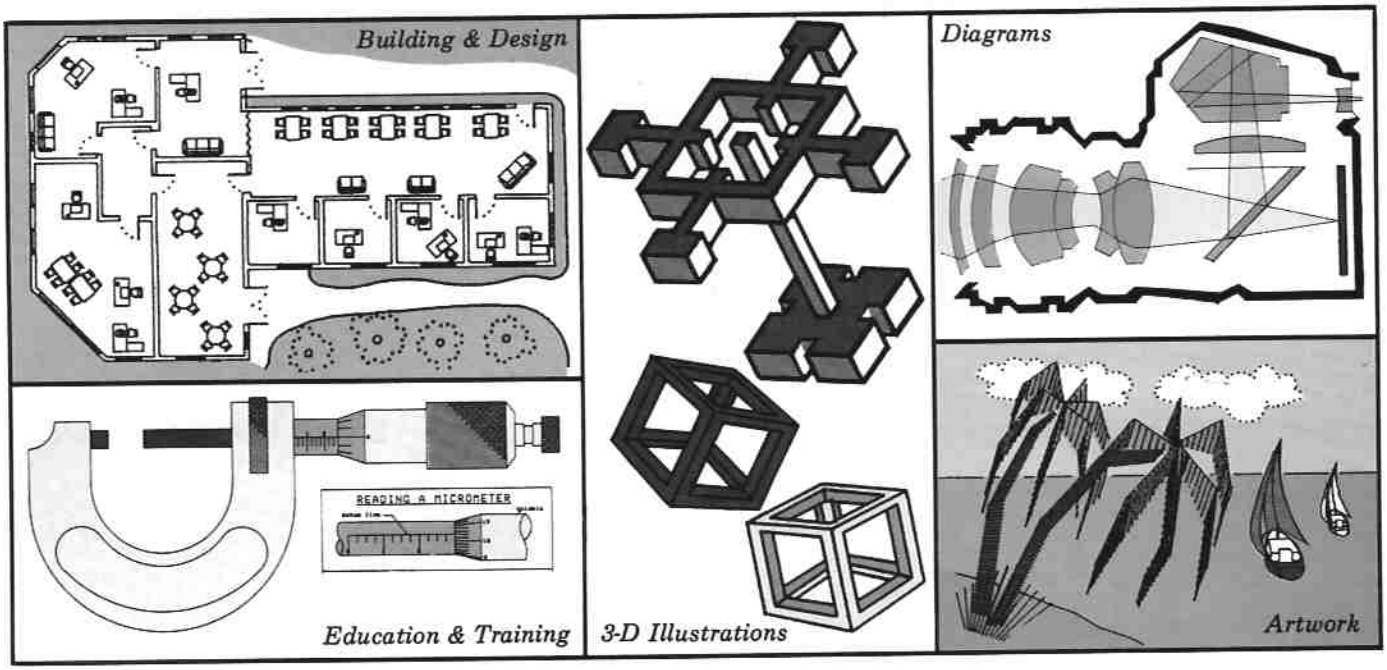
Mail Order & Distribution:
New Hall Hey Road,
Rossendale, Lancs., BB4 6JG
Phone: (0706) 227011
Telex: 635740 Petpam G

London Retail:
103-5 Blegborough Road,
London, SW16 6DL
Phones: 01-769 1022/3/4

Norwegian Agent:
The Norwegian Software House
Address Okernveien 145
Oslo 5
Telephone (02) 22 89 78

Prices do not include VAT please add 15% to your remittance
Postage and Packing FREE

Products available from dealers throughout the U.K.



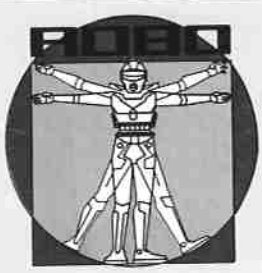
Draw on our resources

The Robocom BIT STIK interactive graphics package is a powerful new system that brings sophisticated Computer Aided Design within the reach of many organisations that had previously thought such systems were too costly or not relevant to them.

The BIT STIK system gives engineers, technical designers, architects and many others the facility to produce and save full colour graphic material quickly and economically. But time and cost savings are not the only benefits of the BIT STIK. The quality of output improves too as key staff are released from routine work so that they can use their time more effectively. The system is very simple to use and can usually be mastered after a morning spent with the 'Quick Draw' manual supplied.

The best way to appreciate what the BIT STIK can do for you is to see the system demonstrated either at one of our weekly London seminars or have a demonstration on your premises.
Whichever way you choose, send the coupon now and start drawing on our resources soon.

To: Robocom Ltd.,
CIL Building, Goodwin Street, London N4 3HQ
Please send me:
Details of your weekly seminars in London ☐
Literature on the Robocom BIT STIK ☐
Please arrange a demonstration on my premises ☐
(please tick appropriate box)
NAME..... POSITION.....
COMPANY.....
TYPE OF BUSINESS.....
ADDRESS.....
..... TELEPHONE NO.....



BiT STiK

Interactive Graphics System

The Scotch Diskette is no miracle product. It locks in the data you feed it. It gives you data back, when you need it. Simple, really.

But there's more than that to a Scotch Diskette. It doesn't cause errors. It doesn't lose vital information. It's totally reliable. That's why we call it "the Key to Data Security".

Scotch Reliability

Ever since they introduced the first computer tape, over 25 years ago, 3M have specialised in magnetic media. Today, every Scotch Diskette comes to you 100% certified for error-free performance. Small wonder that 3M media has been chosen for use as the world-wide amplitude reference standard.

3M: Impeccable Service

It doesn't matter what sort of equipment you have. If it uses floppy disks, chances are there's a Scotch Diskette to fit it. And if ever you need advice or help with product selection, handling or storage, there's a nationwide network of 3M distributors to serve you - impeccably.

Whether your system uses computer tape, disks, data cartridges, cassettes or floppy disks, 3M has the key.

For the address of your nearest distributor, contact Data Recording Products, 3M United Kingdom PLC., 3M House, PO Box 1, Bracknell, Berks RG12 1JU. Telephone: Bracknell 58502.

3M: Your Key to Maximum Data Security.

RELIABILITY IMPECCABLY SERVED

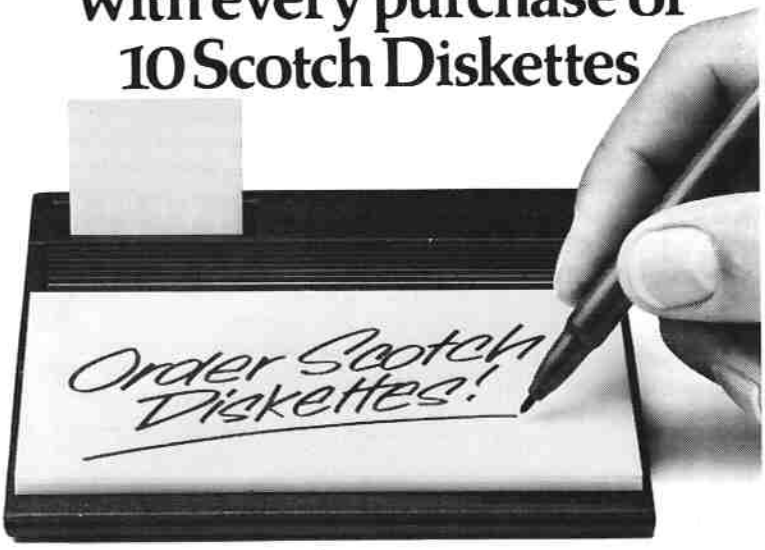
3M and Scotch are trade marks

3M

Scotch Diskettes Special Offer

YOURS FREE

This sleek Post-it Note Tray with every purchase of 10 Scotch Diskettes



However reliable a Scotch Diskette might be, it's hardly the sort of thing you'd use to scrawl a note on.

You'd reach for the handiest bit of scrap paper for that job. Or, if you really were living in the 20th Century, you'd reach for a Scotch Post-it Note.

Scotch Post-it Notes: the ultimate in noticeable noting.

Scotch Post-it Notes are rather special sheets of paper.

For one thing, they're the brightest of yellow in colour. Which makes them eminently noticeable, even on the untidiest of desks.

For another, they incorporate a strip of special adhesive on their backside which makes them eminently stickable to any surface - and just as removable. Without leaving the slightest trace of tacky-ness.

All of which means you can stick, remove and re-stick your Post-it Note to anything you like and it will stay stuck - without clips, pins, staples or tape.

The ultimate in noticeable noting?

Very nearly, if you include the unique Scotch Post-it Note Tray.

The Scotch Post-it Note Tray: noticeable notes at your fingertips.

Designed specifically to hold your Post-it Notes, the Scotch Post-it Note Tray is your handy access to instantly noticeable noting.

It's made of sturdy acrylic and it accommodates any of the various pads of Post-it Notes.

Plonk it on your desk and it will sit, tight and true, without budging or squirming, thanks to its weighted, non-slip base.

So you can scribble your messages with one hand while holding the 'phone with the other.

Altogether, the Scotch Post-it Note Tray could take the grief out of your briefs!

And its yours to possess absolutely free of charge.

The Scotch Post-it Note Tray Offer.

All you have to do to acquire your own Scotch Post-it Note Tray (complete with a pad of Post-it Notes) is buy 10 Scotch Diskettes.

On delivery of the Diskettes you will receive your Post-it Note Tray - absolutely free of charge.

To obtain your Scotch Diskettes contact your nearest 3M sales office or complete the coupon below.

But do it now to ensure delivery of your Scotch Post-it note system: the ultimate in noticeable noting. Offer closes 31 December 1982 or while stocks last.

3M Regional Offices:
Belfast: (0232) 42811: Phyllis Carson
Birmingham: (021) 236 5077: Wendy Jones
Glasgow: (041) 332 9622: Janis Galbraith
Manchester: (061) 236 8500: Sonia Bassett
London: 01-659 2323: Mike Banks

To: Danny Welch, 3M UK PLC, 3M House, FREEPOST, Bracknell, Berks RG12 1BR.

I would like to order 10 Scotch Diskettes. Please contact me.

NAME

POSITION

COMPANY

ADDRESS

TELEPHONE No:

Registered in England at 3M House P.O. Box 1, Bracknell, Berks, RG12 1JU No. 241888

Talk to Prestel with your Apple

Now, with the Owltel communications package, you can use your Apple as an intelligent Prestel or Viewdata terminal. With Owltel, you get all the hardware and software needed for interfacing with Prestel. No external modem is needed, and the system is designed to meet British Telecom approvals.

And Owltel offers other prospects – linking with private or international Viewdata systems, for example – or even forming the heart of an integrated Apple-based communications network.

To boost your Apple's communications capabilities, call Mike Gardner on 0279 723848.

Owl Micro-Communications

The Maltings, Station Road,
Sawbridgeworth, Herts., CM21 9LY.
Telephone: 0279 723848.

Vlasak Computer Systems

YEARS EXPERIENCE WITH APPLE COMPUTERS AND ACCOUNTING/MANAGEMENT CONTROL PROGRAMS

NATIONWIDE DEALER NETWORK

VLASAK STATIONERY SERVICE
Continuous N C R Stationery

This service specialises in fast turnaround custom continuous stationery. N C R multi-part sets are a particular speciality. For ORBIT software users a range of standard stationery is available. Any design can be handled including any combination of colours and parts, either with the same or different printed layout on each part. Any depth which divides exactly into either 22" or 24" is available subject to minimum depths of 5½" and 4" respectively.

KWIK-SNAP

Kwik-Snap provides you with the ability to mount any standard document you use now on a continuous tractor-fed carrier paper. For example, if you use a word processing system it can save the time usually wasted inserting and aligning letterheads. Copies can also be handled either via N C R or carbon paper.

VLASAK DISK PRODUCTS
Megastor

– an 8-inch disk drive unit compatible with Apple computers which comes complete with interface, DOS and utility software. Two storage capacities are available; 1 Mb and 2 Mb.

Protect

– the *only back-up unit* for your Apple *III* Profile Winchester disk. Copy the entire disk in just 20 minutes on to 10 diskettes. Hold complete back-up cycles to ensure your complete data and program integrity.

THE ORBIT BUSINESS SYSTEM

A comprehensive integrated business system designed to run on the smallest through to the very largest Apple system. The capability of the system is limited only by the amount of disk storage attached to your system. Sales, Purchase and General Ledgers including Profit and Loss, Balance Sheet and Budget reports are all handled. Invoicing and a Stock system complete the package. ORBIT is probably the most powerful, flexible and fastest package available for Apple hardware and exploits fully the potential offered by Apple/UCSD Pascal.

VLASAK COMPUTER SYSTEMS
VLASAK HOUSE, STUART ROAD, HIGH WYCOMBE
BUCKS HP13 6AG Tel (0494) 448633 Telex 837413 VLASAK G

I would like further information on the following VLASAK products:

- ☐ Disk products
- ☐ ORBIT business system
- ☐ Stationery service
- ☐ Please arrange a demonstration with my local dealer
- ☐ Please forward your dealer pack

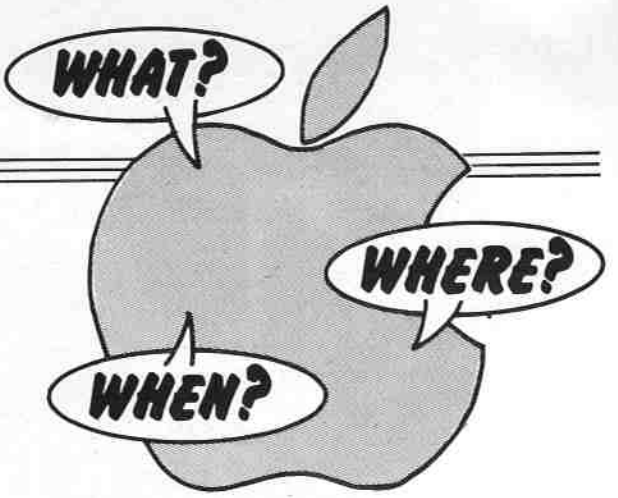
Name _____

Address _____

_____

Post Code _____ Tel. No: _____

WHAT'S NEWS...



By David Creasey

Early warning from an Apple could aid babies

AN Apple is being tried out in an early warning system to detect hip dislocation in newly born babies. At present doctors check for deformity at birth by listening for a tell-tale click in the joint, but the condition often goes unnoticed and is not discovered until the child begins to walk. Treatment at this stage means a series of operations (with no guarantee of success) and six months in plaster – this at a time which in normal circumstances is one of the most active cycles of a child's life.

Discovery of the defect at birth, however, can result in a simple and effective cure. No operation is necesssary and the child is kept in a nappy-splint for three months. It is normally immobile at this time, and so there is little change in the normal way of life.

Professor Raymond Mollan, professor of orthopaedic surgery at Queen's University, and doctors at Musgrave Park Hospital, Belfast, have tested the system on 300 children who had previously been examined by specialists and passed as normal. They found five dislocated hips.

They have now started a two-year project involving 6,000 babies in Northern Ireland which, they hope, will prove the system works.

The project was established under the auspices of the British Technology Group in conjunction with Medical and Scientific Computer Services of Lisburn, Northern Ireland, who developed the software. The system involves diagnosis using tiny microphones taped to a baby's hips. These convert any noises in the joint into a graph on the Apple monitor, taking a sample every 100 microseconds. The graphs generated from a congential dislocation differ dramatically from the norm.

System prototypes, one of which was demonstrated recently on the BBC's Tomorrow's World programme, use a 48k Apple with a 128k RAM card to store a total of seven seconds of data. A complex machine code program controls and displays the signals, which together generate 150 screenfuls of graphs.

Hip check in action

Prototypes of the Apple-based equipment should be available by the end of the year and on completion of successful trials will be marketed world-wide. Mr Robin Jelly, of Medical and Scientific Computer Services, says nurses or midwives could easily use the equipment to screen newborn babies with a high level of diagnostic accuracy.

And Professor Mollan said: "Congenital dislocation of the hip must be diagnosed within four weeks of birth. With proper treatment at that time the child is cured completely, and we guarantee a normal hip. Compare that to years of hospitalisation with no chance of a normal hip, and you can appreciate the difference early diagnosis makes."

Happening in Gradenhutten

WINDFALL is always keen to expand its contacts and its contributor base. We are looking forward in particular to hearing more from Marsha Marlatt of Gradenhutten Ohio, who intrigued us when in a letter asking for writer's guidelines, she said: "I've an idea that you may welcome as an article in your publication.

"I am also a firm believer in a 'world village' concept for new technologies, especially those which accommodate dear Mother Nature."

Marsha added as a postscript: "The only thing that ever happened in Gradenhutten was the little publicised massacre of 96 Christian Indians (Moravians)."

What she didn't tell us was the idea she'd had for that Windfall article.

The winner

"DEFINE an Ideal Micro" was the theme of a competition organised recently by MicroDecision magazine. Entrants had to place in order of importance 12 features including price, graphics capabilities, choice of programming languages, disc storage space, availability of software and expansion capabilities, and to sum up what they required from their dream machine.

The winner, Dr Nigel Peckett, of Stafford College of Further Education, was allowed to select his own ideal micro. He chose an Apple.

THEY'RE TURNING UP ALL OVER THE PLACE . . .

APPLES turn up in the strangest places, and there seems to be no limit to what you can do with them or where you can take them. Shoppers at Rawtenstall market in Lancashire can be forgiven for thinking they'd stepped into the 21st century when they found an Apple lurking on fruit and cheese stalls. But their surprise was nothing to that of a contractor who saw an Apple being unearthed from a roadworks trench he'd had been digging.

Giving the computer a day out was Paul Witney of Pete and Pam Computers who'd thought of the idea of a do-it-yourself 1983 calendar.

Professional photographer Gary Lomax of Waterfoot followed the couple to a hunting lodge and photographed ducks nosing around the machine and even got a shot of the Apple underwater (gubbins removed and mains electricity disconnected, we understand) at the local swimming baths.

To complete its lessons in "people literacy" the Apple was taken off to the local hairdressers for a blow wave and then to Ski Rossendale for a turn on the slopes.

Porker program

PROGRESSIVE pig farmers are taking the traditional idea of apple sauce with their pork into the twentieth century. That's the lesson to be learnt from the recent Greenmount Pig Fair where one of the main attractions was an Apple system demonstrated by Farmplan Agricultural Computer Systems.

The fair saw the first public display of an enhanced pig breeding management program developed by the company. With it the keen farmer can accommodate records of a 1,200 strong sow breeding herd on just one disc. A pig-fattening program is also available. At the touch of a button, farmers can now pinpoint key management factors such as food conversion, sales, margins and mortality.

All this for less than the cost of a small tractor.

All change

NAME dropping is becoming something of a habit in the micro world. In September, for example, MC Computers was forced to change the name of its industrial Apple, Apple Pi, because Phillips Business Systems, which owns the Pye company, complained of an infringement of trade mark. "Pi" has now become "The Industrial Processor."

The latest casualty is the name Applefan, which is being phased out after gentle pressure from Apple UK. A new name will be announced next month.

What is unusual here is that it is taking place at all, as Hiteck Products, which manufactures the Applefan – a cooling device – actually owns the trademark for that name. However Apple has asked politely for a change and Hiteck, which says it enjoys excellent relations with Apple, has agreed, even going so far as to submit new names for approval by Apple's Hemel Hempstead headquarters.

In the United States at one time there was a rash of people producing micro components and incorporating the name Apple into the title. Some of these were not up to "official" standard and the Apple image suffered.

Apple UK is therefore acting in its best interests to establish a general principle – although it is obviously not making a specific attack on Applefan. Far from it. Microsense, the forerunners of Apple UK, knew what the Applefan was to be called even before it went into production, Hiteck went ahead and registered the name, and Apple UK actually distributed 1000 leaflets promoting the product to its dealers last March.

A spokesman for Apple said the company will not allow anyone to call their product by their name. "Our policy is to actively discourage this," he said, "to protect our reputation and name.

"We don't want to discourage anyone from manufacturing add-ons, because they do a great service to Apple users. It is in the marketing sphere where we feel that only products that come out of our company can be called Apple."

Light relief

AND with all this attention to names, full marks for ingenuity to Stafford dealers Phil Kingsland and Bob Bristow. I discovered their company name while browsing through our database (required reading at *Windfall*) and was left with a recurring sense of delight at the subtlty of it – Micro Applecations.

Also riding high on the smile-making stakes is Canadian John Winthrop Whallen. He has developed a full production CAD system for the Apple II using two disc drives and no special hardware. He calls it SALAD – for scale-alterable-layered-accessible-drawing.

Naturally, he refers to the layers as salad dressings.

What you don't know . . .

WHILE Apple Inc has been busy waging war in far flung reaches of the world against copycat products in the hope of stopping their entry into the lucrative American and European markets, it seems that one has already arrived.

Windfall spoke to Kram Electronics,

one of the dealers that has taken on the Diablo-distributed STCII, and which has brought the fight into the open with an advertisement in a national magazine.

Next to a photograph of what appears to be an Apple II case, the advertisement states: "You know the case! You know the software! What you don't know is the price! Don't ask for an *****, ask for a Golden Delicious!"

Nigel Backhurst of Kram Electronics has no qualms. "The way we are selling it there is no breach of Apple's copyright," he said. "The machine uses Apple's own expansion cards and Apple disc drives. There is no Apple firmware resident in the STCII and all software, including Applesoft, is disc based.

"As far as we can see the disc drive, controller and other software is bought legally from Apple in the United States – and I don't really know what Apple can do about it.

"The distributors buy the DOS system in the US and under American law it becomes the purchaser's property after the sale and can be used without a breach of copyright.

"The machine has eight slots, in accordance with the international standard slot system, it has 48k RAM and the games controller slot is in the same position as the Apple's."

Apple UK has always been strongly opposed to price cutting because it feels this would have a bad effect on the level of support provided. Was this a problem for Kram?

"Not at all," said Mr Backhurst. "We have our own engineering service here and Diablo provide a 12 month guarantee on the new machine."

He conceded that externally the STCII "hasn't quite got the finish of the Apple" but added "At a rough guess, they bought the Apple moulds."

We asked Brian Reynolds of Apple UK what he thought about the new machine – and the advertisement. He said: "It would appear that they are passing their product off as an Apple machine and if that is the case then we won't hesitate to take action."

To further complicate the matter and to bring home the threat from the Far East, it is understood that dealers at the recent PCW show in London were asked if they would like to take on bulk quantities of Apple III copies which would retail here for around £750.

Presenter Tony Bastaple: Minority audience for pioneering programme

Toehold on ITV

AT long last ITV is beginning to realise there is such a thing as personal computing. They may even be becoming aware that it is one of the fastest growing activities in the country. And someone must have told them that it was the popularity of the computing series on the Other Channel earlier this year that led to the phenomenal demand for the new BBC micro.

So it's not too surprising that ITV should finally steel itself to enter the brave new world of computing. Which it has done this month with the start of a half hour series of programmes called Database.

But not so fast. They're still not completely convinced it is what viewers want to watch. So they've slipped it into the schedules at the switch-off time of 11.30pm. Even worse, it's restricted to the Thames ITV area, which means it can only be seen by a minority of the viewing public.

Which is rather sad news for producer Michael Feldman and presenter Tony Bastaple. Being eminently sensible people, they are both Apple users themselves.

Said Michael: "I bought mine two years ago. I mainly use it for making notes when preparing a programme or indexing articles. But to be honest, I spend most of my spare time at the moment playing with Apple Logo, which I brought back with me after a recent visit to the States."

apple '83
2nd National Apple User Exhibition

STANDS are already being reserved for the biggest Apple event of 1983 – the Second National Apple User Exhibition and Convention.

Apple '83, sponsored by Windfall, will build on the tremendous success of last year's event. It returns to the Fulcrum Centre, Slough, on June 3, 4 and 5.

Before Apple '82 fears were expressed that Slough was too out-of-the-way for a national exhibition. But they proved groundless, and many thousands of users made the most of a unique Apple occasion.

The only real complaint was that the area allocated for the exhibition was not big enough to meet the demand for space. Many exhibitors said they would have taken double the space had it been available.

So for Apple '83 the exhibition area will be considerably enlarged. We are taking over the whole of the Thames Hall complex on the two upper floors of the Fulcrum Centre, which will permit a much more rational grouping of stands and far more room for visitors.

Lectures, again from some of the leading names in the Apple world, will be held in the complex's Planet Theatre.

Potential exhibitors who wish to enquire about stand reservations should contact John Riding on 061-456 8500.

IMAGINE IT...

NEW

NOW WITH DUAL HI-RES GRAPHICS

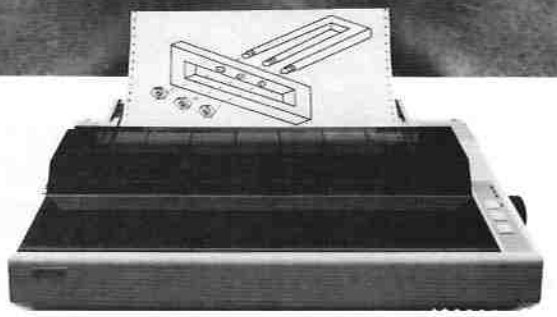
CAPTURE IT.

Completely Redesigned. Now, the Grappler+.
The original Grappler was the first graphics interface to give you hi-res screen dumps from your keyboard. The new Grappler+ with *Dual Hi-Res Graphics* adds flexibility with a side-by-side printout of page 1 and page 2 graphics.

Interfacing the Grappler+ to a wide range of printers is easy as changing a dip switch. 4K of exclusive firmware makes the Grappler+ the most intelligent, full-featured Apple® Printer Interface made. And, the Grappler+ is Apple III compatible.*

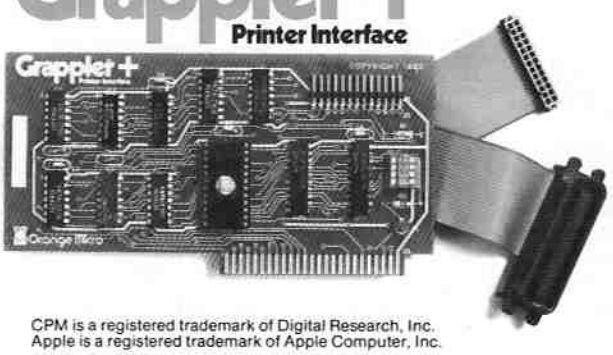
The imitations are many, so insist on the #1 Apple Graphics Interface on the market. Insist on the Grappler+. Available now at most Apple dealers.

*Requires additional software driver.
**Requires graphics upgrade.



ACTUAL APPLE II PRINTOUT USING GRAPPLER AND EPSON MX100

With The Grappler™+ Printer Interface



CPM is a registered trademark of Digital Research, Inc.
Apple is a registered trademark of Apple Computer, Inc.

The Grappler+ Features:
• Dual Hi-Res Graphics • Printer Selector Dip Switch • Apple III Compatible* • Graphics Screen Dump • Inverse Graphics • Emphasized Graphics • Double Size Picture • 90° Rotation • Center Graphics • Chart Recorder Mode • Block Graphics • Bell Control • Skip-over-perf • Left and Right Margins • Variable Line Length • Text Screen Dumps.

The Grappler+ also works with Pascal and CPM.

The Grappler+ interfaces with the following printers:
• Anadex • Centronics • Datasouth • Epson** • NEC • C-Itoh • Okidata**

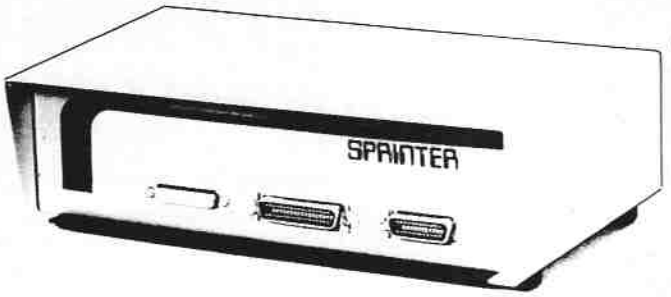
The original Grappler is available for IDS 460, 560, Prism, Microprism.

Orange Micro Inc.
3150 E. La Palma, Suite G
Anaheim, California 92806
U.S.A.
Tel: (714) 630-3620
Telex: 183511 CSMA
Foreign Dealer Inquiries Welcome

HOW TO USE YOUR PRINTER WITHOUT WASTING COMPUTER TIME:

Your computer is capable of sending data at many thousands of characters per second but the fastest Epson can only print 100 characters per second and most daisywheel printers are even slower.
This means your computer is forced to wait for the printer to finish one line before it can send the next. A costly waste of time.

THE NEW SPRINTER ACCEPTS DATA AS FAST AS YOUR COMPUTER CAN SEND IT.
SPRINTER stores the data in its own memory buffer and then takes control of the printer. This frees your computer for more productive functions.



Problem: Connect a 20 character per second Word Processor serial printer to your computer but don't tie the computer up for 20 minutes during a 25,000 character print.
Answer: SPRINTER

Problem: Attach a letter quality serial printer to a parallel output computer for Word Processing.
Answer: SPRINTER

Problem: Save money by attaching a low cost matrix printer to a serial output computer.
Answer: SPRINTER

Problem: (Insert your interfacing problem here)
Answer: SPRINTER

SPRINTER *COSTS £249.00 including P&P (VAT extra)*

SO WHY WASTE ANY MORE TIME?

CALL US NOW FOR YOUR SPRINTER AND LET YOUR COMPUTER GET ON WITH SOME REAL COMPUTING.

GB COMPUTER PRODUCTS LIMITED, 14 GREENWOOD GROVE, WINNERSH, WOKINGHAM, BERKSHIRE, RG11 5LH
Telephone 0734 786635 or 791678, Telex 847783 GDB CS G

SPRINTER IS A TRADEMARK OF MUTEK

OPEN FRAME MONITORS AVAILABLE FOR OEM'S

The 'PRINCE' of Monitors

offers better Monitoring.

24MHz Bandwidth-ensures a clear crisp display.

Available with P4 White
P31 Green
AND L1 ORANGE

Scan: 625 lines/50 Hz. Deflection: 110°. Active raster: 240 x 172mm. Bandwidth (3dB): 10 Hz-24 MHz (at 3dB points). Character display: 80 characters x 24 lines. Horizontal frequency: 15625 Hz ± 0,5 KHz. Vertical frequency: 50 Hz. Horizontal linearity: ± 3%. Vertical linearity: ± 2%. Geometric distortion: ± 1.5%. EHT (at zero beam current): 13kV ± 0.5kV. Power drain: 30 Watt approx. Voltage supply: 110V A.C. 50 Hz/220V A.C. – 50 Hz/240V A.C., 50Hz/ ± 10% upon request. Video input: 2 x BNC – or CINCH – or PL 259, (composite video) negative sync, input 0.5–4V p.p. across 75 Ohms. X-Ray radiation: conforms to I.E.C. Spec. No. 65. Overall dimensions: 320 x 270 x 265 mm. Weight: 7 Kg. approx. Ambient temperature: 0–45°C.

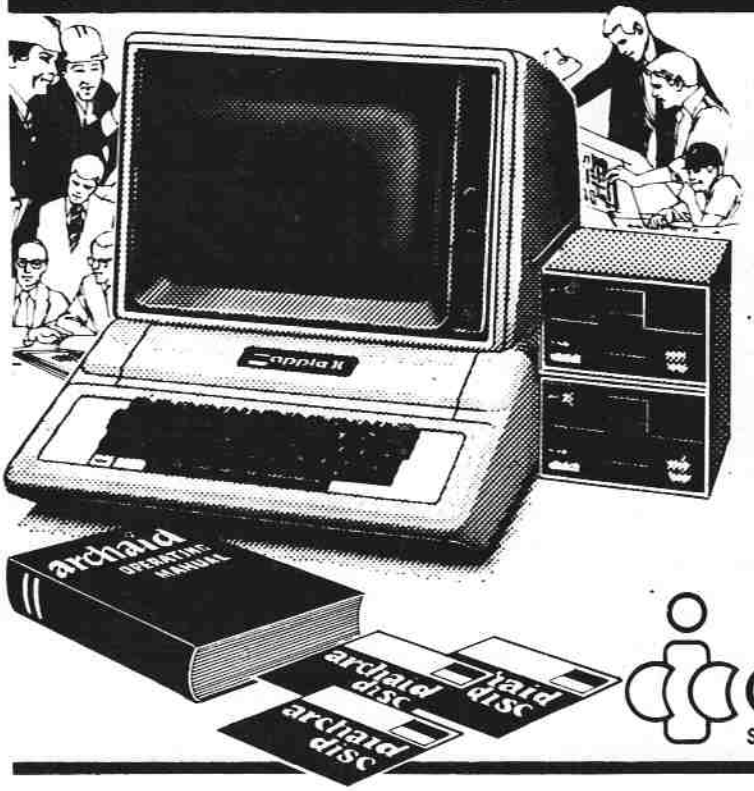
OTHER CROFTON PRODUCTS INCLUDE: Computer peripheral equipment, Frame grabber, Floppy disk drives, Floppy disks, Computer power supplies, C.C.T.V. monitors, Uncased monitors, Monitor P.C.B's., Cathode ray tubes, VHF/UHF modulators, Video switchers, Video distribution amplifiers, Camera housings, Pan and tilt units, Camera lens, Camera tubes, Printed circuit board service.

CROFTON ELECTRONICS LIMITED

35 GROSVENOR ROAD, TWICKENHAM, MIDDLESEX TW1 4AD
Telephone 01-891 1923/01-891 1513 Telex 295093 CROFTN G

archaid

The Computer Management System for Architects



It is written with you specifically in mind – and is designed to take the load of accounting and job costing off your shoulders. The system runs on the Apple micro-computer, so it's well within the price range of most architectural practices.

Will I understand it?

Yes – because no computer knowledge is required to operate the program. The computer's screen shows step-by-step instructions as a guide through all the routines.

What will it do?

- Work in progress costing.
- Cash book purchase ledger.
- Income ledger/Fee analysis.
- Payroll.
- Trial balance.
- Management reports.

How will I benefit?

- A proper system for effective control of accounts.
- Cuts down on paper work and calculation.
- Produces reports for daily job profitability assessment.
- Frees you and your staff to concentrate on important issues.

How can I find out more?

Archaid is available only from CIC London Ltd., specialists in computer software. To find out just how simple and effective the system is, contact;

CiC london ltd
software specialists

4a Russell Hill Road
Purley Surrey CR2 2XL
Tel 01-668 0683

. . . the Windfall platform for those wishing to comment on or generally discuss specific articles in Windfall. Write to: Think Tank, Windfall, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.

Counter to programming practices . .

TWO articles in the August Windfall – "More room on the disc without DOS" by N. Perkinson, and "Making the most of your software" by R. Beynon – are challenged by reader **M. Webster.** He writes:

There are several points in "More room on the disc without DOS" which run counter to programming practices that the Apple user should be encouraged to adopt, specifically:

1. Any change in the storage area available on a disc can be calculated *precisely.* Not only is "approximately 10k" unnecessarily vague, it is inaccurate. Track 0 cannot be used since DOS sets the track number on various flags that it uses to zero when it wants to indicate "No tracks selected". To force DOS to recognise 0 as a track number therefore requires considerable re-writing of DOS using a different default value. The effective increase in space for DOS 3.3 is, as a consequence, 8k precisely (2 tracks, 16 sectors with 256 bytes each). Track 0 can only be accessed by using the RWTS routine directly.

2. The program contained in the article sets up its own IOB table for the RWTS routine. There is rarely any need to do this since DOS has one ready for you to use at $B7E8 to $B7F8. Just poke in your own parameters and call it.

3. Any call to RWTS should always be followed by setting the page 0 location, $48, to zero. If not, repeated calls to the RWTS will be, among other things, irritating to the user by virtue of the beeps and drive-clatters that accompany them.

Why write a 768 byte machine code program to do something that 4 POKEs will do? From Basic try:

POKE 44723,0 : POKE 44802,234 : POKE 44803,234 : POKE 44804,234

and then initialise a disc. What this does is to tell the initialising routine to put a "track empty" image in the VTOC for tracks 0, 1 and 2, and to ignore the last phase of initialising which is to save the DOS image on these three tracks.

DOS is a tricky animal and a great deal of care is required when modifying it. The DOS manual is an inadequate basis from which to work. I would recommend any user to purchase, "Beneath Apple DOS" by Don Worth and Pieter Lechner before touching it.

Robert Beynon's article is an excellent piece of encouragement to us all to "document" our software by a "help" system rather than through vast screeds of written material. However there is one problem here. No one should be encouraged to save the screen image en bloc, i.e. memory from $400 to $7FF.

As Robert points out, DOS (and other peripherals) use 64 bytes of memory on these four pages. The most critical one appears to be $478 which DOS uses as one of the locations in which it stores the last track accessed. If there is any incompatibility between the values stored in these locations when DOS is called again, it does not do a "relative" move to the track required but an "absolute" move, i.e. the drive head is moved to the edge of the disc (clatter) and then worked back across the disc to the desired track. This process is extremely noisy and slow.

Now you use Robert's program to prepare a "help" screen and then save it (including the DOS parameters). Later, the user loads it in response to a "help" request. It is unlikely that the DOS parameters at the time when the user calls the screen will be the same as at the time when it was saved – result, a deafened user. This problem can only be overcome by writing a machine code routine to save or load a sequence of 120 bytes (three lines from the screen), omit the next 8, save the next 120 and so on through the 24 lines of the screen. This is more tedious, but good form!

Paddle scroll routine

THE article on paddle controlled character output speed ("Paddle scroll works fine with tape") in the September issue was very interesting, writes **Simon R. Edge.** However, Mr Hallam and other readers may be interested to know that DOS contains a utility for re-vectoring the input/output registers (which in a 48k system are at $AA53/4 for output as Mr Hallam states) at location $3EA. It is used by poking the patch start address into the monitor register ($36/7 for output) and then calling the routine. Hence, line 5 of the program given should be:

5 POKE 54,229: POKE 55,2: CALL 1002

This has the advantage that it will work equally well on systems with less than 48k RAM as the DOS I/O registers will be in a different place.

Other than that point, the routine is very successful, but how about being able to disable output altogether, which can easily be done by adding the following between the tenth and eleventh items in the data list (i.e. between 251 and ,200); ,192,255,240,247 and increasing the loop length by 4 (i.e. line 2 FOR I=741 TO 771). This will mean that at the maximum setting of the paddle the computer output will "hang" until the paddle is not at maximum.

N.B. *The DOS I/O routine is fully documented in the DOS 3.3 manual if anyone wants to find out more. In fact, it is used elsewhere in the same issue of Windfall! (Page 62, "How to give CTRL-C the KO").*

THINK TANK

In search of efficiency

THE Appletip giving the starting address/length of a binary file *(August Windfall, page 68)* is inefficient, in that it asks the user for memory size (which the Apple knows already) and also in that it destroys any existing Applesoft program, writes **Duncan Langford-Allen.**

I enclose listings of two programs which meet these points. The first is really intended to demonstrate the procedures, and the second to create a text file which will EXEC on an Apple II to give the desired information.

This can of course be EXER'd at any time, without altering an existing program in memory.

```
100  REM BINARY FILE ADDRESS
110  REM DUNCAN LANGFORD
120  TEXT : HOME :INC = 16384
130 MEM = ( PEEK (978) + 35) / 4
140 LOC = 43634 - (INC * (MEM < 48)) - (INC * (MEM < 32))
150  DEF  FN A(A) =  PEEK (A) +  PEEK (A + 1) * 256
160  PRINT "YOUR MEMORY SIZE IS ";MEM;"K.
170  VTAB 4: PRINT "THEREFORE THE ADDRESS OF THE LAST": PRINT "BINARY FILE
      LOADED IS
180  VTAB 7: PRINT "PEEK (";LOC;") + PEEK (";LOC + 1;") * 256
190  VTAB 10: PRINT "AND THE LENGTH IS
200  VTAB 12: PRINT "PEEK (";LOC - 18;") + PEEK (";LOC - 17;") * 256"
210  VTAB 15: PRINT "LOCATION: "; FN A(LOC)
220  VTAB 17: PRINT "LENGTH  : "; FN A(LOC - 18)


100  REM BINARY FILE ADDRESS
110  REM DUNCAN LANGFORD
120  REM WORKS ON ANY APPLE
130  REM RUN ONCE TO CREATE EXEC
140  REM THEN LOAD BFILE &
150  REM EXEC DWRITER
160  PRINT  CHR$ (4)"OPENDWRITER
170  PRINT  CHR$ (4)"WRITEDWRITER
180  PRINT "INC=16384:MEM=(PEEK(978)+35)/4:LOC=43634-(INC*(MEM(48))-(INC*(
     MEM(32))"
190  PRINT "?" CHR$ (34)"LOCATION: " CHR$ (34)"PEEK(LOC)+PEEK(LOC+1)*256"
200  PRINT "?" CHR$ (34)"LENGTH  : "; CHR$ (34);"PEEK(LOC-18)+PEEK(LOC-17)
     *256"
210  PRINT  CHR$ (4)"CLOSEDWRITER
```

VisiCalc comparisons pitfall

I REALLY enjoyed Nick Levy's article on pages 48-51 of the July Windfall, and look forward to the subsequent issues, writes **D.B. Thorogood** of Proctor and Gamble. However I believe there is an error on Page 51 where there is the discussion on the comparison between the total percentages of income and expenditure.

As they are identical to eight decimal places the example works, but if either B58 or B59 equalled 100.00000001 then the integerisation would be comparing 99.99 with 100.00 and would find the comparison false.

I think the B64 formula should be:

```
@IF((@INT(B58*1000
0+.5)/100)=(@INT(B59*10000+.
5)/100),0,@FALSE)
```

I used Nick's formula on one of my own calculation sheets and it took me nearly an hour to find why I was usually getting two or three false results out of five comparisons. Using /FG on the figures to be compared did not help as my column width was only 11 characters.

It would appear that Nick's spending pattern is similar to that of my household, except that in our case expenditure started exceeding income in March instead of April – and has continued that way ever since!

We now have about dozen keen VisiCalc users at this plant, and skills are growing at other company locations throughout the country and in Europe. Three of our Apples have been justified (i.e. paying for themselves in less than a year) on the use of the VisiCalc.

Honeywell Control Systems Limited
Citibank N.A.
Stoke Mandeville Hospital
Bradley & Foster Limited
University of Newcastle upon Tyne
Lombard Tricity Finance Limited
Sherborne School
The Civil Service Benevolent Fund
Hertfordshire Library Service
George Salter & Co Limited
Birds Eye Wall's Limited
Barclays Bank International
University of Manchester

A few well known names decided on OMNIS

All you've ever wished for in an information management system.
OMNIS sets new standards in database programs and levels of performance that you never believed were possible on a microcomputer.

- **OMNIS** is written in UCSD Pascal+ , this means a better structured, faster running set of programs than could ever be possible using Basic—We believe that UCSD Pascal+ is the best microcomputer language available—OMNIS proves it—
- **OMNIS** is structured around powerful file handling modules. These modules give you the flexibility to store and retrieve your information in the way that you want. Full multi-key indexed access is available to all your database files, you say what you want—OMNIS does the rest.
- **OMNIS** provides you with a versatile report generating module that enables you to define you own reports, lists, mailing labels etc.
- **OMNIS** has unparalleled search facilities to allow you to be selective. Those hours of fruitless searching through rows of card indexes becomes a thing of the past.
- **OMNIS** lets you design your own screen layouts for data entry and inspection—you may have up to 10 screens per file.

OMNIS has an application waiting for it in every business, school and laboratory and workshop. Wherever information needs to be stored and retrieved. OMNIS is available for both APPLE II and APPLE III. We can also supply OMNIS for use on APPLE microcomputer networks (yes, with true multi-user record locking). Trade enquiries welcome.

All registered users of OMNIS will be sent **FREE BACKUP** disc and you will be kept informed of all updates and upgrades. Free help will be given to all registered users via an OMNIS hotline.

OMNIS-All you ever wanted

APPLE II* version—£174.00 (incl VAT & pp)
APPLE III* version—£225.75 (incl VAT & pp)

The best advice you'll get.

BLYTH COMPUTERS

Use Access here | BARCLAYCARD VISA

*trademarks of APPLE Computer Inc

BLYTH COMPUTERS LIMITED
Wenhaston, Halesworth, Suffolk IP19 9DH

24 hour phone service
050 270 565

CALL in those PEEKing POKEs

By MAX PARROTT

WHEN sitting down in front of your new micro computer with a magazine filled with interesting listings there is nothing more worrying and disheartening than spotting PEEK, POKE or CALL among the keywords. The reason is not hard to discern; you don't know what they are doing unless the program author has told you, and of course, this is rarely the case.

You want to know why he is PEEKing and POKEing, what the effect is, and how did he arrive at the mysterious values he uses? This is an attempt to explain the more commonly used "numbers" which appear in Applesoft Basic listings for the Apple II Plus. Since I want to explain rather than merely list such numbers, I am going to delve into hexadecimal numbers and also give examples.

Three kinds of numbers are used by us, the users, and the microcomputer; these are binary, hexadecimal and decimal. The last of these are the everyday numbers that we humans and the Basic language use. They can be completely described by just 10 symbols: 0,1,2,3,4,5,6,7,8,9, and the position of these symbols tells us how big the number is. We all know that 1620 is bigger than 162. Now at the heart of the Apple is a microprocessor which can only do "arithmetic" on binary numbers. These can be completely described by just two symbols: 0,1. The position of these symbols also tells us how big the number is. Hence 1110 is bigger than 111.

The first thing you do when looking at these numbers is give up; they are practically unintelligible, mainly because we are not used to seeing them but also because there are so many 1s and 0s. Thus, merely for our convenience, we arrive at hexadecimal numbers which form an interface between the microprocessor's binary numbers and our (and Basic's) decimal numbers. These hexadecimal numbers can be completely described by 16 symbols: 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F. Again the position of the symbols tells us how big the number is – 120 is bigger than 12.

Wait a minute though, a problem has arisen. Because we are using the same symbols for the hexadecimal and the decimal systems we don't know which set of numbers we are looking at. The answer is easy–put another symbol together with the hexadecimal numbers so we can recognise them as such. One way is to put h or H after them, so our number is written 120H, but another more common way is to precede the number with the $ symbol – ie. $120.

So why do these numbers make life more convenient for us? Let's return to the microprocessor. It can actually add 8 (or $8) bits at a time to another 8 bits. What's a bit? Well it's a binary number – its possible value is either 1 or 0 *(sometimes written as set or reset)*. In other words, the microprocessor can take a number somewhere between 0 and 11111111 and do arithmetic with it. Again we've got an unintelligible number consisting of eight 1s in a row, so let's try to tidy it up by thinking of it as two groups of four, ie. 1111 1111. Each of these groups has the same set of symbols and it is the position which says what it is worth.

Let's simplify each group. Within the group we have a series of 1s and it is the position of each 1 which tells us the value. Temporarily let us think of these positions as decimal numbers. In each group working from left to right the decimal value represented by each bit is 8,4,2,1, thus the value of 1111 is 8+4+2+1 which is 15. Now count up the list of hexadecimal symbols given earlier and what do we find – 15 can be written as $F. Therefore our binary number 1111 1111 can be written as a hexadecimal number $FF. This is much easier to visualise and is much more compact to write, so let us use this system and not even think of binary numbers.

Arithmetic can be done with these numbers in just the same way as with decimal numbers. For example, $FF – $1 is $FE, or another example, $8 + $2 gives $A. But why bother to do this kind of arithmetic? Let's make the computer do it. Switch on the Apple and with the] prompt in front of you issue the command CALL –151 and press RETURN. The * symbol appears and you are in the monitor. Just a moment though, where did this mysterious CALL –151 come from? And furthermore, why is it a negative number?

Let's go back to the microprocessor. We know that it can do arithmetic on eight bits at a time, ie. manipulate numbers in the range $0 – $FF. But where do the numbers come from? Well they are picked from the associated memory, which is also arranged in units of eight bits, known as bytes. Therefore each unit of memory can hold a number in the range $0 – $FF. The microprocessor has to know at which byte to look for a number, and so it has an addressing system which can actually handle 16 bits ($10) at a time, or in other words a memory location can be known by a number somewhere in the range $0 to $FFFF. *(NB: eight bits give $FF and 16 bits give $FFFF as the maximum possible value).*

Each memory location can hold a number which may act as an instruction to the microprocessor or as data for it to handle. These numbers are simply whole numbers in the range $0 – $FF, but if certain rules are adhered to, they in turn can be made to represent characters such as A . . . . Z or punctuation marks, or even negative numbers. In the latter case the rules are quite simple – define a number in the range $0 – $7F to be a positive number and one in the range $80 to $FF to be a negative one where $FF is –1, $FE is –2, $FD is –3 and so on. It seems complicated, but we do need to represent negative numbers and the microprocessor only knows how to add numbers, furthermore it can only add numbers 8 bits wide.

Does this system of describing negative numbers work? Let us suppose we want to subtract 2 from 5. Well 5 is represented by $5 and –2 by $FE. If we add these two numbers together we get (in decimal) 5 + (–2) which is 3. With the hexadecimal system we get $5 + $FE. This works out to be $103, but the leftmost symbol is meaningless to the microprocessor's arithmetic because it only handles numbers up to $FF and so the answer is $3.

Let's go back to the Apple and verify this arithmetic. We are in the monitor, so type 8+2 and press RETURN. The Apple writes back =0A; enter FF–1 and it gives FE just as we said it would. Now try 5–2 and it gives 03 as expected. Now try 5+FE *(ie. the representation of –2)* and the Apple writes back 03. Great, the system works! But how did we arrive at our CALL command?

Well, memory is consecutive and can hold machine instructions or data. At the top of memory starting at $F800 and

going up to $FFFF are the machine operating instructions known as the monitor. This is composed of routines, one of which starts at address $FF69 and which lets you enter this monitor system. The Basic command to start a machine language routine is CALL followed by its starting address, in decimal, because Basic only understands decimal. If you translate $FF69 to decimal it works out to be 65385, and in fact if you return to Basic by pressing CTRL-C and then RETURN and then issue the command CALL 65385 you will be back in the monitor. Where did CALL –151 come from? Easy. Remember negative numbers can be represented by those in the range $80 to $FF – well a number such as $FF69 can also represent a negative number. $FFFF is 65535 (or –1) and $0 is also $10000 because the microprocessor can only see an address 16 bits wide. Now $10000 is 65536 and so $FF69 is also –151 in decimal. This is easier to remember and understand than 65385 and so is used, but both representations do work.

Let us try another example. Go back to Basic with CTRL-C, issue the command CALL –155. This time you enter the monitor with a beep from the speaker. Return to Basic. Now –155 turns out to be $FF65, which is equivalent to 65381, so issue the command CALL 65381 and the effect is the same. While in the monitor type FF65G, which is the monitor command to start the instructions at address $FF65. What happens when RETURN is pressed? The speaker beeps and the * returns – exactly the same effect as from Basic.

Right, we now know that the microprocessor can address a location in memory and an address is generally held in 16 bits *(ie. 2 bytes)* and can be expressed by a hexadecimal number in the range $0 – $FFFF. Because of the architecture of the microprocessor, it is faster, indeed sometimes it's the only way possible, to implement some instructions using only addresses from the first 256 locations, ie in the range $0 – $FF. These are known as zero page addresses for the simple reason that the memory can be thought of as a consecutive series of $100 bytes labelled as $0(0–FF), $1(0–FF), $2(0–FF), ... $10(0–FF), ... $FF(0–FF). In other words, there are 256 pages, each holding 256 bytes. These zero page addresses are consequently heavily used by the Apple's operating systems (ie. the monitor, the Basic interpreter and the disc operating system) and many of the POKEs you will see are concerned with these.

Sometimes one of these locations may be holding some data which the programmer wants to read (PEEK) or wants to alter (POKE), but more often than not a pair of bytes holds an address of another location which is of use to the program. This zero page pair is often known as a vector, as it points the way to another location. Thus if I wanted to keep a pointer to the start of the monitor routine, which is $FF69, in zero page memory I could set up a pair of bytes to hold the values $FF and $69. This is exactly what happens, but there is a further slight complication in that the order of the pair is reversed. In the first byte of the vector I would put $69 and in the second $FF. The part of the address held in the first byte of the pair is then often known as the low order byte and the second as the high order byte of the address.

The Applesoft manual gives many of the zero page usages on page 140. Let's look at some of them and see how they are used. A very commonly used pair is $67–$68, which is a pointer to the beginning of an Applesoft program. If you are still in the monitor and you booted up the system with a simple HELLO program these will hold the value $1 and $8 which points to $801 *(remember the reverse order).* To see these values from the monitor just type 67.68 and press RETURN. Now $67 is equivalent to 103 in decimal and $68 to 104, so return to Basic and type PRINT PEEK (103),PEEK(104). On pressing RETURN the values 1 and 8 will be printed on the screen. These, of course, are the low and high order bytes respectively of the address. To convert them to the actual decimal value of the address merely multiply the high order byte by 256 and add the low order byte, ie:

```
ADD = PEEK (103) + 256 * PEEK (104)
```

Fine, we know where the Basic program we type in will be stored, but what use is this? The answer is that the pair $67–$68 not only tells Applesoft where the program starts, but it also dictates where another Basic program will be LOADed. Hence you will often see a short loading program for another longer program which the programmer wants to place somewhere else in memory. The usual reason for this is that the high resolution graphics page runs from $2000 to $3FFF and the second high resolution page runs from $4000 to $5FFF. Thus if the main Basic program is long it runs a risk of not squeezing in between $801 (the usual start place) and $2000, the start of the graphics.

The answer is easy – move the Basic program to begin after $3FFF (or after $5FFF if both pages of high resolution graphics are required). Rather than begin the Basic program at $4000, it is much safer to begin it at $4001 (cf. $801) because the construction of Basic demands a zero value byte before and after each line of Basic and we cannot guarantee this if we start at $4000 because the value of the preceeding byte ($3FFF) will depend on what was there before and on the picture in Page 1.

Hence for a good relocating loader program we wish to put $1 into $67 *(it probably already has this value but let's make sure),* to put $40 into $68 and to put $0 into $4000. *(Incidentally many programmers forget this zero value byte and so the success of loading may be unpredictable).* The form of the Basic loading program will then be something like:

```
10  POKE 103,1: POKE 104,64: REM $1 & $40
    RESPECTIVELY
20  POKE 16384,0: REM  OUR ZERO BYTE
30  PRINT  CHR$ (4)"RUN PROGRAM 2"
```

Suppose the main Basic program was short enough to fit in the area $801 to $2000 but only just. Variables used by the program are generally stored immediately after the text, and these would then be wiped out if the high resolution page were used. Applesoft has a command to accommodate this problem, namely LOMEM: which is followed by the decimal address from which you want the variables to be stored. This is frequently 16384 ($4000).

Some programmers however, rather than use the LOMEM: command, prefer to POKE the appropriate values into the corresponding zero page locations ($69 – $6A) or they may want to know where the variables start and so they PEEK(105) and PEEK(106).

● *To be continued next month*

Loading relocatable files

I OFTEN find I wish to load and run relocatable (r) files but find either I have to alter a previous loading program or the program I have altered is on another disc. So I wrote a program which would load and run any r file.

The program pokes the name of the file into line 40 after the first quote, then adds a closing quote so the line is accepted as correct. Basic ignores colons, so a line of colons does not cause a syntax error. Altering any line before line 50 will cause the program to function incorrectly.

Malcolm Whapshott

```
10  ONERR  GOTO 80
20  GOSUB 90
30  PRINT  CHR$ (4)"BLOAD RBOOT": CALL 520
40 ADDRESS =  USR (0)"SPACE":::::::::::::::::::::::::
50  HIMEM: ADDRESS: REM  CORRECT FAULT IN RLOAD
60  CALL ADDRESS
70  GOTO 20
80  PRINT "UNABLE TO LOAD": END
90 OFFSET = 2110:COUNTER = 1: HOME : PRINT : PRINT
100  POKE (OFFSET + COUNTER),22: FOR COUNTER = 2 TO 31: POKE (OFFSET + COU
     NTER),58: NEXT : REM  POKE IN CLOSING QUOTE AND COLONS
110  PRINT "WHAT IS THE NAME OF YOUR RELOCATABLE": PRINT "FILE? (PRESS RET
     URN TO EXIT)": INPUT NAME$
120  IF NAME$ = "" THEN  HOME : END
130  IF  LEN (NAME$) > 30 THEN NAME$ =  LEFT$ (30,NAME$)
140  FOR I = 1 TO  LEN (NAME$):CHARACTER =  ASC ( MID$ (NAME$,I,1)): POKE
     (I + OFFSET),CHARACTER: NEXT : REM  POKE NAME INTO LINE
150 CHARACTER = 34: POKE ( LEN (NAME$) + 1 + OFFSET),CHARACTER: RETURN : REM
      ADD CLOSING QUOTE
```

Universal command

When developing, or transcribing, any non-trivial program, always make the first three instruction lines:

```
0 GOTO 2
1 TEXT:HOME:A=PEEK (49384):POKE 33,33:END
2 REM
```

RUN1 then becomes a universal command to clear the screen, ensure that the disc motor is off and enter a compact (i.e. no extraneous spaces) listing mode ready for cursor editing (**ESC, IJKM**).

Remember to preserve or restore the line numbers if the program is **RENUMBER**ed. Unless you are absolutely desperate for space, there is no reason to remove the instructions after program testing – no program is frozen for ever.

R.P. Brown, Wendover

```
10  REM  M.OSBORNE 1982
15  HOME
20  PRINT "FILE TYPE CODE CHANGER"
30  PRINT "INTEGER- "
40  PRINT "APPLESOFT-"
50  PRINT "BINARY-"
60  PRINT "TEXT-"
70  VTAB 2: HTAB 10: INPUT A$
80  VTAB 3: HTAB 12: INPUT B$
90  VTAB 4: HTAB 9: INPUT C$
100  VTAB 5: HTAB 7: INPUT D$
110  POKE  - 19544, ASC (A$) + 128
120  POKE  - 19543, ASC (B$) + 128
130  POKE  - 19542, ASC (C$) + 128
140  POKE  - 19545, ASC (D$) + 128
150  PRINT  CHR$ (4);"CATALOG "
```

Changing file-type codes

THE program above, by **Michael Osborne**, lets you change some of the file-type codes (not S & R).

Scientific view through Magic Window

Using the combination of Apple II, Epson MX-80F/T printer and the Magic Window word processing program for writing scientific articles, I came across the problem of underlining and also of using subscript and superscript (for example, how to write chemical formulae like 0.15M $NaH_2PO_4.2H_20$ or exponential functions – 250 x 10^9/l.

This can be achieved by controlling the line feed from within the Magic Window program by entering

(CTRL)B(ESC)A(CTRL)B X

where X is any letter of the alphabet (except M,Q,T,W). The line feed may be adjusted from 1/72in (A) to 26/72in (Z).

In order to write:

$C_6H_{12}OH$
250 x 10^9/l).
or underline

it must be entered as follows:

(CTRL)B(ESC)A(CTRL)BE C H OH
(CTRL)B(ESC)A(CTRL)BN 6 12
(CTRL)B(ESC)A(CTRL)BE 9
(CTRL)B(ESC)A(CTRL)BX 250 x 10
(CTRL)B(ESC)A(CTRL)BF or underline
(CTRL)B(ESC)A(CTRL)BR
(CTRL)B(ESC)2

(this latter command is necessary to regain original spacing whether single or double).

The main problem is that the printer does not recognise the control characters and therefore text formatting on the screen may be difficult if the control characters are on the same line as text.

One way of overcoming this problem is to format the text as desired before entering the control commands and then increasing the text width which will allow the insertion of the appropriate commands at the beginning of the line without affecting the final layout on the printer.

Roger Deacon-Smith

```
PROGRAM OUTLINE;
VAR
    INFILE,OUTFILE:STRING;
    F,G:FILE OF CHAR;

PROCEDURE STRUCTURE;
VAR
    LINE:STRING;
    COUNT:INTEGER;
BEGIN
    REPEAT
        READLN(F,LINE);
        IF (POS('begin',LINE) = 0) THEN
            WRITELN(G,LINE);
        IF (POS('procedure',LINE) <> 0 ) OR (POS('function',LINE) <> 0 ) THEN
            STRUCTURE
        ELSE IF (EOF(F)) THEN
            EXIT (STRUCTURE)
    UNTIL (POS('begin',LINE)<>0);
    WRITELN(F);
    COUNT:=1;
    REPEAT
        READLN(F,LINE);
        IF (POS('begin',LINE)<>0) OR (POS('case',LINE) <> 0) THEN
            COUNT:=COUNT+1;
        IF (POS('end',LINE)<> 0) THEN
            COUNT:=COUNT-1;
        IF (POS('external',LINE)<>0) THEN
            COUNT:=0;
        IF (EOF(F)) THEN
            EXIT (STRUCTURE)
    UNTIL (COUNT=0)
END;


BEGIN
    PAGE(OUTPUT);
    WRITELN('COPIES HEADINGS AND DECLARATIONS FROM');
    WRITELN('A PROGRAM TO THE FILE OF YOUR CHOICE.');
    WRITE('PROGRAM TO BE READ ? ');
    READLN(INFILE);
    WRITELN;
    WRITE('FILENAME FOR COPY (0 TO QUIT) ');
    READLN(OUTFILE);
    IF (OUTFILE <> '0') THEN BEGIN
        RESET (F,INFILE);
        REWRITE(G,OUTFILE);
        STRUCTURE;
        CLOSE(F);
        CLOSE(G,LOCK)
```

Quick reference guide

IF you ever need a quick reference guide to a long Pascal program, here is a short program (with no error trapping) to produce it for you. It copies, with suitable indentation, the Procedure / Function headings and declarations of your source file. It works simply by checking for certain keywords in the text, and doing a bit of counting.

The crucial keywords are given in lowercase here, and should be replaced by your preferred method of printing them. Note that the program (above) will go wrong if further copies of these keywords are embedded anywhere else in the body of the program (e.g. in the middle of variable names); in particular, it must fail if it tries to process itself.

J.P. Lewis

There appears to be a misunderstanding regarding integer versus floating point (real) variables when programming Applesoft. Most writers on programming techniques insist that integer variables take up less memory and run faster than FP variables. This is not true.

Reals take up five bytes of memory for storage, and although integers only actually require two bytes Applesoft is lazy and allocates five bytes for these as well. The placing of the % sign increases the program length.

Applesoft is a floating point Basic, and as such performs all calculation internally in floating point – whether or not integers are involved. The conversion from integer to floating point format adds about 18 per cent to the time taken to perform additions when using integer variables.

Only when using integer arrays in preference to real arrays is any storage space gained, since in this case Applesoft treats integer values properly with two bytes per value.

Nik Spicer,
Spider Software

sbd Software

MOST POPULAR SOFTWARE IN SEPTEMBER!!

Games

Choplifter – Fly your helicopter and rescue the hostages. **£19.95**

Olympic Decathelon – your chance to become a champion athlete. **£17.95**

Time Zone – The year is 4081 and the people of Mother Earth are in peril, the evil Ramadu has come to power. **£45.00**

Bandits – Your job is simple enough just guard the supplies on the lunar supply base. Sounds easy, huh? **£19.95**

Jawbreaker – the famous Pac-Man. **£17.95**

Cannonball Blitz – KONG in the arcades. **£19.95**

Swashbuckler – The hi-res sword fighting game! **£19.95**

Flight Simulator **£19.95**

Sargon II Chess **£16.95**

Wizardry **£26.00**

Business

Visicalc Utilities (Version 2) **£39.95**
Allows you to format your Visicalc data into varied management reports.

Zardax **£150.00**
One of the easiest of the 40/80 column word-processors on the market.

The General Manager **£75.00**
Fast becoming the most popular data base for the Apple II.

Merlin **£45.00**
The Macro-assembler that you have been waiting for.

Master Diagnostic Disk **£50.00**
The only way to trouble shoot problems on your Apple II.

SBD Software
15 Jocelyn Road, Richmond,
Surrey, TW9 2TJ
Telephone: 01-948 0461
Telex: 22861

We sell Apples and all Apple products. Call or write for a complete brochure.
(authorised Apple Dealer and Level 1 Services)

The Terrapin LOGO Language for the Apple II

The Terrapin LOGO language was developed by the Artificial Intelligence lab at the Massachusetts Institute of Technology.

The Terrapin Logo language is a sophisticated and powerful language that is easy for anyone to use. Although originally intended for children the language is one that advanced programmers will enjoy using too.

The Turtle graphics is also fun and easy. With simple commands you can draw in six hi-res colours and in just a few short sessions you can learn to create complex figures whether you know how to program or not.

The package contains:–
- Terrapin Logo Tutorial
- Technical Manual
- Terrapin Logo Language Disk
- Terrapin Logo Utilities Disk

The tutorial will teach you how to use Logo. The technical Manual is a reference document that contains descriptions of Logo 'primitives' (commands) with explanations of what they do, and information about assembly language interfaces for Logo and the internal workings of Logo.

After beginning in Logo, you have the TURTLE GRAPHICS, the fundamentals of Logo Music, and computation that is handling numbers, variables, procedures, recursion, exponentation, and all the graphing-functions; Sine, Cosine, Tangent, Parabola, Ellipse . . .

The Terrapin Logo Language for the Apple II **£99.00 + VAT**

NEW BOOKS!!!

Apple Graphics & Arcade Game Design **£12.50**
by Jeffrey Stanton
The only book to explain how to design arcade games from start to finish through the use of text, flow charts and working examples.

Kids & the Apple **£11.95**
by Edward H. Carlson
This book is designed to teach Applesoft BASIC to youngsters in the range from 10 to 14 years old.

Logo for Apple II **£10.50**
by Harold Abelson
Logo's designers are wishing to create an educational tool where it is possible for even young children to control the computer.

Turtle Geometry **£14.00**
by Harold Abelson & Andrea di Sessa
Turtle Geometry goes far beyond the plain geometry taught in most schools. It is also an effective use of micro-computers to change the nature of a students contact with mathematics.

Apple Pascal **£10.50**
by Arthur Luehrmann
This book is a tutorial guide to Apple Pascal. There are 14 sessions and 30-40 hours of hands-on activities.

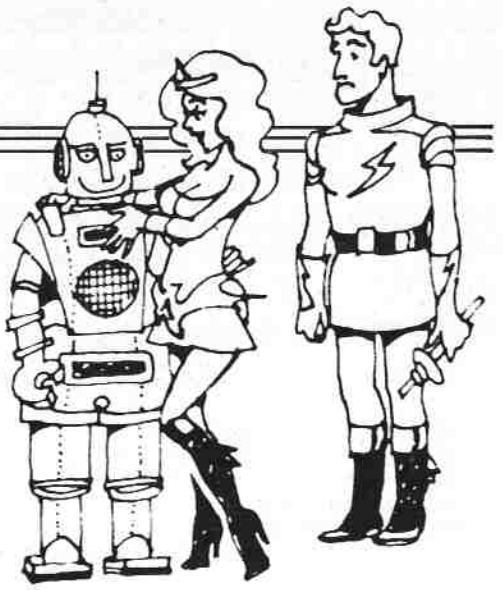
Apple II User's Guide **£11.85**
by Lon Poole
This book is your guide to the Apple computer. It covers the Apple II itself and the common peripheral devices and accessories.

Wordstar made Easy **£9.25**
by Walter Ettin
The purpose of this manual is to help you become proficient with Wordstar, which is a very flexible word processing program.

Introduction to Wordstar **£10.95**
by Arthur Naiman
If you want a good idea of what a word processing program can do, this book will give you one, using Wordstar as an example.

The Warlock of Firetop Mountain **£1.25**
by Steve Jackson & Ian Livingston
A fighting fantasy gamebook in which YOU become the hero!

All prices are plus VAT. P & P are free. We accept Visa, Access and personal cheques. Orders welcome by phone or telex.



Galactic Wars blends brawn and brain

By CLIFF McKNIGHT

BEFORE proceeding, please answer the following questions:

- Is your Apple equipped with a colour card and monitor?
- Did you enjoy playing "Battleships and Cruisers" in school?
- Do you enjoy playing Space Invaders?

If you answered yes to all these questions, then Galactic Wars from Apple Special Delivery Software may be the game for you.

According to the manual, colour is highly recommended. It's nice to see that the art of understatement is alive and well and living in Cupertino, because without colour the game is well-nigh impossible. It is even worse than watching Pot Grey! You will also need at least 32k RAM, a 16-sector disc drive (DOS 3.3), and a pair of game paddles. Oh, yes, you'll also need someone to play the game with you, because it is for two players.

The context is that two advanced alien races, the Krillians and the Centrons, have both developed and expanded to the point where they realise they cannot co-exist in the same galaxy, so a final war must be fought until one side conquers the other. *(It's funny how "advanced" civilisations always seem very aggressive, isn't it?)*

The game consists of two parts, and play involves movement back and forth between these. In the strategy phase each player has to position his base ships and fighters in the star systems that form the galaxy, an 8×14 matrix with the two players' capital cities fixed on opposite sides. For each turn, the players do this separately, not looking at their opponent's moves. An auditory prompt signals the end of the first player's move and then the end of the turn. Once each player has moved, the moves are displayed and another turn commences.

The colour coding on the screen shows who occupies each star system, but not how many base ships or fighters are in each. Hence, you know your own strength and position but only your opponent's position.

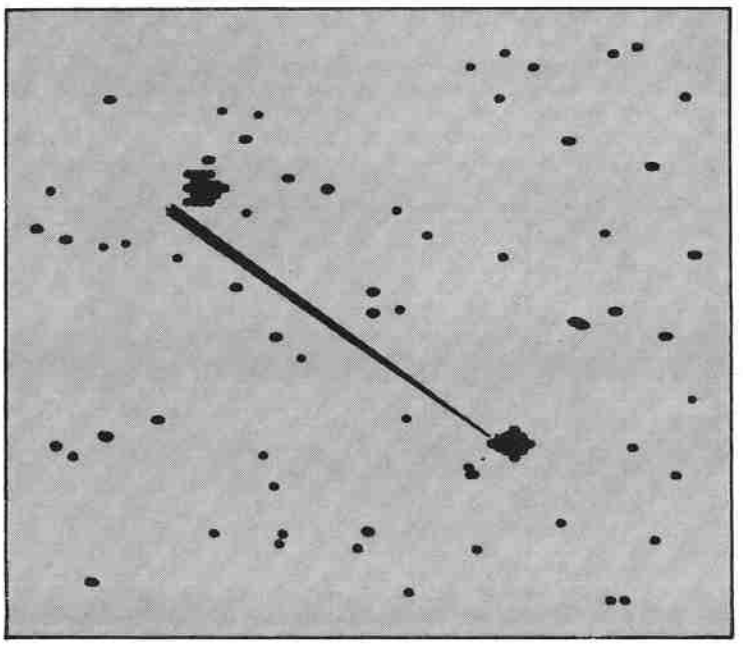
If, during a turn, both players move into the same star system, the game promptly switches to the battle phase. At this point the strengths of both players in that star system are displayed, so you know what you are up against. In the battle phase, you must move your fighter ship out of the enemy firing line while attempting to hit his ship – much frantic game-paddling and zapping and "curse you, Red Baron."

During this phase the screen wraps around so that if your fighter disappears to the left of the screen it reappears on the right shortly after, which is a good way of turning the tables on your opponent.

When one player destroys the other (or in the event of a draw), play moves back to the strategy phase and continues. The eventual aim is to storm the enemy capital and capture it, at which point you win. However, the rules governing movement are such that you can only approach your opponent's capital fairly slowly, and you have no idea until you launch your attack of the forces contained therein. A game is likely to take several hours, especially if the players are at all equally skilled, so there is a save game/restore game facility which can be used during the strategy phase.

I must say that after playing several adventure games I found Galactic Wars a welcome change, even though I have yet to win. The mixture of brain taxing strategy and wrist wrenching battle is quite refreshing, and movement back and forth means that you shouldn't get bored with either. Unfortunately, our game paddles are occasionally unreliable, so we sometimes found ourselves leaping across star systems unexpectedly or being unable to reverse the direction of our fighter in the battle phase. If you've got duff paddles too, get a new pair or learn to live with frustration.

What I found was that after an hour or so I got a sore neck from constantly turn-



Battle phase in Galactic Wars ... you lose a great deal in monochrome

Galactic Wars **£20**
Apple Special Delivery
Night Mission Pinball **£18.95**
From Spider, 98 Avondale Road, South Croydon, Surrey (tel: 01-680 0267)
Raster Blaster **£18.95**
From Pete & Pam, Waingate Lodge, Waingate Close, Rossendale BB4 7SQ (tel: 0706 227011)
David's Midnight Magic **£19.95**
From SBD, 15 Jocelyn Road, Richmond, Surrey, TW9 2TJ (tel: 01-948 0461)

ing away while my opponent (or wife, as we call them in this particular advanced civilisation) made her move. We thought of putting the monitor on a turntable and sitting either side of it, but both players need to see the screen for a battle. I could close my eyes because the program gives a double beep when each player finishes their turn, but these days I can't guarantee to open them straight away!

Apple Special Delivery Software comes in a nice packet, and a separate back-up disc is provided. The instructions for the strategy phase are not very clear on first reading so I would recommend starting a game, getting the hang of movement and then starting afresh. This isn't necessary for the battle phase because there is a training mode provided "to help you improve your fighting skills without having to play a strategic game." In other words, if you don't feel like thinking you can use the package as a pure battle game.

Incidentally, if you win don't expect fanfares and ticker-tape welcomes. All that happens is that your flag is displayed and the game is then over. As the manual says in wishing you luck: "Remember, when you become victorious, that all glory is fleeting." How true!

Down the electronic arcade..

By MAX PARROTT

LONG before there were Apples there were electro-mechanical pinball tables in all the cafés and arcades in the land. I learnt the art in the Q Caff but I grew older (not wiser), married and took to Apples in place of pintables.

While my back was turned, pintables came under processor control and moved into the electronic age, enabling ever more fancy games. But still the basic features of the game remain – two flippers, a supply of balls fired by a sprung plunger, extras dependent on score, etc, which is displayed at the back of the machine, sound effects and the tilt mechanism.

Now the ultimate, pin-table simulation on the Apple, has arrived, and being a one-time aficionado I had to try some out. I got together A2-PB1 Night Mission Pinball from SubLogic, Raster-Blaster by Bill Budge from Budgeco and David's Midnight Magic from Broderbund Software and subjected myself, the Apple, wife and kids to hours of entertainment.

I've listed the three in the order of detail which each puts into the simulation. Each presents a pintable on screen.

Night Mission and Raster Blaster show normally proportioned tables with the expected flashing lights, bumpers and flippers, while Midnight Magic has a wider than normal table with a rather atypical layout using double flippers. (The extras are half-way up the table, so there are almost two tables.)

All three games give a good simulation of the ball's motion. It is possible to catch the ball by a flipper being up, but while Raster Blaster and Midnight Magic leave the ball slightly bouncing for ever, Night Mission's ball does come to a complete rest. A little point of detail, but important when comparing three good games.

Raster Blaster and Night Mission allow more than one player – a thing I objected to on real tables but useful on the Apple, as I could prolong the game by pretending to be more than one person.

Raster Blaster and Night Mission allow different levels of play – Hard and Easy for Raster Blaster (you have to set the skill level each time you play) and 10 levels for Night Mission (which on booting, defaults to the top, or competition, level).

By invoking an adjustment menu with the latter game the easier levels of play can be selected and a host of other software adjustments made and the new mode of play can be stored on your own disc together with the high scores. There are so many adjustments possible that the game comes with a 16-page adjustment manual besides the usual "get the game running" instructions.

Midnight Magic also allows high scores to be recorded on disc, but you have to cut a notch in the boot disc, making your warranty (for what it's worth) void.

While playing a game of Night Mission or Midnight Magic the action can be frozen and resumed. Night Mission also allows the game to be played through in slow motion, which is instructive. It's nice to see how the programmer has implemented the impression of speed which generally seems greater in this version of the game.

Each "table" adjusts the sprung plunger using a paddle setting, fires the ball using a button and likewise flips a flipper. This is perfect – much better than using keyboard control.

Keys can bump the table causing a tilt, but never being one to bump much in the Q Caff I didn't do it much on the Apple. Each game seemed to treat tilting well.

Raster Blaster has one or two minor bugs in it. For example, the ball can pass through a flipper sometimes, but this is almost unnoticeable. Midnight Magic annoyed me by firing the ball through a "tunnel" so you can't see it coming.

Night Mission's love of detail extends from the very start of play. Money has to be entered (electronic coins in an electronic slot) and credit can be built up – a nice touch, missing on the others.

To sum up, I would enjoy playing any one of these games on their own but when seen together Midnight Magic is left standing. Just a few minutes play then convinces that Night Mission from SubLogic is the best buy, with Raster Blaster a reasonable second.

Quick spins

GAMES software received by Windfall include:

Crazy Mazey. *A futuristic car-chase game with 19 levels of difficulty. Drive through an intricate hi-res maze on the lookout for secret hordes of cash – but watch out for 'the killer car on your tail which is out to stop you dead.* (Datamost)

★ ★ ★

Pot 'O Gold Plus. *A clutch of 46 games with lo-res graphics and text, ranging from Acey Ducey to Tower of Hanoi. They may be simple, but they are a lot of fun and ideal for learning programming techniques. They are also designed for optional speech output on Apples fitted with the Echo II speech synthesiser.* (Rainbow Computing)

★ ★ ★

Starblaster. *A bang-bang arcade game that allows you to save Earth from an alien fighting force bent on its destruction. Your mission is to repel the waves of attackers and ultimately destroy the fearsome Annihilator. If you're lucky.* (Piccadilly Software)

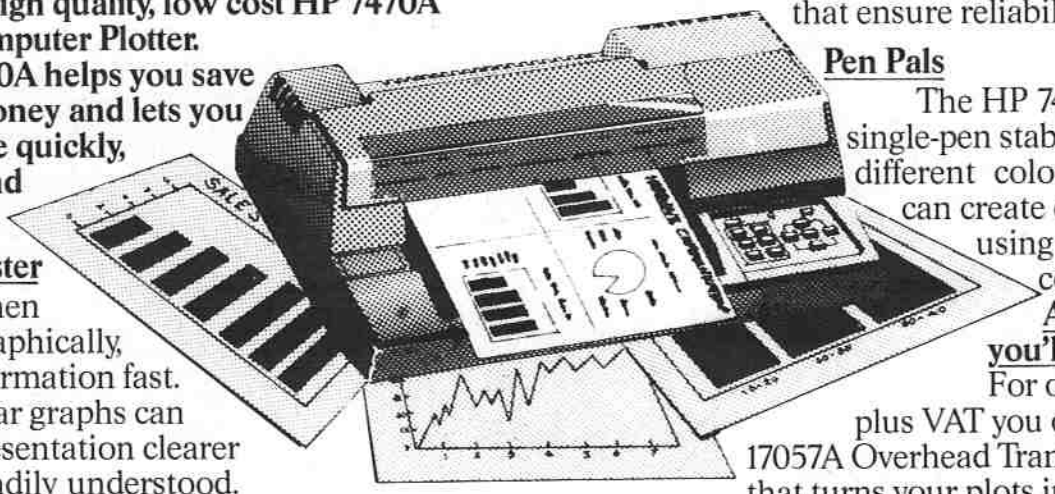
One Apple and £899 PLUS VAT can make a lot of pies...

...and charts. And graphs.

Introducing the New Personal Computer Plotter from Hewlett-Packard now obtainable at Laskys.

You can use your Apple or Commodore Pet computer to generate your own presentation charts, graphs and pie charts. How? Simply add on the new high quality, low cost HP 7470A Personal Computer Plotter.

The 7470A helps you save time, save money and lets you communicate quickly, accurately and effectively.



The eye is faster

Data, when visualized graphically, becomes information fast. Charts and bar graphs can make any presentation clearer and more readily understood. But asking your staff to produce the graphics for your next presentation doesn't ensure accuracy or artistic talent. And going to outside suppliers can be costly. Combined with your Apple® or Commodore Pet Computer, the new HP 7470A plotter does the communicating for you. Quickly. Logically. And with off-the-shelf software.

Fast and Pretty

The 7470A gives you high plotting speed with excellent line quality... faster than any competitive small plotter. On top of all that, it comes in an attractive design package that looks nice on your desk. And it does it for only £899 plus VAT.

Count on it

The 7470A is built the Hewlett-Packard Way. To last. Designed and engineered with only a few parts, none of which require adjustment.

And with customized integrated circuits that ensure reliability.

Pen Pals

The HP 7470A has two single-pen stables. Using different colour pens you can create colour plots using up to ten colours.

An option you'll want, too

For only £64.92 plus VAT you can also get a 17057A Overhead Transparency Kit that turns your plots into transparencies for overhead projectors. For "I need it tomorrow at 9.00am!" meetings, it's a necessity.

Start plotting your next presentation at Laskys

Stop in at your nearest Laskys Microcomputer Centre today and test-run the HP 7470A. Once you see it demonstrated you'll find a hundred ways to make your own Apple® or Commodore Pet presentation charts, graphs and pie charts.

Prices are correct at time of going to press. All offers subject to availability.
All credit offers are subject to acceptance.
▲ Arranged with Lombard Tricity Finance Limited on approval of application. Please ask for written details. Typical APR 34.2%.
* Normal domestic use only.

The Retail Division of the Ladbroke Group

LASKYS

14 DAY EXCHANGE ON ALL PURCHASES | UP TO £1000 INSTANT CREDIT & UP TO 3 YEARS TO PAY* | BEFORE & AFTER SALES SERVICE ON ALL PURCHASES BY OUR OWN ENGINEERS | 2 YEAR FREE GUARANTEE*

Microcomputer Departments at
LONDON & HOME COUNTIES. 471/473 OXFORD ST, W1. 01-493 4623. 7/9 QUEENSWAY W2. 01-229 6425 (Also open Sun. 12 to 6pm). 42 TOTTENHAM COURT RD., W1 01-636 0845. BROMLEY 22 Market Square. 01-464 7829. KINGSTON Eden St., 01-546 1271. LUTON 192 Arndale Centre. 0582 38302. SLOUGH Queensmere Centre. 0753 24401. WATFORD Charter Place. 0923 47488.
SOUTHERN ENGLAND. BRISTOL 16/20 Penn St., 0272 20421. MAIDSTONE 79/81 Week St., 0622 678165.
MIDLANDS & NORTH. BIRMINGHAM 19/21 Corporation St., 021-632 6303. CHESTER 7 The Forum, Northgate St., 0244 317667. LIVERPOOL 33 Dale St., 051-236 2828. MANCHESTER 12/14 St. Mary's Gate, 061-832 6087. NOTTINGHAM 1/4 Smithy Row, 0602 415150. PETERBOROUGH Queensgate Centre, 0733 313513. PRESTON 1/4 Guildhall Arcade, 0772 59264. SHEFFIELD 58 Leopold St., 0742 750971. YORK 10a Coney St., 0904 641221.
SCOTLAND. EDINBURGH 4 St. James Centre, 031-556 2914. GLASGOW 22/24 West Nile St., 041-226 3349.

LASKYS STEREOCLUB

A service provided in association with Unicredit Finance Ltd. Please ask for written details. APR 33.7%. If you pay by Bankers Order (38.5% for other methods of payment)

ACCESS | BARCLAYCARD VISA | DINERS CLUB | AMERICAN EXPRESS

TERRY THOMPSON looks at three 80 column cards currently available in the UK:
- **The Videx Videoterm – one of the earlier cards to appear; made in the US.**
- **U-Microcomputer's U-Term – a more recent British card.**
- **Zofarry's Vision-80 – originates from Australia but may be better known under the name of its US licenced manufacturer, Vista.**

WHICH 80 COLUMN CARD?

ARE you fed up with the restrictions of the Apple screen? Does it grate having to keep typing CTRL A to see the other half of Pascal or Fortran? Want Wordstar? You need an 80 column card – but which one? Will you have to modify your software? And when the advert says "compatible with Pascal and CP/M", does it mean FULLY compatible?

An 80 column card acts as a console terminal and looks like a high speed serial card to the Apple. Both CP/M and Pascal require the card to be in slot 3. Pascal also requires the card to look like a Datamedia terminal, and all the cards I've seen do this.

This emulation is reasonably difficult to achieve and most 80 column cards do not carry it out completely. In order to ease design, some use the existing, standard Apple Monitor ROM routines to perform certain screen functions. As these routines were written to send output to the standard screen, this can create conflicts with the different languages used on the Apple, as follows:

In Applesoft there can be problems with screen functions, such as HOME, HTAB, and the graphics screens. HOME may have to be replaced in your programs with an Ascii code, and HTAB replaced by POKE 36,NN where NN is a number from 0 to 79. Most cards provide upper and lower case, at the expense of FLASHing characters, while some dispense with INVERSE and FLASHing characters altogether.

Some cards provide graphic capability, but usually as an addition to the standard Apple graphics, not a replacement. In order to display the standard Apple graphics some form of extra switching is usually required. This may be manual or under software control, but all at extra cost and with extra programming required.

Because the Apple sees the card as a high speed serial card, the ability of Pascal and Fortran to look at the keyboard for their type ahead buffer and KEYPRESS functions is lost. This means that, as standard, you have to wait for Pascal to finish one operation before telling it to go on to the next, instead of being able to type in a series of commands at a fast rate, with Pascal getting them when it's ready.

With CP/M there is very little, if any, software written that makes use of the Datamedia terminal. The version of CP/M on the Apple gets round this by using an interface in the BIOS, which accepts output from the program and converts it to the Datamedia format before sending it to the terminal. As a result, normal and inverse character displays may be a lost art, and some screen functions may be missing. While this may seem a minor complaint, a lot of word processors, including WordStar, use inverse characters to display non-printing control codes. With these characters displayed in inverse, the programs become much easier to use.

The contenders:
- **VIDEOTERM**
- **U-TERM**
- **VISION-80**

I have taken these problems into account in evaluating the Videx Videoterm, the U-Term and the Vision-80 cards. All were operated with the same system – a black and white modulator to display on a *very* forgiving black and white television. Although this is a harsh way to run the cards, and not recommended by any of the manufacturers, all performed admirably, producing crystal clear characters in both upper and lower case, and, where applicable, inverse display.

Videoterm

By usual 80 column standards, the Videoterm card is small, only 7¼in long, and appears well made, with all ICs socketed. It has its own clock and is the only 80 column card tested that can be plugged into any of the Apple's slots. However, as both Pascal and CP/M require the card to be in slot 3, you might as well put it there and have done with it.

At the front of the card is a five pin Molex type connector. The top four pins have the same signals out as the four pin auxiliary video connector at the back of the Apple motherboard. This connector carries the video output from the card via a matching Molex female plug and a short length of coax terminating in a female phono plug, the cable being supplied with the card.

The fifth pin is reputedly available for use with a light pen. However, no light pen is supplied and the only references to this pin are a passing comment in the manual introduction and on the circuit diagram. There is no other documentation at all on the subject, which suggests that the light pen facility doesn't exist.

The card comes with a 130 page, easily read manual that contains almost everything you will ever need to know about the card's operation and firmware (pin no. 5 excepted.) Included in the documentation are a number of fixes for different problems that may arise with your system. The manual also contains a full listing of the firmware driver routines for the assembly language programmer, a description of the hardware and its operation.

The Videoterm's display is pleasant and easily read. It has both upper and lower case with true descenders in lower case, the case being changed by typing CTRL-A. This case change operates as a soft switch and, as there is no shift key facility,

takes a bit of getting used to. Once mastered though, it becomes second nature.

Two character fonts can be resident on the card at the same time. The alternative set can, if required, be a set of block graphics characters for the display of graphics on an 80 column screen. The fonts are contained in EPROMs and may be programmed by the user or bought preprogrammed at extra expense. Switching between fonts is achieved simply by means of control characters.

The firmware supplied does have some drawbacks. INVERSE and FLASHing characters are not supported. There is no change to the display on receipt of these commands, but the user's programs may have to be modified as the card neither supports any of the standard screen or graphics commands, except VTAB and TAB, nor CALLs to monitor screen handling routines. Instead, the commands have to be replaced with an Ascii code or codes or POKE statement, and all graphics have to be displayed by the standard Apple display. As there is no automatic on-board video switching, a second video screen, or some alternate means of video switching, is required – all at extra expense.

Pascal and Fortran automatically turn the video card on at boot. Listed at the beginning of the manual are two fixes that enable the type ahead buffer and KEYPASS functions to be returned. CP/M also turns on the card, but does not require modification. However as in Basic, the same problems with the graphics display apply to all of these languages.

Accessories are available at extra cost, including hardware and software controlled video switches, and alternative character sets in EPROMs, but not, apparently, the little documented light pen.

U-Term

This is a long – 10in – card, but it has a bevelled front edge so that the Apple's lid can be closed. Again, it appears well made, with all ICs socketed. It has no on-board clock. Instead it gets its clocks from the main Apple board by replacing an IC on the motherboard with a small circuit board onto which fits the replaced IC. This board is then connected to the U-Term card by a ribbon cable. Output from the 80 column card is by means of a short hardwired length of coax cable terminating in a female phono socket.

Also included in the package is a second link that connects between the games paddle socket and the keyboard encoder beneath the keyboard. This allows the keyboard shift keys to function as proper shift keys, following an initial control key sequence. The installation of the card and its accessories is quite complicated, but the fitting instructions are comprehensive. They include a photograph and should be clearly understood by even the most inexperienced.

Unfortunately the card's installation is the only section of usage that is adequately documented, taking up half of the total 20 pages. With such an intricate subject aimed at all sections of the Apple market such brief documentation is a major failing.

Operation of the terminal, once mastered without a manual, is reasonably easy, with a pleasant display in both upper and lower case. Lower case has true descenders and is easily read. In order to initiate lower case a short two key control sequence is typed. From then on upper case is available via the shift keys as with a normal typewriter. A second two key control sequence is used to return to upper case only.

Two different character fonts may be resident at the same time. Apparently the second is resident in RAM, and a character generator program is supplied on disc with the package. However, due to the scant documentation, I was unable to get this option running.

In Applesoft Basic the INVERSE display is retained but in order to fit lower case into the Ascii code FLASHing characters have been dispensed with. Whenever the command FLASH is received characters are displayed in inverse. Almost all other screen-based functions and CALLs must be replaced with Ascii codes or POKEs, so that – as with the Videoterm – alterations to existing software will be needed. No onboard video switching is supplied either, so some form of external switching is needed with the card.

As mentioned, the Pascal and Fortran languages lose their type ahead buffers and I was unable, even after a telephone call to the manufacturers, to establish a fix to recover these functions.

With CP/M the INVERSE character display function is lost. Without a disassembly of the driving routines it is difficult to say exactly why, but it appears that the card uses the standard monitor routine for this function, which doesn't transfer to CP/M. Because of the lack of documentation assembly language programmers will have to work out the driver routines themselves.

All languages require some form of video switching in order to display graphics. U-Microcomputers offer a hardware video switch for this purpose, but, as with the Videoterm, at extra expense.

Vision-80

Having resigned myself to extensively altering *all* my unprotected software where possible, and having to keep flicking a switch to find the protected software or graphics, I plugged in the Vision-80.

It's another long card, the same size as the U-Term. Again, it appears well made, but only the two EPROMs and the main controller chip are socketed. Even given the reliability of ICs, it only takes one mistake to blow a chip, and if it is soldered into the board it can be a devil to replace.

The card carries its own clock and is simple to fit. There are two video connections. The first is plugged into the video output at the rear of the Apple case to take the standard displays. The second carries all the video output from the card and is plugged into the monitor or modulator. Vision-80 has the same type of shift key modification as the U-Term, except that it has a socket in the top. This enables the games port to be used for other things without having to remove the link. An LED is also connected to the games port by this link.

When installed this modification converts the shift keys to full operation. In addition if either shift key is pressed and released on its own the case mode is changed, that is, either full upper and lower case, with the shift keys working as they should, or all upper case, using the shift keys to access special characters. Whenever a case change is made the bell is sounded and the LED changes its state, giving a visual display of the current case.

The card does its own video switching between six different screen formats, and without much, if any, interference from the operator. When the system is booted the card starts at the standard Apple text screen and, except for switching between 40 and 80 columns in Basic, switches in whichever display is required. If you need the hi-res display, then there it is – the screen is displayed automatically. The only time the card needs to be told to change screens is when changing from 80 columns to another format and vice

→

versa. Even then it's only a two character string sent to the terminal.

The 50 page manual gives a full explanation of all Vision-80 facilities. Although there is no disassembly of the driver routines, all entry points that might be needed by the assembly language programmer are fully documented. The UK distributors assure me that bona fide OEM dealers will be given the ROM listings on request.

The display is good in upper case and excellent in lower case. In fact it is so good that it seems a shame to call it lower case – flowing script is much more appropriate. The only unusual feature of the display is the rate of screen scroll. I haven't timed it, but it seems 20 per cent slower than standard, and is reminiscent of the DOS Toolkit hi-res character generator. After a little use, it becomes unnoticable.

In Basic all screen-oriented commands and functions, such as HOME, HTAB, HGR, etc, are fully supported. CALLs to monitor screen-handling routines are not, and must be replaced by Ascii codes which will perform the same functions. While this may necessitate some changes to programs the facility puts the card ahead of competitors.

Pascal and Fortran switch 80 columns on automatically, and there is a fix supplied on disc that returns the type ahead buffer and KEYPRESS functions. In addition, the card gives both languages the extra ability of displaying inverse characters. It is the only one of the cards tested that displays inverse characters with CP/M, and to see Wordstar in all its glory on an Apple is a joy. As with Pascal, GBasic needs to send a two character string to the terminal in order to change to the graphics screens.

No optional extras are listed for this package, but then none are really needed. If you need a different character set there is a character generator on the demonstration disc supplied. These fonts will have to be blown onto an EPROM, but the card can accept a wide variety of EPROMs. Comprehensive instructions regarding which EPROMs to put where are given in the manual.

With such a complete terminal I would have thought the Vision-80 ended there. It doesn't though. The icing on the cake is a set of communications routines in firmware. They are very comprehensive, and would easily replace what I've seen of Visi-Term, Ascii Express, and Z-Term. The routines are used to communicate with mainframes and minis as well as other Apples and, possibly, Prestel. In addition, if the other Apple is also equipped with a Vision-80 card one Apple can take control of the second's processing – a very handy facility.

For this firmware to work a serial card, which must comply with the Apple communications protocols, is needed in slot 2. Then your Apple can operate as a terminal in any of the above modes. There is a whole host of control codes with which you can, among other things, get half or full duplex transmission, the number of start and stop bits, odd, even or no parity, downloading and uploading data to and from disc printer or remote computer.

Conclusions

Videoterm *is now beginning to get a little long in the tooth. Its display is perfectly acceptable, but the method of shifting case would not suit even the slowest typist. Without INVERSE characters, displays become mundane, and a dense display could be difficult to read. In addition, extensive changes to existing software will almost certainly be needed and some form of video switching is a must.*

On the plus side, documentation is very good and there appears to be good support for the card. It has been accepted by MicroPro for installation with their Wordstar system, and a new program which allows VisiCalc to display in 80 columns should breath some fresh air into the card. What VisiCalc looks like without inverse characters has yet to be seen, though.

The card is slot independent and could be used as a third display terminal, with a second in slot three. As regards cost, taken with the options of a font editor and software controlled video switch, the system is not cheap at £270.

As with the Videoterm, the **U-Term's** *display is perfectly acceptable, but again, to take advantage of the enhanced display your software will need extensive changes as well as needing a video switch. Documentation is very poor, and there seems little support for the card.*

On the plus side this card does have INVERSE display with Applesoft, and the shift keys work. Unfortunately, Pascal and Fortran suffer the loss of functions. The fact that the card is slot dependent does not detract from its performance, which on the whole is good.

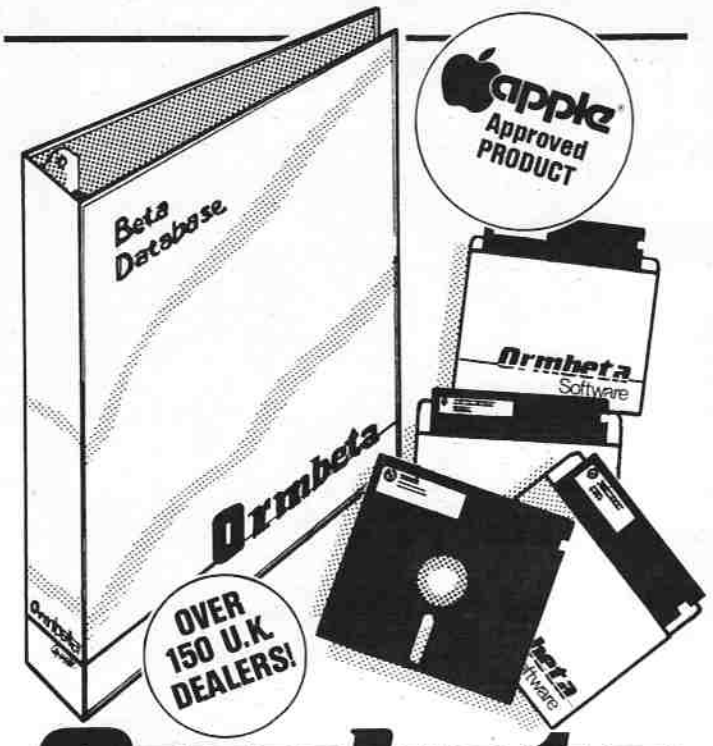
U-Term is the cheapest of the three and comes complete with a font editor on disc. Cost with the same accessories as the Videoterm is £200 and at that price, it is ideal for the hobbyist or low cost system.

In complete contrast, **Vision-80** *has onboard video switching, the shift keys work and you don't need to keep unplugging the link. It supports all Basic screen-oriented statements and has INVERSE character display in all programming environments. This means that little, if any, software changes are needed. A font editor is supplied on disc for those unhappy with the standard font. With such a beautiful display however I can't see this getting too much use.*

To cap it all, the card has £50 worth of communications software aboard. You may not have a need for this right now, but who knows what might happen to communications in the near future. As it uses standard protocols, any new facilities for the Apple will be immediately available.

Support for this card is growing. The lastest release of Wordstar will install it, and there is now a version of the software that allows VisiCalc to display in 80 columns with all INVERSE prompts displayed correctly. The card costs £225.

Vision-80 is a beautiful piece of hardware. it seems to do just about everything automatically, except brew the tea, with a minimum amount of fuss and changes to software. Any user would be hard pressed to find a better 80 column terminal for his Apple.



Ormbeta
MEANS BUSINESS....

'Ormbeta' is the most powerful and versatile Database system currently on the U.K. market – and that's a fact! It's written in PASCAL... the language of the future for business and scientific applications, and the specially developed 'P' operating system enables it to be used with virtually any popular Microcomputer hardware.
'Ormbeta' is already available on Apple – IBM – Xerox – Osborne – Sirius, Victor and Sage. It is an Apple-approved product, and they have recently installed the new Beta 'Turbo' system at their European head-quarters – what better recommendation is there!

....SOFTWARE!

A typical 'Ormbeta' package comprises Beta Database, Sales/Purchase/Nominal Ledgers, Payroll and Stock Control. Further exclusive packages have been developed for Estate Agents, Catering Management, Club Membership and Golf Handicapping.
'Ormbeta' is constantly being updated and improved to meet today's ever-changing business climate. To find **your** ideal system, contact us for advice on your nearest dealer.

Please send me further details and advise me of my nearest dealer.

My computer is _____

Name _____

Organisation _____

Address _____

_____

_____ **Tel.** _____

WF 11.82

ORMSKIRK COMPUTER SERVICES LTD.
Wheatsheaf Walk, Burscough Street, Ormskirk,
Lancashire L39 2XA
Tel: Ormskirk (0695) 77043 Telex: 627110 & 628702
CHACOM G Prefix 'ORMBETA'
Access & Barclaycard welcome

S.B.D. Software is proud to announce their distribution agreement with the most up to date APPLE-only magazine in America.

CALL A.P.P.L.E. MAGAZINE

In today's fast changing world of the APPLE you just can't afford to stay behind, so don't settle for anything less than the best APPLE-only magazine in America.

Now you can purchase this outstanding magazine for the low price of £1.75 per issue.

Your subscription for 12 or 24 magazines may start from any month in 1981.

Single back issues are available at £2.25 per issue including postage and packing.

A bound volume of the issues in 1980, 1979, 1978 are available for £20.00, £15.00 and £10.00 respectively, including postage and packaging. (Please note that in 1980 & 1981 there were only 9 issues published but in 1982 there will be 12 issues.)

☐ 12 issues @ £21.00 ☐ 24 issues @ £40.00

Europe Air Mail postage, add £6 per 12 issues

NAME .....

ADDRESS .....

TOWN ..... POSTCODE .....

Please start my subscription ..... Month ..... Year

..... Expiry Date

Barclaycard/Access Number

Please make cheques payable to CALL APPLE (UK)

Send to:- CALL APPLE (UK), c/o SBD Software,
FREEPOST, RICHMOND, SURREY TW9 1BR
(No postage stamp required)
Telephone: 01-940 5194

The Famous Book
"ALL ABOUT APPLESOFT"
Now available @ £9.50 incl. P. & P.

---

superVision

Can you work without it ?

The **DIGITEK** card plugs directly into slot 0 - no chips to remove - no utilities to run - and **VISICALC** automatically expands by 16K, giving a model size with version 3.3 of 34K. The **KEYPLUS** keypad has left and right arrow keys, together with 'escape' and space, as well as the numbers.

For the serious **VISICALC** user, an offer that's hard to refuse. Increase your model size and speed your entry rate. We've packaged together the **DIGITEK 16K RAM** card and the **AIDS KEYPLUS** numeric keypad - saving you **£50** on R.R.P.

number one computers

francis street, st. helier, jersey. tel.(0534) 77268
ACCESS AND VISA CARDS WELCOME

Work with **superVISION** for only **£161.60** plus **£1.90** postage and packing.

Send your remittance for **£163.50** to

village computer services

WORD PROCESSORS

Screen Writer II	£75.00
Super-Text II	£85.00
Videx/Applewriter II Boot Disk	£15.00
Applewriter II	£75.00
Letter Perfect	£100.00
Dan Paymar LCA2	£39.00
Zardax	£150.00
Wordstar	£145.00
Mailmerge	£65.00
Pie Writer	£87.00

BUSINESS/UTILITIES

Visischedule	£195.00
Ormbeta Database	£195.00
Videx/VisiCalc 80 Column Disk	£35.00
VisiCalc	£120.00
Visidex	£120.00
Visifile	£140.00
Visiterm	£78.00
Visiplot/Visitrend	£140.00
D.B. Master	£125.00
D.B. Master Utility	£62.00
Data Factory	£98.00
Ramex 16K Card	£75.00
32K Saturn Ram Card	£130.00
Locksmith 4.1	£65.00
The Inspector	£35.00
Expediter II	£75.00
Zoom Grafix	£24.95
U-Z80 Card	£85.00
Master Diagnostics	£45.00
Tasc Compiler	£100.00
Videx Videoterm	£180.00
Dos 3.3 Toolkit	£40.00
MatheMagic	£55.00
T G Joystick	£33.00
Super Disk Copy III	£20.00
Visischedule	£190.00
Versaform	£210.00
Systematics International Ledger Systems	P.O.A.
Vlasak 'Orbit' Ledger Systems	P.O.A.

GAMES

Choplifter	£18.00
Bug Attack	£14.95
Wizardry I	£26.00
Wizardry 2 (needs 1)	£22.00
Time Zone	£54.00
Wizard & Princess	£17.50
Zork II	£22.00
Raster Blaster	£16.00
Flight Simulator	£21.00
Apple Panic	£15.50
Kabul Spy	£19.00
Epoch	£19.00
Hadron	£19.00
Beer Run	£15.50
The Prisoner	£15.50
Castle Wolfenstein	£15.20
Pursuit of the Graf Spee	£31.00
Snack Attack	£15.50
Sargon II	£20.00

Postage and packing FREE – please add 15% VAT to your order.

We stock the full range of Apple related books.

Firebird	£15.20
Olympic Decathlon	£15.50
Tawala's Last Redoubt	£15.50
Sneakers	£17.00
Russki Duck	£18.00
Pegasus II	£14.95
Tigers in the Snow	£22.00
Threshold	£20.00
OO-Topos	£15.50
Genetic Drift	£15.50
Horizons V	£19.00
Adventure to Atlantis	£24.00
Soft Porn Adventure	£16.50
Escape From Rungistan	£17.00
Cannonball Blitz	£17.00
Fly Wars	£16.50
Jelly Fish	£18.00
Mouskattack	£18.00
Micro Wave	£19.00
Bandits	£20.00
Minotaur	£19.50
Cyclod	£18.00

MONITORS

Philips 12" Amber Monitor	£130.00
BMC 12" Green Monitor	£120.00
Zenith 12" Green Monitor	£105.00

PRINTERS

IDS Prism 80	£650.00
IDS Prism 132	£840.00
Epson MX80 III FT	£350.00
Epson MX100 FT	£450.00
Olivetti ET121	£730.00
Centronics	P.O.A.
Plus Interface Cards and Buffer Cards	
Oki	P.O.A.

This is just a small sample of what we have in stock – please ring or write for price list and further details. We also sell Apple II carrying/flight case.

We are Consultants for small businesses.

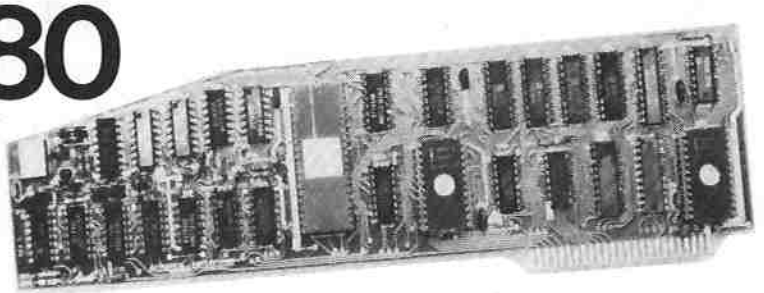
Dealer enquiries welcome

6 Pavilion Parade, Wood Lane, London W12 0HQ. Tel: (01)-743 9000

VISA

VISION-80

80 column card for Apple II Computer
R.R.P. **£195** + VAT



The Vision-80 has achieved world renowned success with the major magazines rating it superior to all its competitors. It features a superb 9 x 11 dot character set with 3 dot descenders, and no mechanical switches are needed. Unlike other 80-column cards, the Vision-80 fully supports the Applesoft commands HOME, GR, HGR, HGR2, TEXT, TAB, VTAB, HTAB, INVERSE, NORMAL, and the text window is fully supported to Apple's conventions. In Pascal and CP/M, HIGHLIGHT, LOWLIGHT, FLUSH, function KEYPRESS, and the type ahead buffer are all supported. In addition, the VISION-80 works with all languages available for Apple II and such software products as APPLEWRITER II, LETTER PERFECT, EASYWRITER, ZARDAX, SANDY'S and WORDSTAR (CP/M) word processors, and it also has a unique and powerful communications facility present in hardware on the board ... **RRP £195 + VAT**

80-COLUMN VISICALC
VISION-80 VC. This is a utility that works with all versions of VISICALC 3.3 to provide a full 80 column display using the VISION-80. Data can be entered and displayed in upper and lower case. You can even set the column width to 77 characters and use Visicalc as a W.P.! Flashing characters are displayed and the inverse video capability lets the user know where the cursor is at all times. Compare all these features with the competition, and then come and buy the best! ...**RRP £29.50 + VAT**

80-COLUMN APPLEWRITER II
VISION-80 AWII. This utility allows Apple Writer II to run with the Vision-80. All features of Apple's Word processor are supported, the only enhancement being an inverse top line display, similar to the 40 column version. The resultant display is better than an Apple III running Applewriter ... **RRP £15 + VAT**

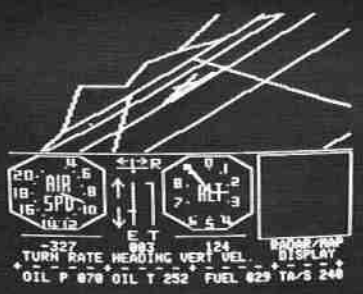
Also available – Preboot disc for Easywriter.
COMING SOON ... VISION-80 VC EXPANDER, a development of VISION-80 VC that allows the use of 128K RAM Cards.

PYNWON COMPUTER SERVICES HOLDS WORLD-WIDE DISTRIBUTION RIGHTS TO THE ABOVE SOFTWARE. DEALER AND OVERSEAS DISTRIBUTOR ENQUIRIES INVITED.

Distributor in UK:
PYNWON COMPUTER SERVICES
Laurie and Elizabeth Boshell, 17 Watermill Lane, Edmonton, London N18 1SU. (01) 884 0879

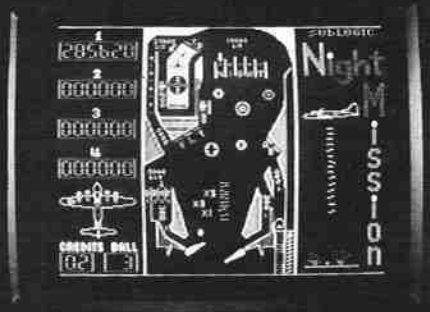
Rated No. 1 by Byte, Softalk, Your Computer and Call A.P.P.L.E. and highly rated by Windfall.

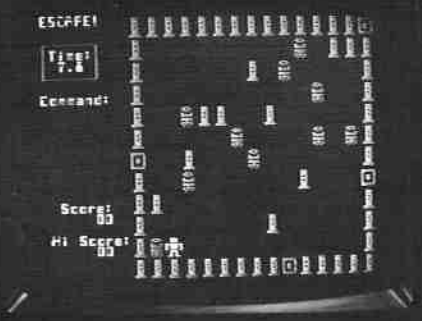
Introducing . . .
the SubLOGIC line of quality software for your Apple II



A2-FS1
FLIGHT SIMULATOR – Combines superior flight simulation with the best animated 3D graphics available. Practice take-offs and landings, other aerial maneuvers, declare war on the enemy. 16K cassette, 32K disk.

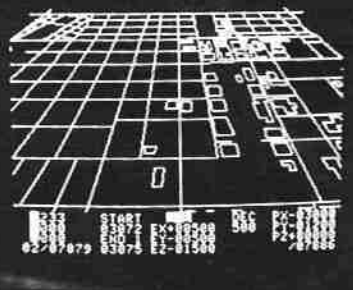
A2-PB1
PINBALL – The ultimate arcade simulation program, an exciting pinball game with the ball and flipper precision to make increased skill pay off. Includes 10 different play modes and 100 user-adjustable modes. 48K disk.

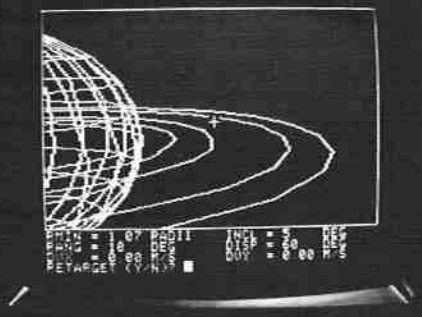




A2-SG1
ESCAPE! – A challenging game of skill and strategy. You've broken out of your cell and now the electronic guards are closing in fast. Can you escape? DOS 3.3 Applesoft 48K disk.

A2-3D1
GRAPHICS FAMILY – State-of-the-art 3D graphics. Define 2D or 3D wire-frame objects in any size and orientation, view them from any perspective. Offers variable field of view, color or hi-res (280 x 192) line generation, object instance nesting, and independent object manipulation. **Graphics Editor** lets you add 3D text to your scene, superimpose 2D text labels in upper- or lower-case, and record your entire presentation for playback. A BASIC interface is included to aid in the development of your own control programs. DOS 3.3 48K 3 disks.



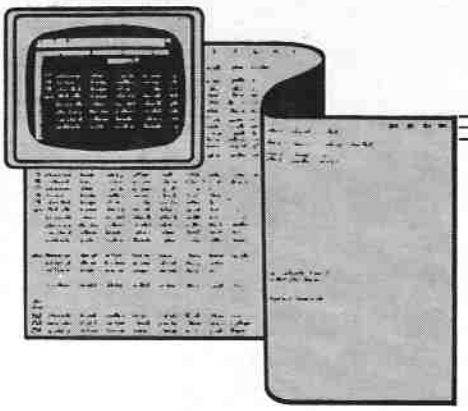


A2-2DA
SATURN NAVIGATOR – A hi-res 3D adventure simulation of a space flight from earth to Saturn. Maneuver your ship into orbit around the ringed planet, rendezvous with the Saturn space station. Available as a complete package or as an adjunct to the A2-3D1 graphics package. Applesoft 48K disk.

subLOGIC

See them today at your dealer . . .
or contact SubLOGIC for further information.

Communications Corp.
713 Edgebrook Drive
Champaign IL 61820 USA
(217) 359-8482
Telex: 206995



First step for CBEs: Brush up your algebra

By NICK LEVY
Principal,
Interface Management

THE CBE stands for the Celebrated Business Executive, and in this article we shall deal with some of the problems actually faced by a CBE who tried to develop a functional business model using VisiCalc (or for that matter SuperCalc or similar types of electronic spreadsheets).

Our CBE did not get to where he is today by being shy and bashful, so he did not feel apprehensive sitting by a computer and using the teletype keyboard for the first time in his life. Learning new skills was a not a difficult task for a man of his calibre and talents, and within a few hours he became versed in the use of the various VisiCalc commands and functions.

But it was only after having mastered the VisiCalc program that our CBE made his first really big discovery, which rather dismayed him. He found out something about using VisiCalc which nobody had told him before. He discovered that in order to take full advantage of its capabilities one really has to know one's algebra. And that without a working knowledge of algebra one will only be able to develop business models which have limited practical applications.

It all happened when our CBE sat down with a microcomputer and a yearning desire to develop for his business a financial model for budgeting and cash flow. His ultimate objective was to have a model which could be used to instantly test various "what-if" situations. Part of the working of the model required calculating wages based on the formula:

```
((D16*(D17+D18))+((D26*(D27+
D28))+((D36*(D37+D38)),
```

This, our CBE admits, was actually one of the simpler formulae in his model. A little later he found out that the problem of making sure that you know your algebra and that you know exactly where to put your brackets becomes more critical when your formulae start to look like this:

```
(((K54+K56)*.25)+((M54+M55)+
@SUM(P56...P70)))*1.5,
```

Fortunately if you miss out half a bracket in the above formula you'll get the ERROR message so you can correct your mistake. But what is worse is if you drop a pair of brackets, then you can easily get the wrong answer inadvertently, which in turn could render all your subsequent calculations incorrect!

At this point I am sorry to say, our CBE came to a rather sad conclusion: "Having to feed in the correct formula", he claimed, "is the great drawback of the VisiCalc type of spreadsheet". This comment reminded me of the big-headed child who blamed his paper and pencil for failing the spelling test. But we have to admire our CBE, he did not get to where he is today by being arrogant and afraid to ask questions *(in order to cover up his ignorance),* so he had no hesitation in calling in a financial planning consultant to help him out with the algebra.

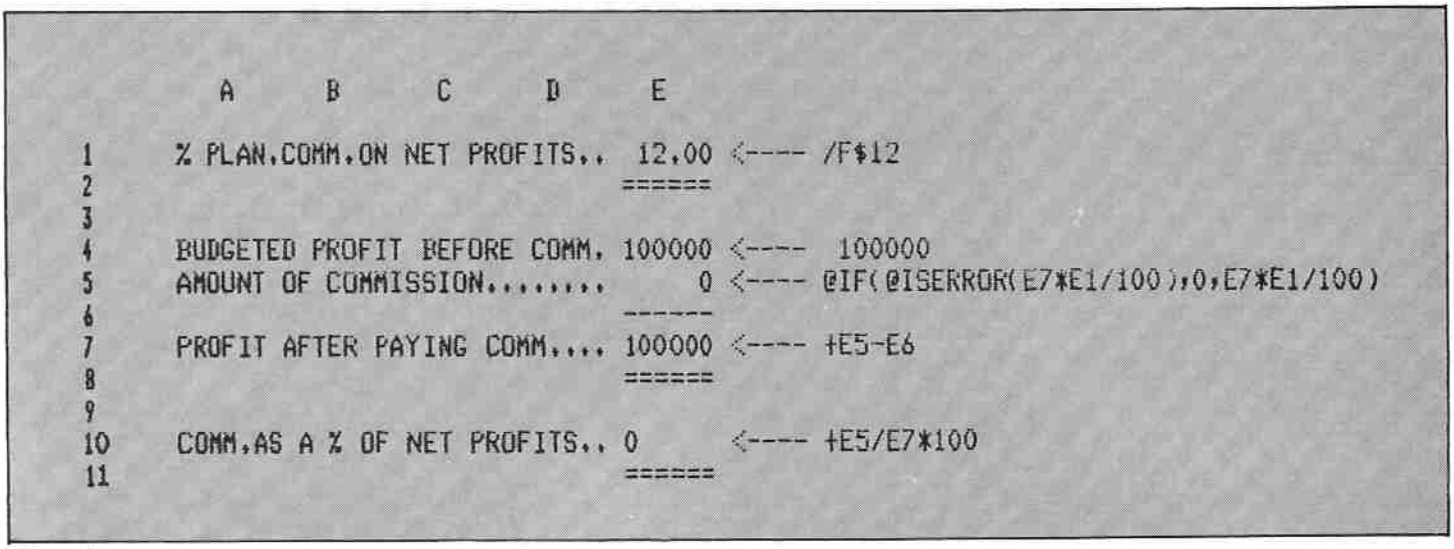
Let's face it all you aspiring CBEs: Real life business modelling is nothing like any of the simplistic business models we are used to seeing when VisiCalc is demonstrated to us. Creating real business models is like decorating a large hall – you need to do a lot of planning and preparation. Without prior planning and preparation your business models will look like a cracked wall splashed with paint. So in spite of what the promotional material and the advertisements about VisiCalc say, don't throw away your paper and pencil, use it to develop a logical framework for your VisiCalc model before you start entering your business model on the screen. This is not just my advice, this is actually a recommendation made by the creators of VisiCalc themselves.

Your model will only be as good as the logical framework that you have developed for the business that you want to model. And the logical framework for your business models will only be as good as your practical knowledge of algebra. So if your knowledge of mathematics is confined to arithmetic and only a vague idea of algebra, then you will not be able to use VisiCalc to solve intricate business problems, which inevitably require a great deal of hard thinking. Fortunately the level of algebra required for using VisiCalc is elementary, although the formulae themselves may appear intricate and formidable.

Now if you think that you can make up for your lack of knowledge of algebra by turning to one or other of the more sophisticated financial planning programs patterned after time sharing systems, then you had better think again. For you will never become a CBE if you entrust any computer program with the task of developing a logical framework for your business models. This is something that should be undertaken only by you and your management team. No two businesses, however similar, can be regarded as identical, which is why developing the logical framework for your business is not a task to be delegated to a ready made computer program.

The next discovery made by our CBE not only came to him as a greater shock but also left him in complete disarray. He discovered that business models are made up of open looped and close looped financial modules. Before going any further let me first explain what is meant and what is the difference between an open looped and a close looped financial module.

If, for example, a company's budget for paying its sales force is made up of 1.2 per cent of the annual turnover (say 1.2 per cent of £1,000,000) plus a fixed sum then the calculations are straightforward



```
        A       B       C       D       E

1       % PLAN.COMM.ON NET PROFITS..   12.00 <---- /F$12
2                                      ======
3
4       BUDGETED PROFIT BEFORE COMM. 100000 <----  100000
5       AMOUNT OF COMMISSION.........      0 <---- @IF(@ISERROR(E7*E1/100),0,E7*E1/100)
6                                      ------
7       PROFIT AFTER PAYING COMM.... 100000 <---- +E5-E6
8                                      ======
9
10      COMM.AS A % OF NET PROFITS..  0      <---- +E5/E7*100
11                                     ======
```

Figure 1

and can be described as an open loop type module.

If on the other hand the budget is made up of 12 per cent of the annual profits, plus a fixed sum then we are faced with a problem: As the company pays its sales force 12 per cent of the profit (e.g. 12 per cent of £100,000 = £12,000). And as the £100,000 profit is the profit before making the commission payment, then the £12,000 commission will represent more than 12 per cent of the company's final profit calculated after making commission payments (i.e. £88,000). So we are faced here with a closed looped module, where two figures are mutually dependant on each other.

Fortunately, as we are going to see, VisiCalc was tailor made and can be easily used for solving such closed looped problems – and you do not need any special knowledge of algebra to do this. However the bad news is that our CBE was afraid that all this looping could get him into a whirl, so with a little bit of permissable cheating he cut a few corners which enabled him to move to the next stage of the development of his business model.

Let us pause here for a moment and see how VisiCalc deals with closed looped modules. The effects of making circular references (Pages 2-24 in the VisiCalc manual) could be disastrous if entered unintentionally, but in the right hands this facility can be used as a practical tool for making calculations involving close looped modules.

Use your VisiCalc program to set up the model shown in Fig 1, starting with the following two global commands: /GC7 Return and /GFI.

Perhaps you are wondering why was it necessary to have such a long formula in cell E6? Why not just enter E7*E1 ? The reason for this is because if you just enter E7*E1, then on loading the file from the disc it is going to get a looped ERROR message for which you will not be able to get out (why not try it?). So you have to enter the longer formula, which in effect tells the computer that: "If when multiplying E7 by E1 you get an ERROR message, change the ERROR to zero. If you do not get an ERROR message, carry out the multiplication of E7 by E1".

Having structured the close looped model press the ! key six or seven times. Watch how the figures in your model will be recalculated every time you press the key, but eventually you will find that pressing the ! key has no effect on any of the figures in your model. When you reach that point you will find that VisiCalc has calculated the commission to be £10,714 (cell E5) which is 11.99996 per cent of the *net* profit of £89,286 (net of commission).

What did our CBE have to say to that? "Well VisiCalc is fairly simple to operate, but mastering the logic behind it is far more complex" (again the voice of the little boy, blaming the paper and pencil for failing the spelling test).

Come to think of it, trying to read complex VisiCalc formulae, especially those using Boolean algebra and conditional statements, can be a very mentally stimulating and fascinating exercise as well as fun. Take, for example, the following VisiCalc formulae and try to express in words what the formulae attempts to do:

```
@MAX(@CHOOSE(G7,10,20,30),
@LOOKUP(P33,Q1..Q25),@IF(A1>
B1,C1,D1*E1))
```

The formula will determine which is the largest number out of a list of three numbers, each selected from a different group of figures. The first of the three numbers to be selected will be either 10, 20 or 30, depending on whether the value in G7 is 1, 2 or 3 respectively. The second number to be selected will come from a list of 25 numbers listed in cells R1 to R25. The exact number to be picked up will be the one which is adjacent to a number in column Q, between Q1 and Q25. That number in column Q must be nearer to the value in cell P33 than any other number in column Q, but must not be larger than the value in cell P33 (the lookup function is discussed in page 2-73 of your VisiCalc manual). The third number to be selected will be either the figure appearing in cell C1 or the product of the figures in cells D1 and E1. Which one will it be? It all depends on the figures in cells A1 and B1. If the figure in cell A1 is larger than the one in cell B1, then the third number to be selected will be the one in C1, if not then the third number will be the product of D1 and E1.

Now compare this statement with the VisiCalc formula above. Even if at first the statement does not make the formula clear to you, you must admire it for the succinct method with which it expresses such a long descriptive statement. (I wonder what could be the question answered by this formula?)

Returning to our CBE, I suppose that he did not get to where he is today without relying on and following his hunches. Fortunately most of his hunches were right, or he would not have survived to become a CBE. But we are now living in the age of VisiCalc, and VisiCalc (or SuperCalc, etc.) is an ideal tool for checking your business hunches, so don't blame the VisiCalc logic for being too complex

→

	A	B	C	D	E	F	G	H
1	BAYE'S DECISION RULE:							
2	----------							
3				PRIOR			POSTERIOR	
4				PROBABILITY			PROBABILITY	
5				----------			----------	
6	TO DIVERSIFY.....			.6				
7		NEW BUILDING...			.8		.75 <--	+ D6*F7/((D6*F7)+(D10*F11))
8		NO NEW BUILDING			.2		.3333 <--	+ D6*F8/((D6*F8+(D10*F12))
9								
10	NOT TO DIVERSIFY..			.4				
11		NEW BUILDING...			.4		.25 <--	+ D10*F11/((D10*F11)+(D6*F7)
12		NO NEW BUILDING			.6		.6667 <--	+ D10*F12/((D10*F12)+(D6*F8))
13								
14								
15	POSTERIOR PROBABILITIES EXPLAINED:						TRUE <--	@AND(D6+D10=1,F7+F8=1,F11+F12=1)
16	----------						======	
17	.75 <- PROBABILITY OF DIVERSIF.GIVEN NEW BUILDING.							
18	.3333 <- PROBABILITY OF DIVERSIF.IF NO NEW BUILDING.							
19	.25 <- PROBABILITY OF NO DIVERSIF. GIVEN NEW BUILDI NG.							
20	.6667 <- PROBABILITY OF NO DIVERSIF. IF NO NEW BUILDI NG.							
21	----------							

Figure 2

when all that VisiCalc tries to do is to let you model the business syndrome with which we live. So let's now see how our CBE used VisiCalc to test his hunches.

He suspected that one of his competitors was planning to diversify. Being "management science" minded, he insisted that assumptions must always be quantified. So he gave that assumption a probability of 0.6. He also suspected that his competitor was planning to put up a new building, irrespective of whether or not the competitor was going to diversify. So he gave a probability of 0.8 to the assumption that the building will be put up to coincide with the diversification programme, and a 0.4 probability that the building will be put up even if the diversification does not go ahead.

One morning our CBE noticed that his competitor started to put up a new building. Does this mean that the competitor is going to diversify or not? Your instincts will tell you that the competitor is probably going to diversify, and you will probably be right. But in the age of VisiCalc you will be expected to quantify such an assumption. There are many amusing examples of how "common sense" conclusions could be proved to be wrong when those conclusions are quantified.

Did you know that modern decision-making involving probabilities is based on the studies made by the English mathematician and clergyman Thomas Bayes, who lived in the 18th century? Open any serious books on statistics and you will find a chapter or more devoted to Bayes' rule or Bayes' theorem. The way Bayes' rule can help you is this: Suppose you assessed the probability that a certain event will happen. Suppose also that a subsequent event which could be linked to the first event has actually happened. This does not necessarily mean that the first event did occur, but in view of the new information about the second event and with the aid of Bayes' Rule, you can now revise your probability about the first event. As it will be beyond the scope of this article to have a discourse on Bayes' rule, may I suggest you look up a book on statistics for more details.

Figure 2 is a table for making decisions based on Bayes' decision rule. What it shows is that whereas the prior probability that the competitor will diversify was 0.6 (cell D6) (as assessed by our CBE), the posterior probability of that event, having seen the new building coming up, now becomes 0.75 (cell H7).

Had, on the other hand, our CBE received definite information that the new building was not going to be put up, then the probability that the competitor was not going to diversify would have increased from 0.4 (the prior probability in cell D10) to 0.667 (the posterior probability in cell H12).

By changing the descriptions in columns A, B and C, and revising the relevant probabilities in columns D and F, you can use the model to improve the certainty of your assumptions by turning your vague prior probabilities to more definite posterior probabilities.

The moral of all these stories is that in order to make the most of VisiCalc for the benefit of your business, you need to brush up your algebra, as well as develop an understanding of the quantitative techniques used in management science. Have you heard of the driver who is always happily driving his Jaguar in first gear because being so fast in first gear, he could not be bothered to find out how to get into second and third? Are you doing the same with your VisiCalc?

Finally two points which have nothing to do with the above article: A printing error occured in the September issue of this column. The formula on the sixteenth line in the middle column of page 39 should read /FL1+A1 (substitute a + in place of the K). And for those of you who wait for the announcement about the availability of a disc containing the VisiCalc models presented so far in this series, I must apologise for the delay. I do hope however to have it ready before the end of the year.

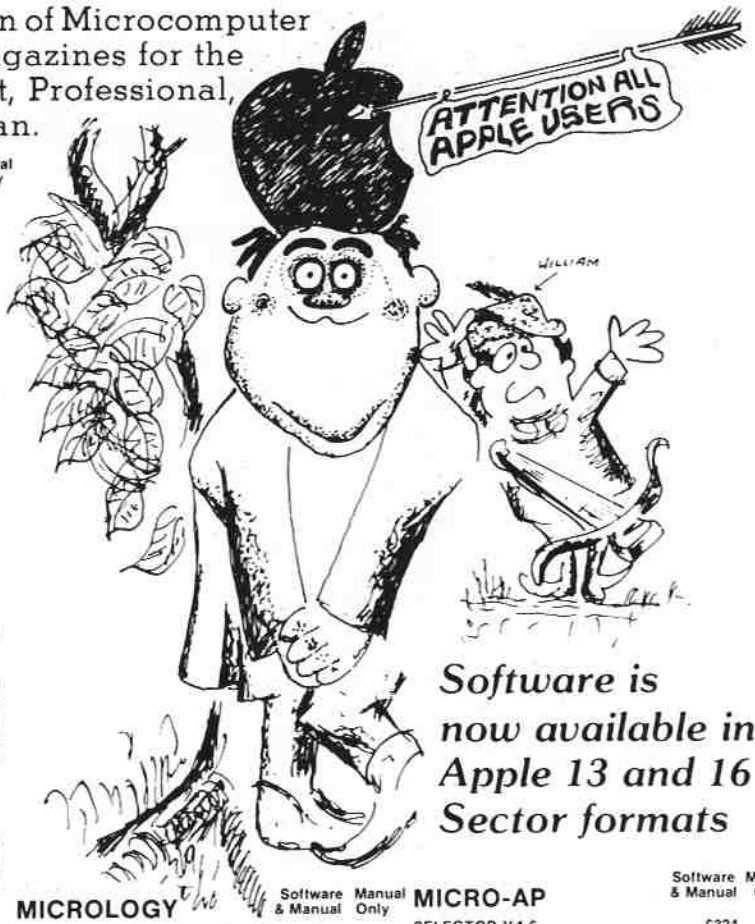
● *Next month – more on datagrams.*

MICROCOMPUTER PRODUCTS INTERNATIONAL LTD.

MPI

ROOM WF. 9-10a CAMBRIDGE HOUSE. CAMBRIDGE ROAD. BARKING. ESSEX IG11 8NT. ENGLAND
Telephone: 01-591 6511 Telex: 892395

Europe's largest selection of Microcomputer Software, Books and Magazines for the Hobbyist, Educationalist, Professional, Retailer and Businessman.



Software is now available in Apple 13 and 16 Sector formats

Retailer and OEM terms available

MAIL ORDER
TELE-PHONE
CREDIT CARD ORDER
• VISIT •

FREE Full descriptive Catalogue available

Trade Enquiries Welcome

	Software & Manual	Manual Only
ANTHONY ASHPITEL TYPING TUTORS		
BASIC VERSION	£50	
BUSINESS VERSION	£125	£25
BYROM SOFTWARE		
BSTAM—Utility to link one micro-computer to another also using BSTAM	£112	£7
BSTMS—Utility to link a micro to a mini or mainframe	£112	£13
CP/M USER LIBRARY		
51 Volumes—Price per volume		
8" disc (one volume per disc)	£5	
5" disc (one volume per 2 discs)	£10	
Index		£2
DIGITAL RESEARCH		
CBASIC v 2.08	£76	£16
CB-80 1.3	£312	£21
XLT86	£94	£8
ZSID 1.4	£65	£16
MAC	£62	£16
TEX3.0	£65	£16
PL/1-80	£315	£32
BT-80	£165	£24
FOX & GELLER		
QUICKSCREEN FOR DBASE-II	£103	£14
QUICKSCREEN FOR CBASIC/CB-80	£103	£14
QUICKSCREEN FOR MBASIC	£103	£14
QUICKCODE FOR DBASE-II	£182	£21
GRAM BUSINESS SYSTEMS LTD.		
DISKREV	£65	£13
DISKLENE	£40	£6
DISKORG	£50	£6
DISKED-2	£65	£8
DISKTOOLS-1 (DISKREV-DISKORG)	£90	£15
DISKTOOLS-2 (DISKTOOLS-1-DISKED-2)	£145	£19
INFORMATION UNLIMITED		
WHATSIT (Database Management System)	£80	
MICROFOCUS		
CIS COBOL version 4.5	£425	£25
FORMS (new version)	£100	£10

	Software & Manual	Manual Only
MICROLOGY		
FTNUMB (FORTRAN-80 RENUMBER & REFORMATTER)	£50	
MICROPRO INC.		
WORDSTAR 3.0	£294	£45
MAIL MERGE 3.0 (requires Wordstar)	£88	£12
SPELLSTAR 1.2 (requires Wordstar)	£147	£12
SUPER-SORT 1.6: Version 1	£147	£26
DATASTAR 1.101	£206	£29
CALCSTAR 1.2	£176	£29
MICROSOFT INC.		
BASIC-80 5.21	£218	
BASIC Compiler 5.3	£241	
FORTRAN-80 3.44	£306	
COBOL-80 4.60	£447	
M/SORT 1.012	£88	
EDIT-80 2.02	£76	
MACRO-80 3.43	£124	
MULISP 2.12	£124	
MUMATH 2.12	£153	

	Software & Manual	Manual Only
MICRO-AP		
SELECTOR-V 1.6	£324	£29
MPI LTD.		
MATHSPACK	£120	
STATSPACK	£120	
MT MICROSYSTEMS		
PASCAL MT· 5.5	£202	£29
PASCAL MT· 5.5 with SPP	£292	£58
Library Sources	£127	
Speed Programming Pkge. (Softbus)	£145	£29
PHOENIX SOFTWARE ASSOCIATES (For Z80 only)		
PLINK—Disc to disc link loader	£85	£18
PASM—Macro Assembler	£85	£18
PEDIT—Line editor with Macros	£85	£18
BUG—Very powerful debug	£85	£18
PDEVELOP Package with all the above	£227	£39
PLINK—2 Overlay Link Loader	£218	£18

SOME OF OUR BOOKS FOR THE APPLE

WORDSTAR Made Easy	£11.95
Programming with PL/1	£17.50
Best of Micro Vol. 2	£5.50
Programming the 6502	£10.75
Microcomputer Programming — the 6502	£7.25
6502 Applications	£10.25
APPLE II Users Guide	£16.95
6502 Assembly Language Programming	£11.95
Science & Engineering Programs for the APPLE II	£11.60
Introduction to Low Resolution Graphics	£6.00
6502 Games	£10.25

• Please ask for our full list of titles for the APPLE •

Due to fluctuations in the dollar exchange rate, we are now bringing out a new price list each month. Make sure your have the current price details when ordering. Tel: 01-591 6511

ALL OUR SOFTWARE FOR THE APPLE MUST RUN UNDER THE CP/M CARD.

ORDER INFORMATION

All this Software runs under CP/M. Most software and books are available from stock and goods are therefore despatched by return of post — so long as payment has been received. Access and Barclaycard orders are accepted by telephone. All other orders must be in writing (Telex or telegram messages accepted).

Postage on software is £3.75 per item plus 15% VAT for the first item — then an extra £0.50 per item for each extra.
Postage on books is £1.00 per item, up to three items — then £0.25 for each extra book, plus 15% VAT.
VAT is 15% on all software. VAT is 0% on all books or manuals when manuals are purchased separately from disc.

Microcomputer Products International Ltd., Room WF, 9-10a Cambridge House, Cambridge Road, Barking, ESSEX IG11 8NT, UK.
Telephone 01-591 6511 Telex 892395

Graphics galo computer illit

By PETER GORRY

I HAVE long made practical use of various computer graphics systems on main frame computers, so it was with considerable interest that I undertook to review Robocom's Bit Stik system. I was a little sceptical that it could offer a professional level computer aided design (CAD) system for the Apple, the more so at a price of only a little over £200. However, even given its few shortcomings, it really is a remarkable piece of software.

The minimum configuration for the system is a 64k Apple, two disc drives and a colour TV or monitor – although if you want hard copy you will need a printer capable of hi-res dumps or a digital plotter. The system is configured for an Epson MX80 FT (fine on my MX100) and Calcomp or Watanabe plotter. It also accepts input from an Apple graphics tablet. Unfortunately of that list I don't possess the graphics tablet so I was unable to try this out.

Although the system's real strength is its software, the most obvious feature is the Bit Stik itself. This is a sort of super joystick control which instead of the usual two potentiometers and two buttons has three of each, the third potentiometer forming the handle of the joystick itself. The normal joystick motions control the position of a cursor on the screen while the one in the handle is used for a variety of tasks. The Bit Stik plugs into the game socket and can double as a normal joystick, so once installed it can remain there.

The only hitch occurs at this point, since you also have to attach a plug to a 12v pin near the game socket, one of four which stick up nearby. Unfortunately, depending on the age of the Apple, you may be confronted with two such sets of four pins. A quick check with a meter revealed it was the rear set I wanted.

With the Bit Stik installed and feeling like I was about to play the ultimate game of space invaders (actually it does add a new professional feel to that too!) I launched into my first try out. The instructions come in four levels of complexity – a reference manual, a tutorial type manual, a laminated card of commands and finally a slip of paper on how to avoid major problems if you won't read the first three. I opted for the tutorial.

The first thing you do is copy the software, prepare formatted library and work discs (more of this later) and trim the Bit Stik (a simple, once-only adjustment for your Apple). Once this is complete you're ready to draw.

The tutorial rapidly takes you through drawing lines, shapes, circles, arcs, erasing, copying, filing, moving, zooming, painting, using nibs, locks, etc. The advice in the manual is to experiment freely (there's nothing to lose) and I certainly didn't manage to crash the system although I was sometimes surprised at the results. The cause of the surprise is nearly always that you've inadvertently switched on some option with the cursor without realising it. You learn rapidly to respect the menu selection areas of the screen.

Before going into detail of various options it's worth describing the general philosophy of the system. The first feature is that you very rarely touch the keyboard of the Apple; nearly everything is performed using the Bit Stik to select options from a menu on the screen. The exceptions to this are some input/output to disc and text input. The second concerns the way images are stored in the system. There are two types of image, picture units and work pages, and they have very different uses.

Picture units are complete little (or complex) units that are stored in a library. For instance, if you draw houses a lot you may have separate picture units of doors, windows, chimney pots – or if you design circuits they may be transistors, resistors, diodes. These units are stored on library discs, each one has three graphic indexes A, B, and C. A contains 64 items, B and C 16 each. In this way each library disc can contain a "data base" of useful modules. The indexes can be displayed on the screen so you can see what each one contains. The advantage of seeing a mini drawing of each item is considerable, you can find what you want very rapidly and of course you don't have to think up names for them.

The work page is what you actually work with on the screen. You can draw a new module and save it to the library or you can assemble complex pictures from the library units and any extra "new data" you want to put on. However, if you have used library units in constructing a picture the complete picture can not be saved as another library unit. It must be saved as a work page. This can be accessed later, but now you need to give it a name to identify it.

There is in fact a third way of saving a picture, that is to save it as a screen image – this is just a dump of the hi-res screen. The difference between a work page and a screen image is that the work page is a set of drawing instructions which you can add to, edit, zoom, compress.

I'll now attempt to do justice to some of the main features that Bit Stik offers. The simplest starting point is drawing lines. The type and colour of line to be drawn is selected from the bottom menu in DRAW mode as shown in Figure 1. The three left-most symbols represent the line type – straight, arcs or circles. You then

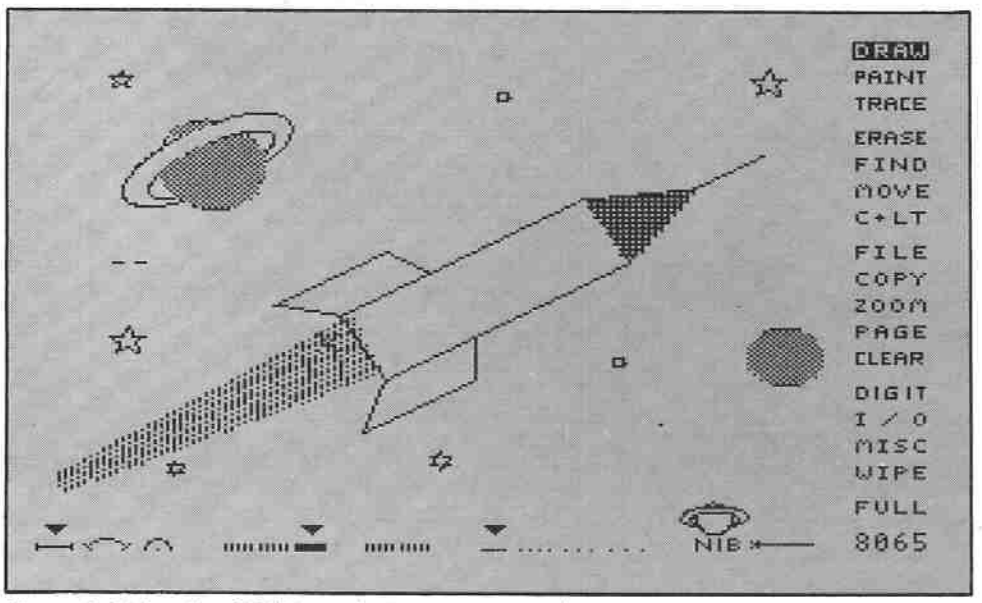


Figure 1: Using the DRAW mode to construct a picture

re for erates

have a choice of six colours (the usual hi-res colours). Following this is the choice of solid or various dotted lines. The end points of the lines are positioned on the screen with the cursor and the lines (arcs, circles) are drawn. The size of circles is determined by the handle potentiometer and you can see the circle before selecting it.

Arcs can be used to produce smooth curves since if two successive arcs are drawn they blend smoothly into each other. With practice a wide variety of curves can be drawn. Unfortunately it may take some time to acquire this practice, and I think a system of this quality really should offer a proper curve-drawing facility where curves (Bezier or cubic spline) are drawn using a few control points. There is also a STREAM mode in which a continuous line is drawn following the cursor round the screen.

For accurate positioning you can invoke a SCALE WINDOW around the cursor (its size is controlled by the handle pot). This has the effect of scaling the cursor motion so that the full range of the Bit Stik is confined to the scale window, consequently with a small window large movements of the Bit Stik become only small movements of the screen – a very useful facility indeed.

A truely impressive feature is the NIB option. When selected, the cursor becomes a line whose length is controlled by the handle pot. The best way to think of a NIB is as a paint brush or pen nib. The width of the line shows you the width of the nib. You can position the nib anywhere on the screen at any orientation and use it very much like drawing lines, but producing thick strokes. Colours and textures can all be altered, and you can even change the nib size for the two end points of the stroke – the result changes smoothly from one size to the other as it draws. A friend who works for ICL in the graphics system unit on the ICL PERQ computer (and that would set you back something in the £25,000 region) spent an afternoon trying out Bit Stik and looked suitably green at some points. I wouldn't be surprised to see a NIB feature, among others, appearing in the PERQ repertoire in due course.

Once you've drawn some shapes you might want to colour in certain areas. To do this you simply select PAINT mode, where you are presented with a palette of 16 colours to choose from. Once you have selected one with the cursor the area to be painted is pointed at and the button pressed. Hey presto, it's done; pure magic.

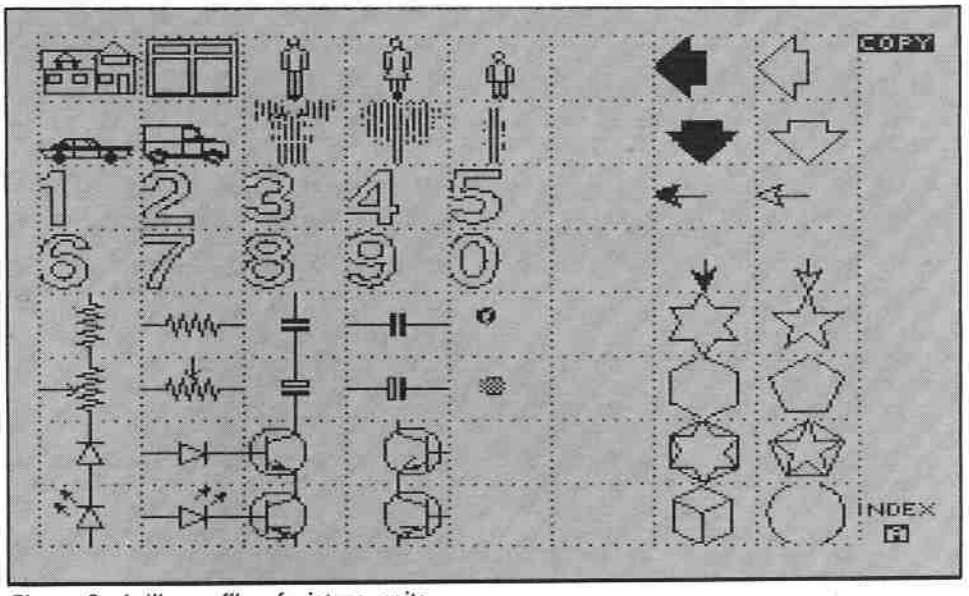


Figure 2: A library file of picture units

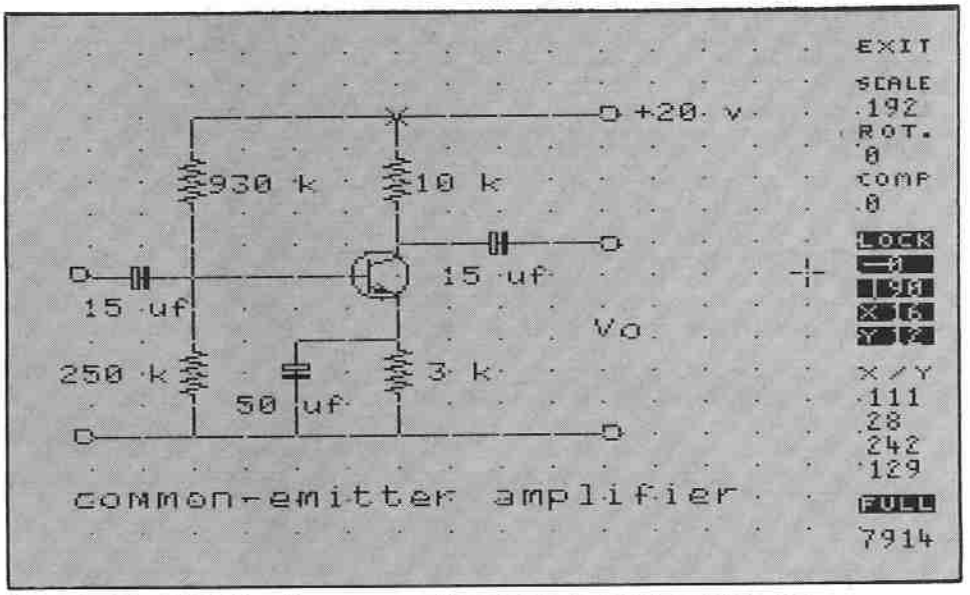


Figure 3: The LOCK function ensures all copied units are the correct size

The colour-fill routine fills in any enclosed area. If the area is not fully enclosed the colour will leak out and fill the entire picture area. My major mishaps occurred with this, especially using zoomed pictures. It's good advice to save your work page before launching into PAINT mode. I really liked it – the rewards for so little effort are very satisfying.

Sooner or later you will want to erase something, and here the ERASE option is a real treat. The erase function will work on nearly everything you've drawn, lines, circles, nib strokes, paints, text (picture units use the MOVE option as an exception). What's more, starting with the last drawn item, it outlines which feature it is currently looking at with flashing circles. As you step through your drawing each item in turn is selected. Press the appropriate button and it's gone.

Everything so far counts as "new data" and can be FILEd as a library unit for use in later drawings. We now come to how these library picture units are used. Items are selected using the COPY function. The chosen index is displayed (see Figure 2) and an item is selected using a special copy cursor which marks the four corners of the module and its centre.

When the entry is selected you return to your drawing and the copy cursor is superimposed on the drawing. At this point you can set the size of the cursor to fill the entire screen or only to occupy some smaller area. It can also be

BIT STIK

stretched, compressed, rotated and positioned as you see fit. When you've finally decided on its size, shape, rotation and position pressing a button deposits the library item on the screen.

From this simple description it is apparent just how powerful the library approach is. This power is even further enhanced by the ZOOM facility, which displays the same cursor as the COPY mode and is used to outline an area of the present drawing. Pressing the accept button then magnifies the image so that this area now fills the screen. This is not a dynamic zoom like a photographic lens, it redraws the picture at the new magnification.

This option allows you to perform accurate additions to small parts of the drawings. For instance, you may have a picture of a house and you want to put a letter box on the door. First you position the zoom cursor over the door and magnify it. The door now fills the screen. At this point you could draw the letter box, or if you have a selection in a library, one could be fetched and drawn on. You can keep zooming down and adding more and more detail. The PAGE mode returns you to the original scale, and although the detail may no longer be visible at this scale it is still there and any future zoom will reveal it.

Text can be added to a drawing very simply indeed. This is an option in MISC mode, and you actually have to use the keyboard again (if you can remember where it is by now!). The text is entered, terminated by RETURN. A "box" cursor on the picture then shows the area the text will occupy. This can be positioned and scaled as desired – press a button and there it is. The colour is selected from the palette.

The remaining major feature is the DIGIT/LOCK mode. The DIGIT option enables one to set many of the scale, rotation or compression parameters digitally rather than trying to guess their value by eye. This is especially important if you are building up pictures from a library of sub-units (like the circuit diagram in Figure 3) where you need to ensure constancy of size etc.

The remaining item is the LOCK grid. This produces a set of grid points which modify the cursor motion. The cursor will only move along grid lines or hop from grid point to grid point. This is an indispensable aid to doing drawings where the component parts must all line up accurately. The grid parameters can all be varied to set up rectangular grids, isometric grids, angle grids, fine grids, coarse grids etc. A word of advice is don't choose a fine isometric grid unless you really want one – it takes a considerable amount of time to draw it! ZOOM and COPY functions can also be locked to the grid so that a complete picture can be assembled with all parts accurately scaled and locked in position.

I developed a love/hate relationship with the DIGIT/LOCK mode. Its uses are enormous but I found more often than not that I ended up fighting it, setting things I didn't want, changing things I hadn't intended and generally messing things up. This was partly my fault for not fully getting to grips with the various functions and partly the way the Bit Stik is used to select and change parameters. They really are a little close together on the screen, and it takes careful cursor positioning to avoid altering adjoining ones too. Then, just to annoy, the LOCK mode prevents you reaching them at all and you have to override the LOCK to do so. I would have preferred a keyboard input at this stage.

Output to a digital plotter is performed from a separate piece of software. This allows a work page to be positioned and scaled anywhere in the plotter area. Several work pages can thus easily be assembled into the one picture. It is with a plotter that the inherent resolution of the drawings can be seen, and one is indispensable for quality output, with multipen plotters offering colour reproduction.

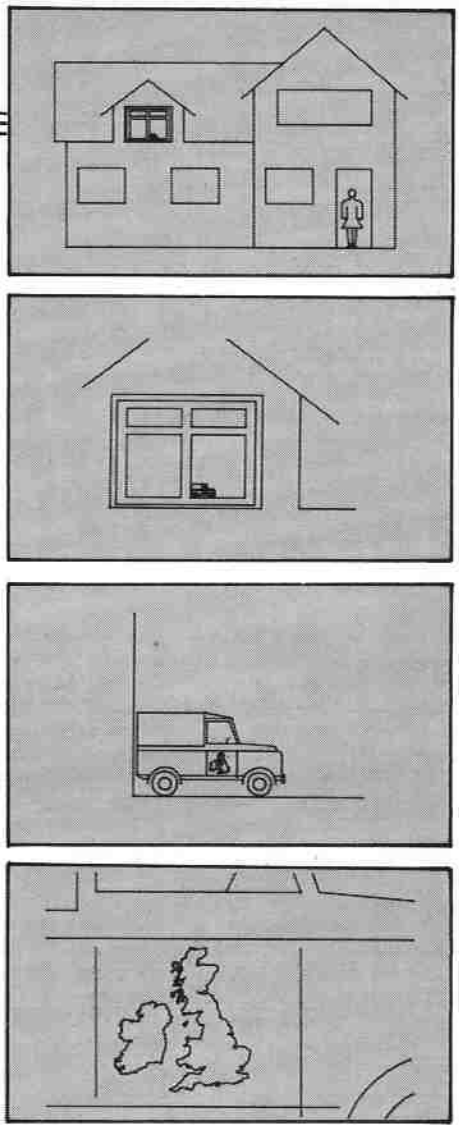
This sums up most, but not all, of the Bit Stik features, and I hope provides a reasonable idea of the scope of the system. Are there some things I would like to see in it that aren't? The answer is yes. They are: A proper curve drawing routine; the ability to input dimensions numerically and in units you want (which are then mapped internally onto the screen); lockable nibs and nibs in stream mode and a cross hatching option.

When I put these to Robocom I found that some are already in hand and due out soon. As is to be expected with a new product, feedback is needed from customers to discover what features are most missed, and to be fair, Robocom seems to be responding well to the comments received. I think the system will improve steadily with time as its few omissions are removed. It is also promised that all future updates will be upwards compatible so there need be no fear that earlier work will be unusable on updated software. I think it is a piece of software that is here to stay.

Finally, since there really isn't anything else like it, it's worth considering who are the likely customers for Bit Stik. In this sense the term computer aided design doesn't do it justice, and creative graphics perhaps gives a better feel. First it's not for engineers used to GINO or some other engineering CAD package, nor is it a graph output package, either scientific or financial; its talents definitely lie elsewhere.

The major feature of the system is that it doesn't involve any programming at all, so it can be used by anyone regardless of their computer literacy. This opens it up to a whole spectrum of people who previously couldn't use computer graphics. The prime customers are thus likely to be in business or education where it can be used to produce schematic diagrams with text, data sheets, sales presentations, advertising literature (including video presentation of course) and probably to a lesser extent draughtsmen and designers. The list is not exhaustive, and present owners range from architects to diamond assayers.

I'm afraid the individual user who would dearly like to have the system probably can't afford the price tag. Imagine how much worse it is if you've had Bit Stik for a while and it's not yours. This is one reviewer who may well have "moved house suddenly" when they come to get it back.



An example of the high resolution of the Bit Stik system: These views are successive zooms of the top window and its contents.

Version 2.0 of the Bit Stik is released this month at £445 for the controller and software. Enhancements not included in our review copy include:

- *Fully dimensioned data input and auto-generation of dimensions.*
- *Extended interactive control and faster generation of lines, circles, arcs and nibs.*
- *Enhanced locks, including nib locking and fast generation of non-orthogonal grids.*
- *Simpler user interface and transparent file structure, including the nesting of pictures.*
- *Faster picture editing and clipping of off-screen data.*

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 2640 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 16 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:

Spider Software

98, AVONDALE ROAD, SOUTH CROYDON, SURREY.

Telephone: 01-680 0267 (24 hours a day — 7 days a week)

COMPUCOPIA

Cut price Accountant

AN integrated accountancy package for practising accountants and small to medium size businesses is The Accountant, designed for use on an Apple II with twin disc drives, a monitor and, of course, a printer.

The package handles standard accounting applications such as general, sales and purchase ledgers, trial balance, date ordering, auto VAT, invoice reconciliation, complete file maintenance and file security, profit and loss accounts and report generation. Another feature is incorruptible audit trail, diary generation and modelling and bank reconciliations.

Printing features include flexible and user configurable print formats, account and transaction listings, dictionary listing in account order or alpha order and suspense account printing and query lists.

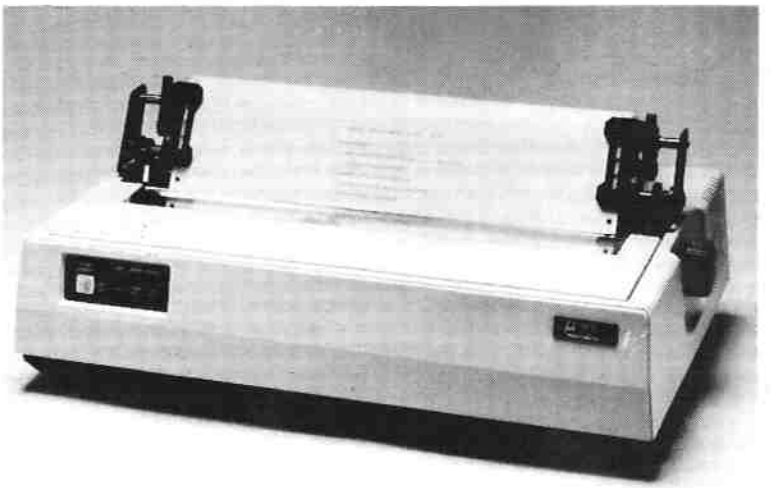
The authors say that all labour intensive activities involved in preparing a set of accounts from incomplete or insufficient records are eliminated by use of the package, which saves time and money.

Users who waited until now to buy the package will already have achieved a considerable cash saving. When it launched The Accountant in July Cybersoft Intelligent Systems were retailing the package for £950 – but they have now dropped it to £450.

Andy Bourne of C.I.S. told Windfall: "We had already sold 54 packages but we felt, looking at the market place, that although the product was good it was overpriced."

Upgraded AmperSoft

AN upgraded version of the AmperSoft utility software for the Apple II has been released by Micro-Sparc of Massachusetts. Designed for use with RAM cards of 16k or larger, AmperSoft II provides several extensions to Applesoft Basic and DOS while releasing extra space for programming by moving DOS into the RAM card.



The Microline 93

All the AmperSoft utilities are accessed from within Applesoft programs by inserting simple commands that use the ampersand (&) to direct them to the utility packages.

New functions available through simple basic commands include & PRINT (for formatting and alignment of numeric and alphabetic output); & SORT (a machine language utility for fast sorting of numerical and string arrays); & STORE/RECALL (a utility which minimises the amount of space taken by disc files by allowing storage and retrieval of numerical arrays as binary files); & MATRIX (performs mathematical operations at machine language speed on elements of any two dimensional real array); & FRE (which clears memory of unused character strings in a fraction of the time taken by Applesoft); and & CLEAR)which automatically clears memory of any or all arrays.

Also included on the disc are patches to popular utilities (PLE, FID, MUFFIN, RENUMBER and COPYA) to allow them to be used with the relocated DOS.

The disc, which is not copy protected and comes with instructions for creating turnkey systems, costs $49.95.

Microline's latest

TWO new printers have been added to the Microline range marketed by X-Data. The machines have similar characteristics but the 92 model prints 80 columns and the 93 unit 132 columns. Both have a bidirectional print speed of 160 cps and feature near letter-quality print mode, full pin-addressable graphics, a down-line loadable character set and emphasised print capability.

Other features include variable character spacing from 5 to 17 characters an inch and subscript, superscript and underlining capability. A Centronics-compatible parallel interface is standard,

→

with serial interface options available.

Retail prices have not yet been released, but the 92 model is expected to cost between £350 and £500, and the 93 model between £500 and £900. *Tel: 0753-72331.*

EPROM programmer

A SELF-contained plug-in card for the Apple II that programs a variety of EPROMs and can also be used as a straight read-only EPROM memory card, has been announced by Hollister Micro-Systems of California.

Called the HMS3264, it boasts a wide range of programming capabilities. It handles the newer 2732A (32k), 2764 (64k) and 27128 (128k EPROMs as well as older types such as the 2716 (16k) and 2732 (32k), and is supplied with menu-driven software.

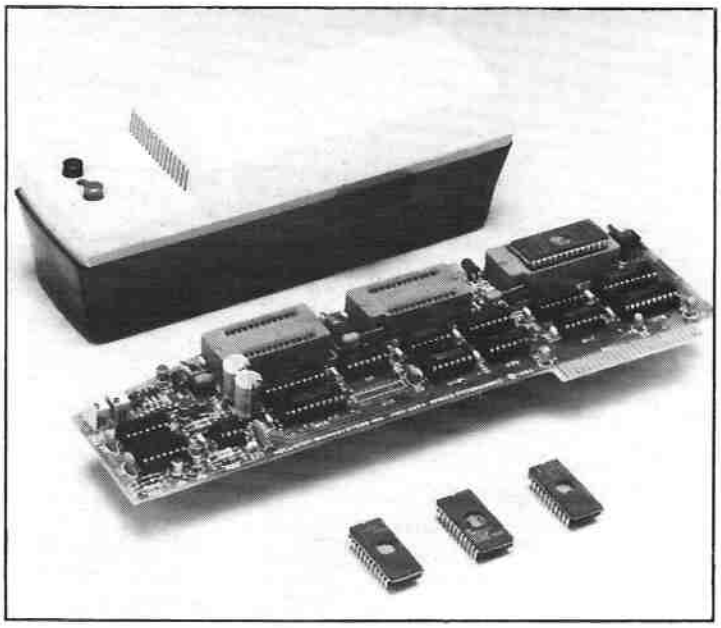
Hollister claims: "No other known, commercially available add-in programmer for the Apple II can burn 2732As and 2764s and 27128s. These require 21 volt programming power, while the older types require 25 volts. The HMS3264 supplies both programming levels, as well as proper socketing for the older and newer types."

The menu-driven software for the HMS3264 allows the user to program any portion of the target EPROM from any portion of RAM memory or from any portion of any appropriate binary file on disc.

This allows a "mix and match" capability, meaning that the target EPROM can be burned and verified using portions of several programs from several sources. For example, the data in four 2716s could be consolidated and programmed into one 2764, or vice versa.

The card also provides for monitoring of the programming on the Apple II's video screen, via updates at 1-byte intervals. On-card features include a programming voltage enable/disable switch, which protects programmed EPROMs (when the card is used as a memory) from possible inadvertent programming attempts.

A second switch, EPROM power-on/off, allows safe insertion/removal of EPROMs without having to power-down the Apple II itself. The card is available from Pete & Pam. *Tel: 0706 227011.*



Hollister Microsystems EPROM programmer plugs into Apple II and programs 2716, 2732, 2732A, 2764 and 27128 EPROMS

System for sore eyes

SUCH is the pace of change in the micro-world that a discussion about video glasses for VDUs might well have users altering their concept of an intelligent terminal. However developments haven't reached that stage yet. Instead Video-Glasses is an anti-glare screening system intended to reduce eye strain, headaches and other symptoms associated with the use of VDUs. It is designed and developed in Sweden and costs £16.75.

The UK distributors, File Binders Ltd, say the system enhances the clarity of the text image while reducing by 75 per cent unwanted reflected light from the rest of the screen. It consists of a lightweight frame and sepia-tinted woven mesh. It can be tailored to fit any type of monitor and can be easily fitted, or removed for cleaning. *Tel: 01-659 0190.*

Pascal routines

PASCALC is a collection of Pascal routines residing in the SYSTEM. LIBRARY which can be invoked by any program written in Apple Pascal 1.1.

The set includes routines for Pascal TYPE conversion between INTEGER, LONG INTEGER, STRING and EXTENDED numbers; reading and writing routines for EXTENDED numbers and routines and supporting utilities for a system of runtime error handling; and a suite of basic mathematical routines which employ EXTENDED type numbers emulating mixed integer and floating point arithmetic.

Under the latter the precision, or the number of digits in the EXTENDED numbers, can be chosen by the user at compile time from a set of eight values. The minimum precision is seven, and the maximum 35, and the terminal digit of floating point numbers is rounded and not truncated, as in many real number implementations.

PasCalc comes together with PasCalculator, a one-line command processor written in Pascal which gives more function and flexibility to the parent program, and which allows the five arithmetical operators to be used in conjunction with any degree of nesting of parentheses to control the priority of a series of calculations, and it keeps a session log which can either be printed out or purged at any time during or after the session.

The package costs £64 from Mathematical Software Services. A user guide is available for an extra £12. *Tel: 0483-69055.*

Improve your programs

NEW on the market is a graphics program which distributors Avant-Garde Creations of Oregon claims will explain everything one needs to know to create high quality, marketable programs using Apple hi-res graphics. It adds that the programs contained in Hi-res Secrets Graphics Applications System by Don Fudge can transform a good programmer into a great programmer "like magic."

The package is designed to lead the user step-by-step through such procedures as ordinary Basic programming to

faster, better basic programming; and from Basic hi-res graphics to assembler hi-res graphics. Other procedures include business graphs, electronic and architectural design, arcade and adventure game creation, scene creation, 3-D shapes, shape drawing and shape and scene saving. The program also contains a very fast colour-fill routine.

The package runs on a 48k system, includes three unprotected discs and a 200-page manual, and costs $75.

Exit reflections

ANOTHER filter designed to reduce the possibility of eye strain, headaches and fatigue caused by the reflection of light on monitors is the anti-glare screen from Ranmor Computing. A rigid frame surrounds a very fine mesh which reduces glare and reflected light by about 75 per cent without affecting the image on the screen. Ranmore says that apart from the benefits to the operator, use of the screen means that brightness and contrast levels on the monitor can be turned down, thus increasing tube life and reducing image burns on the screen.

The screen costs £19 and is simply fitted by the use of two top-mounted clips. *Tel: 0702-339262.*

Newsagents' package

A PROGRAM suitable for the newsagent with a mixed business including credit accounts for tobacco and stationery is Newschappy, from Adam Software. It accounts for daily, weekly and monthly publications and allows a user immediate access to balance, statement and receipt preparations.

The program can produce daily rounds lists and maintains automatic updating facilities for customer accounts, also taking into account casual purchases.

The package costs £950. It can be extended into a fully fledged accounting system covering sales, purchase and general ledger under the Adam business accounting system from City Computer Centre, the UK distributors.

The latter is a book-keeping and management accounting program with all the requisite audit trail and security safeguards.

The sales accounting program comes in four versions ranging from simple hard copy entry to fully integrated sales and stock control. The general ledger includes reversible accruals, normal journal entries and protects VAT accounts, enabling the automatic production of quarterly or monthly VAT reports. *Tel: 01-588 5537.*

DESIGNED to take up less space than conventional computer printout binders, the Samson Data Binder may be filed on its spine or stacked flat on a shelf. It can be used for both active and archival filing, is easy to load and opens out flat to display the contents fully. A box of 20 binders costs about £28 from D.N.C.S. *Tel: 061-643 0016.*

Plus for Grappler

ORANGE Micro of California claims it has the most intelligent Apple printer interface on the market in Grappler+, an enhanced version of the original. The new interface has dual hi-res graphics, allowing the user to dump hi-res pages one and two simultaneously, thus enabling graphic screen dumps to be printed side by side.

An on-board dip switch requires only a quick setting to make Grappler+ work with all popular dot matrix printers. It is compatible with Apple III and its Apple hardware compatibility permits use with such software as VisiPlot and Apple Plot.

Graphic and text combinations can be dumped to a printer and text commands include screen dumps, setting of margins and page lengths, auto skipover perforation and word wraparound with breakpoint at nearest space.

The interface is compatible with Pascal, CP/M and LOGO. It is available from Pete and Pam for £99. *Tel: 0706-227011.*

Top secret files

DESIGNED for a company with between 20 and 200 employees is the Pedagog Personnel Program, a menu-driven system in which confidentiality is assured by a password/encode facility and a locking device.

Individual records may be displayed and/or printed on demand or out-sorted on individual fields, and there are fields for next-of-kin, joining date, birth date, sex, marital status, job code and so on. Applications examples include the display or printing of records of any employee whose salary exceeds a certain amount or the selection of details of every male employee in a certain department who has served for more than a specified number of years.

File initialisation and security copying facilities are standard, and the package runs on a 48k Apple with two disc drives, DOS 3.3 and an Epson printer. Centronics models can also be configured. The package costs £89. Tel: 0485-40604.

High speed buffers

TWO microbuffers for Epson printers will accept data as fast as the Apple can send it, store it and then take control of the printer to release the Apple for other work.

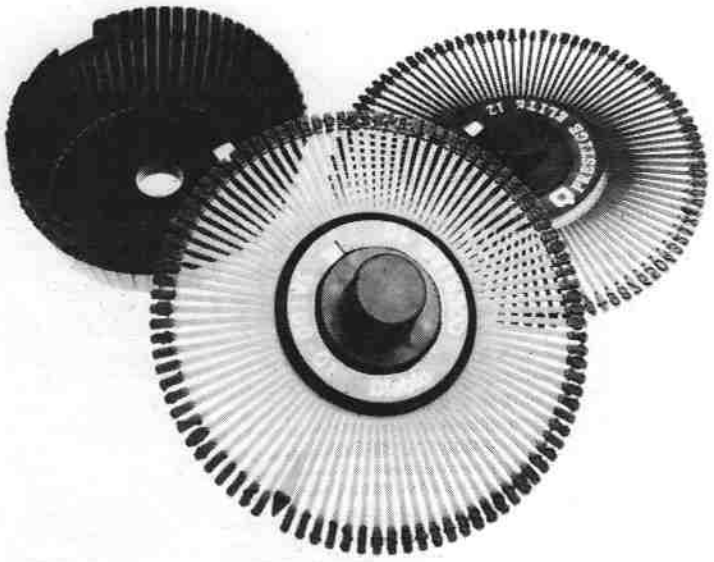
Model MBK-16k is a Centronics-compatible parallel interface with 16k of on-board RAM for data buffering. The MBS-8k is an RS232C serial interface with both hardware and software (x-on/x-off) handshaking, baud rates from 300 to 19,000 and an 8k RAM buffer.

Both models cost £119 from Northamber. They fit the existing auxilliary interface connector inside the Epson MX80, MX80 F/T or MX100 without modification, and are compatible with standard Epson cables and printer control software. *Tel: 0372-66397.*

Got a N. Sea oil well?

AN accounting package is now available for oil and gas well operators. Using an Apple II or III the package automates joint interest billing and revenue distribution. It calculates revenue distribution from production runs for each revenue owner,

joint interest statements for all working-interest owners, and other reports. The package also generates well pay-out reports and records the balances of revenue and working-interest owners. Gusher, from High Technology Software Products of Oklahoma, costs $995.



Inmac have printwheels for most machines

Printwheels galore

A COMPLETE range of printwheels and thimbles to suit Qume, Diablo and NEC printers are carried by the mail order firm Inmac which says it keeps large stocks of all the most popular typestyles to ensure prompt despatch of orders. Unusual fonts take up to a week for delivery.

Inmac printwheels are manufactured to printer manufacturers' specifications, and many of them are compatible with machines other than Qume, Diablo or NEC. Prices range from £6. *Tel: 04427-74296.*

Character buffer

A 16k print buffer card which replaces either serial or parallel interface cards and incorporates an on-board character buffer is available from Opus Supplies.

The buffering feature frees the Apple from driving the printer, allowing it to be used for other tasks while the printer is driven by the buffer card's on-board processor.

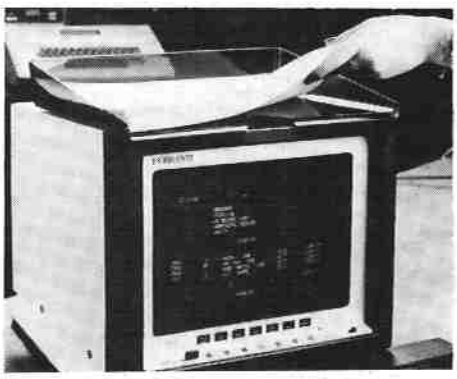
The card can be plugged into any of the Apple slots from one to seven and handles serial RS232 and parallel Centronics printers.

It has eight selectable baud rates 110 to 9600 and is x-on/x-off supported throughout this range.

Selectable options are autoline feed insertion, serial or parallel primary output and seven bit or eight bit transfers. Options are also software selectable.

The print output can be directed to the serial or parallel output at will by the insertion of control characters in the buffered character stream.

The card costs £129.95 and has a manual detailing set-up and operation. *Tel: 01-464 5040.*



ANY acrylic storage tray that fits on the top of a monitor is available from Inmac for £19. It is not a good idea to put discs on top of the monitor as they could be corrupted, but the tray can be used to store printouts or other documents in use when keying in information. *Tel: 09285-67551.*

Faster Flexitext

AN up-graded version of The Editor word processing package for the Apple, Flexitext, has 80 columns, a memory cruncher and is faster than its predecessor.

David Sherwood, of distributors Forester Software, claims that the package is a worthy rival to Wordstar. He told Windfall: "It can do almost anything that Wordstar can (except split screens, give interactive help and spool to disc while inputting) and a lot more besides."

The package features standard text editing commands (including insertion, deletion and tabulation), superscripting and subscripting (fractions, powers, chemical formulae) and single key execution of multiple commands.

Commands may be repeated at will and there is an automatic repeat of multiple commands. A conditional hyphenation function provides for improved layouts and text can be justified to the right, left or both.

Flexitext can be used to generate a full random file database and allows the flexible merging of text and random files.

One program option is a precis of the instruction manual which can be called up as a memory aid.

David Sherwood also says that all the programs on Flexitext will interface to and handle any standard random access files. The package costs £300. *Tel: 01-579 6771.*

Time saver for architects

AN accounting and job costing system written for architects has been designed specifically to reduce the time a practice spends on routine accounting functions while also improving the quality of management reporting available.

Archaid is user friendly and is built up from six integrated modules – nominal ledger, job costing/fee analysis, payroll, purchase analysis/cash book, sales ledger and management reports. The package costs £3,500.

Program authors and distributors CIC say one of its major features is the job costing module, sometimes referred to as the cost book or job file, which allows immediate access to the costs incurred on each job and the time and expenses in each of the RIBA designated work stages.

Up to 300 jobs can be held on file. Summaries can be displayed or printed, giving an up to date costing of each job, either as a whole or in sub-divisions for types of contract or partners' responsibility.

The summary shows total hours, technical salary costs, expenses, reclaimable expenses and fees due for each contract.

APPLE MEDICAL FORUM

The second Apple Medical Forum one day meeting will take place as two parallel sessions covering General Practice and Hospital applications with speakers in the morning and demonstrations and discussions in the afternoon.

This event replaces the one previously advertised which was due to be held on 24th September 1982. The newly scheduled Forum will now be held at

Middlesex Hospital Medical School
Cleveland Street, London, W1P 6DB
on Friday 17th December 1982.

The object of the meeting is to allow all people working with, or interested in, Apple microcomputers used in medical applications to meet, discuss and learn what is going on within the profession.

If interested, please fill in the coupon provided and return it to Dr D G Jameson, Physics Dept, Middlesex Hospital Medical School, Cleveland Street, London W1P 6DB, by 1 December 1982, with your remittance.

Overnight accommodation is available in the adjacent student hostel.

Any person interested in giving a demonstration should contact the organisers.

GENERAL PRACTICE

Speakers:
Dr J Dawson, British Medical Association – The IT 82 view of the use of microcomputers in general practice

Dr S Kelly, West Midlands – Obstetrics monitoring

Dr P Rennie, Idle, Nr Bradford – General Practice software for an Apple ///

Mr T Benson, Abies Informatics – 'Mickie' – the medical interviewing system

Dr S Harrison, Taunton Elect Ltd – The Doctors Office

HOSPITAL APPLICATIONS

Speakers:
Dr D Lloyd, St Bartholomew's Hospital – An Apple for organising evoked potentials

Dr A Flithorne, Institute of Neurology and the Royal Free Hospital – Clinical applications in neurology and psychiatry

Dr D G Jameson, Middlesex Hospital Medical School – Real time application in respiration studies

Mr K Drew, Drew Scientific Ltd – Networking with an Apple

Mr P Poon, Kings College London – MAC Apple applications for Handicapped people

Mr T Lind, Princess Mary Maternity Hospital, Newcastle – Application of Apple High Reg graphics to obstetrics sonar scanning

There will also be demonstrations to supplement various speakers and an opportunity for those attending to demonstrate their own software if they wish.

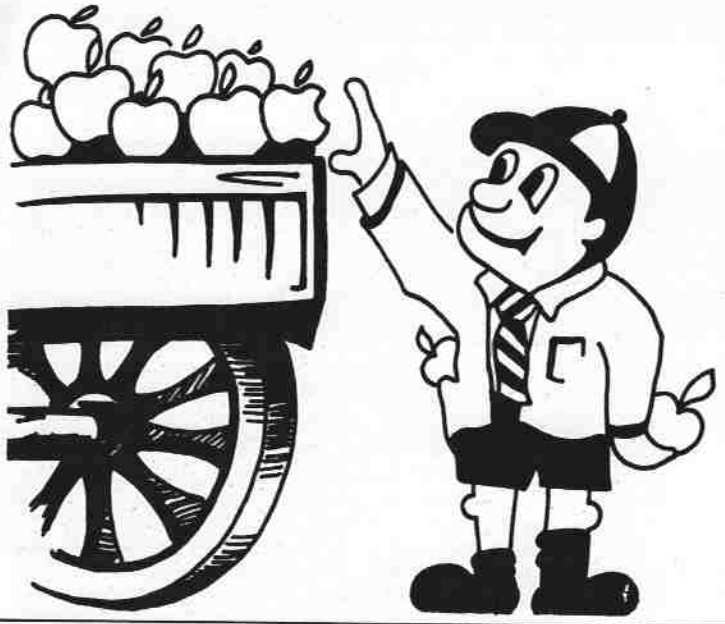
apple™
the personal computer

Name: _____
Address: _____
_____ Tel: _____

I would like to attend the 2nd Apple Medical Forum ☐
My professional training is in the following field
_____

I enclose £18.00 being the conference fee ☐
I enclose £10.00 (inc VAT) per night for overnight accommodation on the 16/17/18 December 1982 ☐

*Apple is a trademark of Apple Computer Inc U.S.A. TICK RELEVANT BOX WI/II



Applecart

Monthly review of Apple in education

Pitfalls in producing educational software

By R. E. LEWIS

PERHAPS the most appealing feature of a microcomputer is the instant feedback and untiring response that it gives. Whether you are using it to write your own programs, to help run your business, to educate your children or to play games you are bound to become engrossed.

This amazing ability to focus the user's attention and totally absorb them gives the micro a tremendous power. It can be a most effective teaching tool, as demonstrated by the example of a group of mentally retarded children who became so engrossed in a Space Invaders type game that their concentration span was dramatically increased and their subsequent capacity for learning was much improved. If an apparently trivial game can have such dramatic effects, how much more must a properly designed educational game or teaching program.

The danger is, of course, that children will become as totally absorbed in a badly designed program as a good one. Inaccuracies can slip by if programming is sloppy, particularly in the area of the computer/user interface, i.e. the handling of input from the keyboard and output to the VDU. Such is the infallibility ascribed to computers (at least by children) that incorrect or inaccurate information learnt at the keyboard is not easily remedied.

When we first bought our Apple we looked around for suitable educational software without much success. Some teacher-written programs were based on sound educational ideas but were badly written and ran poorly. Other professionally written packages were sophisticatedly programmed but educationally unsound. Both sorts failed in the area we felt to be most important, that of communicating with the user.

The problem is that most teachers are short of the time and programming expertise to produce a robust and smooth running program and most programmers do not give enough attention to the educational importance of presenting their subject matter clearly and at the right level, especially where children are concerned.

We felt we were at an advantage having both teaching and programming experience between us and, because we enjoyed programming anyway, we decided that writing our own programs was the best (if not the quickest) way to get software at the high standards we felt essential in an educational program.

In the short term we felt it would help our own children and, in the long term, we hoped that other parents and educators might find our programs of interest, in which case we would make the programs commercially available. In fact it was only a few months later that Kingfisher Computer Services was launched.

In designing our programs (aimed mostly at children in the 5-12 age range) we have tried to keep in mind the features we feel to be most important:

☐ Robustness: The program should never fail either due to programming errors or to unexpected inputs from the user.

☐ Ease of use: Instructions should be clear and unambiguous (for the teacher or parent supervising the program as well as the pupil working through it). Questions should be set out simply and the choice of response made obvious. We also decided to include an optional practice session in every program for those who had never used a computer before to familiarise themselves with using the keyboard to respond to simple questions before starting the main program.

☐ Presentation: The screen format should be clear and consistent. Text should be easy to read, it should not fill the screen or scroll up in unmanageable proportions. Graphics should be neat and appealing but relevant and not just gimmicky.

→

Sound could be used to add interest.

☐ Flexibility: Program content should be variable wherever possible in terms of vocabulary or level of difficulty to cater for wide age and ability ranges. In school this means that the program can be used with several classes, and at home the program grows with the child and does not become obsolete after a few months.

☐ Backup: Good documentation is an essential part of any software package. We always include a full description of the program content with an explanation of the levels of difficulty used to assist parents and teachers to choose a level suitable for each individual child.

All these features are aimed at making the program run simply and efficiently. But arguably more important than any of these is the subject matter and educational aim of the program.

For a child's initial exposure to a computer the subject matter might not be thought to be crucial. Just learning to communicate via the keyboard could be an educational aim in itself. Alas too many programmers have adopted this approach and produced meaningless and poor programs as a result.

Educational programs may assist in teaching new facts or in practising previously learned ones. In either case wrongly answered questions must be corrected and care must be taken not to reinforce any wrongly learnt or misunderstood facts.

Teaching programs should of course go further. Lesson structure must be carefully thought out and the content presented in clearly defined steps with remedial help available at every stage. If the pupil has to ask teacher or parent for help then the program has failed (assuming the pupil has reached the required level to attempt the lesson and this level should be clearly defined in the documentation).

Some of our programs are concerned with practice like crosswords (spelling and word structure) and Monster Maze (arithmetic), which were reviewed in Windfall in August. Others are teaching programs like our newest, Fraction Action, which teaches how to add and subtract fractions. We are always interested to hear from parents and teachers of topics which they would like to see as the subject of future programs and are very happy to answer questions or give help on any aspect of using computers in education. We can be contacted by letter at Kingfisher Computer Services, Durley Lane, Keynsham, Bristol BS18 2AQ or telephone (02 756) 68152 or 5009.

APPLES in education link old and new technologies, the modern business and scientific worlds with the classroom. They also generate endless discussion as to what they can, or can't be used for – which is what Applecart is all about.

However the Bletchley Computer Centre (now taken over by the Milton Keynes Computer Centre) decided to have a look at the subject from the inside out as it were and asked pupils to say why their particular school needed a computer, offering an Apple system as a first prize.

The winning essay was from 11-year-old Richard Doy, who submitted it on behalf of Abbeys Middle School, Milton Keynes. Richard said he was sure learning and pleasure could be combined in the use of a computer, and went on:

"Computers could help millions of people all over the world. Gradually the more tedious and time-consuming jobs are being taken over by computers, so the more children who learn about them at an early age the better, because when we all leave school that's all there will be . . . computers."

The school staff could use the Apple for financial problems "and it could store vital information and aid Mr West, my headmaster. When he orders stock he can check to make sure that all the prices add up so the school can't be cheated. I hope I have managed to show how I feel and how great it would be if we could actually have our own computer at school," said Richard.

"Computers are part of the future, and it would be really good for me and my school if we could share in the future."

Michelle Kellingray, of Great Doddington Primary, took the second prize of £250 towards the cost of an Apple for her school. She wrote: "The Apple computer is a fascinating piece of equipment. It would improve our ability to think logically and react quickly. With modern jobs nowadays if we learnt to use an Apple, or any kind of computer, it would probably be easier to find a job when we are older."

Michelle said the Apple would be used by everybody at the school, from the four year olds to the 11 year olds, and she described the school's borrowed machine as "a marvel to all of us." She said having an Apple would be like having a second teacher, and added: "The computer cannot get cross or impatient with us or get things wrong like a human teacher would. So we would not get in a mood with it. A computer would not get in a mood with us either.

"If we had an Apple we could learn maths and other lessons and enjoy it at the same time. The computer makes the work more exciting. We have found that even the children who don't like working hard normally work more for the computer than they do for our teacher".

Barry Stafford, also from Great Doddington, said his school was very small and couldn't afford a computer. "If we had one it would not just help us but it would help the teacher as he would not have to do all the teaching. It would also make up for the lack of books and would make the updating of information easier".

There were 10 finalists, including Gary Coster

Competition winner Richard Doy, carrying his prize, is pictured with the managing director of Milton Keynes Computer Centre, Peter Morris

The child's view of computers

and Chris Fox of Fairfields, a school for physically handicapped children of all ages. They wrote: "An Apple incorporated with a voice synthesiser could help Nicola, aged four and totally blind, to learn to write. Every time she pressed a key on the computer the voice synthesiser would 'speak' and in this way she would know whether she had selected the correct key".

Most essays suggested that having an Apple would make learning easier. They also revealed a little about children's attitudes to teaching methods. Said Matthew Paul, of Lakes County Middle School: "The teacher can't always give everyone enough attention. I think a computer would let everyone learn at their own pace. I expect we would still need to practice sums and spelling but at least a computer wouldn't get annoyed if we made careless mistakes or took too long. It would encourage people to try because they would know the computer would give them another chance if they needed it."

And he concluded, with a wisdom beyond his years: "Computers can do some jobs better than humans, as we need to use computers to help create new jobs. Instead of working like robots, people can build robots to do the boring, repetitive jobs. Having a computer in school will make everyone realise how computers will cause changes to our way of life."

High Seas passage to progress

By GERALD PALMER
St Mary's School, Middlewich

THROW together an Apple, pirates, treasure and adventures on the high seas and you have an excellent basis for an effective and entertaining educational tool. Treasure Islands, from Cambridge Software House, doesn't just test a child's ability to react quickly or to score high points – it teaches a lot in a subtle way, under the guise of intrigue and adventure.

The program consists of one disc, printed maps and an information sheet, and the game involves two ships and their crews. One ship has to collect treasure from the islands which are shown on a grid, both on paper and on the screen. The other, a pirate vessel, is intent on capturing the treasure on the high seas, and it does this by finding its opponent and moving on to the same coordinate.

Technically any number of children can make up a crew, but smaller groups give the children more chance of involvement in planning and directing their ship towards its goal.

Before starting, each crew is told its own starting position, the direction of the wind and the amount of treasure on each island. It's also a good idea to offer other pieces of information – like: the pirate ship moves quicker than the treasure ship; the treasure ship slows down as it increases its load; and the wind direction affects speed depending on the direction chosen to sail – rather than leave these areas undefined. However other factors should not be disclosed but left for discovery in the game itself.

There is a port on each of the four islands and the treasure ship has to pick up its treasure from at least three of the ports before sailing off the map to safety. Whenever either ship enters a port information as to the whereabouts of the other ship might be given. For example the treasure ship is told how much treasure is on board, and the pirates whether the treasure ship has been to that island and how much treasure they have collected. Given this information, plus a special code for each crew, the contest can begin.

The program was tried out on top junior pupils who had been using an Apple for more than a year, and so the excitement generated by the introduction of the program was not caused by the novelty of computing. The program authors say children might be confused at first – but while this was true, they soon overcame their confusion and were enthusiastically awaiting their turn.

Standards of information recording improved dramatically once penalties for errors became apparent in various shipwrecks and lost moves.

And group discussion *(something many teachers find very difficult to generate genuinely and spontaneously)* was a joy to behold. There were frantic debates as to the next move and which was the best way; what bearings to take and what difference the wind direction would make. Group leaders evolved, and the more able tended to take the decisions, but on a level where they had to justify them.

The children took turns keying information into the Apple using a code which enabled only themselves to access the information relevant to their ship, and when a code was "leaked" by an informer there was genuine anger and threatened retribution. The total involvement in the game was evident.

Treasure Islands is similar to Battleships only in that coordinates are used to pinpoint the ships' positions. The use of the computer to enable the treasure carrier to take evasive action, and the introduction of surprise calms, winds and reefs, often at critical moments, give the game far more appeal. Coordinates do play a large part in the game, (these run up to 31 on the x axis and 21 on the y axis) and children soon learn where such points as 24, 12 are.

A short lesson on coordinates may well be necessary, but one of the points of the program is to provide practice in their use – and what better way to learn them?

The same can be said with regard to compass bearings. The direction of the ships has to be fed into the Apple by defining angles in multiples of 45 degrees. Thus the children soon become familiar with the various occurrences of 225 degrees or 315 degrees, etc. The wind direction is given in the corresponding compass points. Children end up setting a bearing of 180 degrees and noting that if there is a south wind the ship will be hampered. It is an exciting way of practising the use of compass bearings and large angles.

The game requires considerable decision-making and strategic planning. For example, if the pirates know or guess that the treasure ship has visited an island (this can be deduced by the amount of treasure on the ship) they can then try to predict which will be the next island visited and start to work out an interception point. Pirate ships are faster than treasure vessels, so the situation of being stuck a regular two squares behind does not arise. But it is not that easy. There are still unforseen hazards. Visual contact is established when ships are within two squares of each other, which gives the treasure vessel a chance to alter course. This is one of the reasons why the group discussion is so intense. There is time to work out the moves and to take the necessary action. There were no missles in pirate days.

There are various levels of play – straight, or with a differing amount of what might well be a real-life situation in a real combat. The authors stress that the crews should not be told too much; that the logic should be theirs; that they should work out for themselves which islands have already been visited by the amount of treasure on board, or the fact that they will be penalised if they enter a 'safe zone' while the treasure ship is in port. It is with discoveries like this in mind that the game should provide much future challenge and keep pirates and their foes on their toes.

However this aspect of "need to know" is also an area of criticism of the game package itself. It might be all right witholding information from the pupils, to be discovered at their own pace, but what about the teacher? On booting the program there is a fairly lengthy graphic introduction, pleasantly done, but a bit tedious as one gets used to it, followed by menu options – whether a straight game is required, or one with added obstacles. However one is expected to know that these options are chosen one at a time – no instructions are given.

Another fault: If a crew misses its secret code then access back into the program is prevented. Short of guessing all the numbers up to 1,000 the computer has to be switched off – the normal control characters do not have any effect – and one has to start again with the lengthy graphics introduction.

The secret code is a good idea basically, but there did seem a regular repetition of some codes. School groups should perhaps work in isolation to prevent copying of information. This is easier said than done in many cases. Within a classroom it was not too hard to discover information vital to the enemy.

Perhaps one of the valuable lessons to be learned is how to keep things secret or using off-putting remarks such as: "We will hit Cook Island if we keep going that way" – when in fact the sailors were nowhere near that spot. One cunning strategy was the 'accidental' leaving of a map with totally erroneous positions marked on it. Strategies like this threw the pirates completely.

The length of time taken by the game depends on the players, but tends to go on into lunch breaks, etc. This effectively puts the computer out of use for other groups and it might be useful if a game could be saved somehow and resumed later. However schools shouldn't allow this to put them off the software. It is an impressive program, fun to use and with a distinct educational base.

Buy our £475* Daisy Wheel Printer for your computer and you have an Electronic Typewriter absolutely FREE

The T/Printer 35 is the lightest weight and lowest cost daisy wheel printer you can buy for your computer. So it will fit within your budget and you can carry it wherever you take your micro. Yet it is tough enough to give years of reliable service. Interchangeable typefaces (standard Olivetti 100 character daisy wheels), variable pitch, multiple copies—all the features you would expect of more expensive word processing printers.

Yet the T/Printer 35 costs only £475 with parallel interface. Operating speed under computer control is approximately 120 words per minute of letter perfect output. What typist can equal that?

Then when you're finished using it as a computer printer, the T/Printer 35 is ready to go right on working as an electronic typewriter.

That's the dual-purpose T/Printer 35—the versatile computer printer that fits your budget.

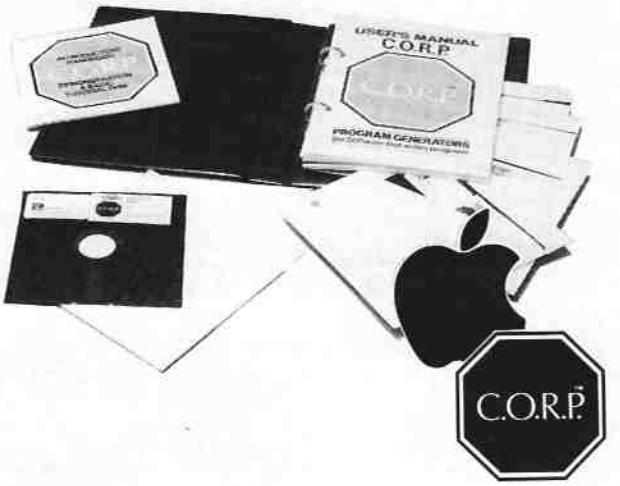
**The T/Printer 35 costs £475 with Centronics compatible parallel interface. With RS-232C interface it costs £535. Prices listed are exclusive of VAT.*

DATARITE

Datarite Terminals Ltd
Caldare House
144-146 High Road
Chadwell Heath, Essex RM6 6NT

Tel: 01-590 1155

increase your Apple harvest



C.O.R.P., a system of program generators that writes menu driven 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. Error-free professional computerised card-index 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 - BSP
- *a printed report generator - BSP
- *a diagnostic package inc., memory check, drive, printer and disk checks.
- *a Basic language tutorial - BSP
- *a (booting) menu generator
- *a forms letter generator
- *a user demo with program examples - BSP
- *a superb Datafile Editor
- *a Datafile merge option
- *program regenerator for calcs and inclusions

Applications already in use include;

1 - Data entry storage and retrieval of -
  (a) personnel records
  (b) product information
  (c) rental records
  (d) customer data
2 - Stock control systems
3 - Letter/word processing
4 - Hotel reservations systems
5 - Fixed assets and depreciation schedules
6 - Project records and control systems
7 - Mailing and labelling systems

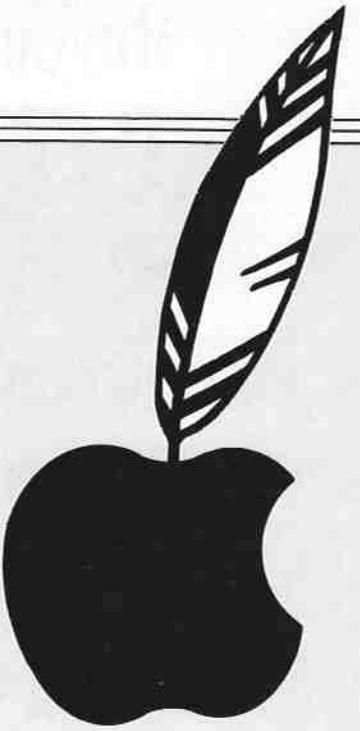
No other program generator extends the potential of the Apple like C.O.R.P. Complete C.O.R.P. system - £249. Master Disk (Database/Print program generator) £125. Demo Tutorial - £25. Utilities Disk 1 - £75. Utilities Disk 2 - £29. Diagnostics Disk - £24. Beginners Starter Pack (BSP) - only £125.

Make the most of your Apple - increase the harvest. Write for list of authorised dealers and further information.

Dynatech Microsoftware Ltd.,
Summerfield House, Vale,
Guernsey, Channel Islands.
Telephone: 0481 47377
Telex: 4191130
Apple and C.O.R.P. are registered trademarks

DYNATECH MICROSOFTWARE

DOUBLE SIDED DEMODISK/TUTORIAL available separately at £19.00.



Data needed for servicing our Apples

AN increasing number of Apple IIs are being used in the laboratories of the Central Hospital here in Inverness. My Department undertakes electronic servicing and is being increasingly called upon to assist in repairing the Apple components. We have well equipped workshops, skilled technicians better equipped than our local agents, but often have difficulty in servicing Apple units, particularly the disc drives, because of lack of technical data.

Our geographical position, distant from any large centre, hospital finances, and increasing use of the Apple here, ensures that it makes sense that we should be able to undertake all aspects of servicing from within our own resources. I am writing to you in the first instance in the hope that you will be able to direct me to a source for the technical information we require. – **A.R. Bowley, Deputy Director, Department of Medical Physics and Bio-Engineering, Raigmore Hospital, Inverness.**

● Most of the information you require can be found in the Apple Reference Manual. There is also a disc, marketed under the name of Brain Surgeon, which will "psychoanalyse" the Apple and help with fault diagnosis. Apple UK, which emphasises service and back-up in its marketing, is at Hemel Hempstead. Tel: 0442 60244.

Non-running programs

LET me congratulate you on an excellent magazine. As an Apple user of only six months standing I find it generally very understandable and certainly useful. However one or two things could be changed for the better!

In particular, may I refer to the September issue (pages 44 to 47) – the article by Ed Peach on Med-Res Graphics. A newcomer like myself, although the listings are obviously a machine language, would be at a loss to know where to start.

After telephoning your office I was able to type in the program and save to disc. I can see that to those more familiar with computing stating how and what to type at the keyboard might seem to be beneath them, but I am sure that to many readers in the same position as myself this kind of information would be totally relevant.

My problems did not finish there. On BRUNning the program nothing happened (except for loss of the prompt and a sinking feeling after hours of keyboard bashing!)

On investigation of the inner reaches of the monitor it became clear that what my Apple was displaying as the contents of each memory address (even though the magazine listing of input was faithfully there) was not entirely what is printed in the magazine. Certain anomalies arose, and these I have listed separately.

MED-RES GRAPHICS ANOMALIES

APPLE MNEMONIC		MAGAZINE MNEMONIC	
0A45	BCC	0A45	BLT
0A6B	BCC	0A6B	BLT
0A85	BCC	0A85	BLT
0ABB	BCC	0ABB	BLT
0B35	BCC	0B35	BLT
0B42	BCC	0B42	BLT
0BC7	see below		
0BCF	BCC	0BCF	BLT
0BD3	BCS	0BD3	BGE
0BEA	BCC	0BEA	BLT
0BEE	BCS	0BEE	BGE
0C24	???	0C24	ASC

The input for address 0BC7 was only partially visible; ie (90 D?). I entered the letter 'A' here (?) and got 0BC7 BCC while the listing says BLT.

As you can see at least the differences are consistent, even allowing for my guess!

This non-running of programs listed in magazines seems to be very common, so don't feel I'm getting at you! I would however appreciate a reply of some sort on this matter. – **A.M. Oldacre, Stourbridge.**

● The Apple mnemonic in your example is the standard 6502 processor mnemonic as published by Synertek. The other column is a listing by an assembler which enables you to construct the program more easily. There is no easy way to learn machine code – you are going to have to read more books on the subject. See page 60 of last month's Windfall for some suggestions on recommended reading. – **Max Parrott.**

Well invested

I am 13 years old. I own an Apple II with some games. When I read of the Apple Olympics game at Slough my father sent off for the Olympic Decathlon disc. At the event I came third and won the bronze medal.

Later I got a copy of Threshold and after a lot of practice I managed to reach the last screen three times in one game with a score of 600,400. In three different places I read that it was impossible to finish the last screen.

On Alien Typhoon I managed to last for three hours, reaching a score of 450,000 and I only stopped then because it was time for dinner. At the recent PCW show I got the high score at Jaw Breaker with 57,890 and won a camera on the SBD stall.

That proves that investing in an Apple is well worth it! Investing in Windfall has also saved us over £100 when buying a second disc drive from Timedata's advert in the September issue. – **David Johnston, Caerleon, Gwent.**

Character coding

THE atlas in "What's where in the Apple" contains many two character codes between backslashes. What do they mean? – **P.J. Colmer, Fordingbridge, Hampshire.**

● We think that these codes each carry

two meanings, where the first character designates Subroutine, Parameter, Buffer, Hardware and the second character designates Entry, Bytes, Label with a number after Parameter signifying the number of bytes used. We assume that FF stands for flip-flop.

Incidentally, the hi-res graphic subroutines have the wrong addresses; they are (with correct address in brackets):

HGR2, $F3D4 ($F3D8); HGR,$F3DE ($F3E2); HCLR, $F3EE ($F3F2); BKGND, $F3F2 ($F3F6); HPOSN, $F4OD ($F411); HPLOT, $F453 ($F457) and HLIN, $F530 ($F53A). – **Max Parrott.**

Plea for Hong Kong

I WOULD like to enquire if there are any programs written for very young children. I have been looking in the numerous advertisements but have seen none on offer. I would particularly like programs to teach spelling, and utilise a speech synthesiser and high resolution graphics. If anyone out there can help me I would be most grateful. – **Peter Ballard, Rise Park Villas, Lot 1124, D.D. 253, Razor Hill, Clearwater Bay Road, Hong Kong.**

Fraught first steps

WE are voluntary workers (old ladies and an old man) who want to get the best out of and to learn a little bit more about the Apple II. We feel that the follow up service and information available for beginner users of Apple is sadly lacking.

Much of the literature we have seen, apart from the scanty instructions in the manuals provided, makes us wonder if it is meant to be understood by someone of normal intelligence. This also applies to the editorials in many magazines.

I'm of the opinion that someone could make himself a millionaire overnight if he published a booklet, written in simplified, easy to understand terms, entitled "Get the most out of your computer."

Perhaps the people who wrote the existing manuals didn't take voluntary workers into account, wishing to keep programming and use of computers in the domain of a few experts who have been fully trained.

Incidentally, we own two Apple II Europlus with extra memory card – whatever that is – and use disc drives. – **Derek Mills, The National Music for the Blind, Southport.**

● There is no easy way to learn about computers or programming. The Applesoft manual stresses that you can't learn by reading, only by doing, and we agree. Try out as many programs, pieces of software, ideas and suggestions as possible, play with the Apple (whether you have a specific task or not), have a go at the seemingly complex and unintelligible and it will begin to make sense. The manuals, which you criticise, are as good a place as any to begin with – provided that you DO them, rather than just read them.

Another good starter, regardless of your age, is Kids & The Apple, written by E.H. Carlson, published by Datamost – and being reviewed in Windfall next month.

Accessories problems

COULD you please advise me on the following Apple accessories as I still don't quite understand how they work.

128k expansion cards are being advertised as being able to act as disc drives. Does this actually mean that, for example, all the data on say a stock control card or payroll is automatically loaded onto these expansion units so that a great deal of time is saved when the machine would normally be searching for various stock details or payroll records, and how safe are they?

On page 26 of the June issue, you mention a program called Apple Spool, available from Protocol Computer Products. It would seem that if the above items can be used as suggested in your magazine, then using my Tabs sales ledger/stock control programs, the Apple could be fast enough to use as an electronic till. Your comments would be appreciated.

Finally, is there a unit on the market to expand the number of available slots for expansion cards, as I already have five in use – for memory expansion, printer, 80 column, Tabs and two disc drives. – **David Gordon & Co, certified accountants, Southend.**

● Memory usage by a commercial program is sometimes restricted by the constraints imposed by the authors. The only way to ensure that full advantage is taken of a memory expansion card of the type you mention is to try it out on your system before purchase. Most dealers would be happy to assist in this respect as this is a fairly new product and any information gained would be mutually advantageous.

Some cards come with software which enables them to emulate a disc. However RAM card memory is volatile and so in the event of a power failure the data could be lost. There are products, such as Applejuice, which protect against the effect of a short-term mains failure.

Regarding the use of Apple Spool, the only way to find this out is to do it.

Printer cards are now available which give a combined serial and parallel output thus giving a "saving" of one slot.

What do you want? Information!

I AM not a number, I am a free man! Honest, I can escape from the Island and have really enjoyed playing The Prisoner, but I can't do what your reviewer Kes Smith took only an hour to do.

How do I get money out of my bank account? I obviously don't need money to escape, but it puzzles me all the same and I wouldn't mind a little hint. – **Geoff Scott, Guildford, Surrey.**

● Most of the Island's shopping facilities use an interest-free direct debit system, with no obvious way of replenishing your initial stake of 500 credits. (Have you discovered what happens to you if you go broke?)

The bank's instructions are deliberately inadequate, but by making a deposit, you effectively open a second account, from which you can later withdraw money. That money is then credited back to your main account. If the system is in a good mood it will let you withdraw more than you put in (Interesting?) – **Kes Smith.**

Statsease

A comprehensive set of interactive programs for teaching statistics and analysing data with the Apple microcomputer. The set is menudriven, and advises the user at each stage which statistical tests are appropriate, and why. The tests are then carried out and probabilities automatically given. The data are displayed graphically as histograms or scatter-diagrams. There are many routines for detecting and correcting errors.

The analyses, both parametric and non-parametric, include:

* Tests for contingency tables (chi-squared, Yate's, Fisher's, Haldane's).
* Tests for one or two groups (skewness, kurtosis, confidence limits, t-tests for equal and unequal variances, paired and unpaired data, U-test etc.).
* Tests for many groups (anova, Bartlett's individual comparison, Kruskal-Wallis, etc.).
* Correlation and regression (parametric and Spearman's, many useful options).
* Built-in "tables" of chi-squared, normal deviates, t, F, binomial and Poisson.
* Handling program for storage, amendment, addition or removal of data.

No knowledge of programming is needed. Students can "get the feel" of statistics by entering different kinds of data and almost immediately seeing the displays. Experimental results can be analysed thoroughly and speedily.

We believe that the programs, developed at the University of Nottingham, are easier to use, more comprehensive, and better value than any comparable alternative.

Disk with 7 programs and instruction sheets
£75.00 + V.A.T.

Back-up disk (if bought at the same time)
£ 5.00 + V.A.T.

Omnibus by Ray Meddis

ANALYSIS OF VARIANCE BY RANKS

OMNIBUS is an indispensible tool for the busy Statistician, offering evaluation of:

★ Differences among samples
★ Trends and Contrasts
★ Correlation and Concordance

Based on a unique, structured approach to non parametric testing, Omnibus frees the user from the confusing task of test selection.

Omnibus automatically performs the appropriate test(s) from:

★ Sign test
★ Wilcoxon matched pairs
★ Friedman
★ Cochran
★ Wilcoxon stratified
★ Mann-Whitney (Wilcoxon)
★ Kruskal-Wallis
★ Benard and van Elteren
★ Spearman's rank correlation
★ Kendall's concordance
★ Frequency tables 2×2, 2×q, k×q
★ Multiple frequency tables
★ Durbin's incomplete blocks
★ Page's trend
★ Post hoc pairwise comparisons

Omnibus can even cope with unequal sample (and cell) frequencies and empty cells. Trends and contrasts are computed for frequency tables too.
Requires — Apple II 48k. Disc drive.
Program complete with comprehensive manual—
£95.00 + VAT

LEICESTER
computer centre limited

67 Regent Road, Leicester LE1 6YF. Tel: 0533 556268

'make it easy on yourself'

80 COLUMN DISPLAY

Applewriter 2 compatible!

FOR YOUR APPLE

SPECIAL PROMOTION
NOVEMBER TO DECEMBER
only £120 (was £165)

The U-TERM adds an 80 column upper and lower case facility to your Apple compatible with BASIC, PASCAL, and CP/M and applications packages such as Applewriter 2, Wordstar, Financial Controller etc.

Available from Apple Dealers worldwide or direct from U-Microcomputers.

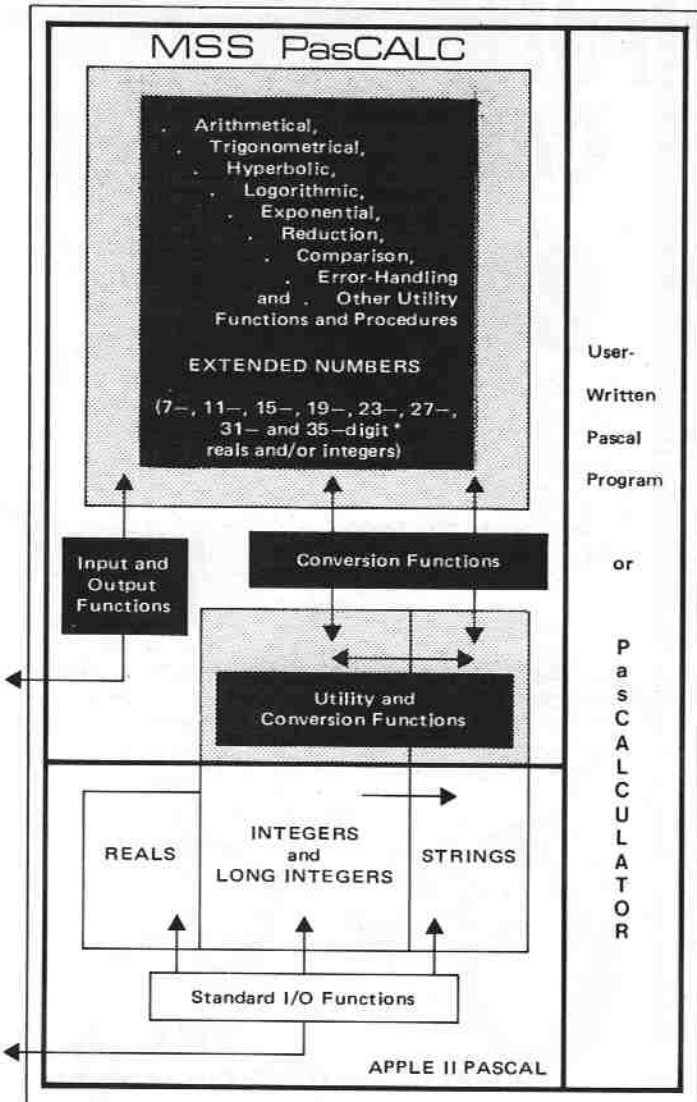
Prices do not include VAT or p. & p. (£1.00 per board)

U-Microcomputers Limited,
Winstanley Industrial Estate,
Long Lane, Warrington,
Cheshire, WA2 8PR, England.
Telephone: 0925 54117/8
Telex: 668920 U-ONE

U-MICROCOMPUTERS

a range of quality peripheral cards to enhance your Apple

We now make more Apple cards than Apple!



Logical Relationship between a User-Written Pascal Program, Apple Pascal and PasCALC.

To **MATHEMATICAL SOFTWARE SERVICES, FREEPOST, Guildford, Surrey, GU1 1BR.**

Find enclosed cheque/PO for £73.60 for one set of PasCALC and PasCALCULATOR software for precision levels 7, 11, 15, 19, 23, 27, 31 and 35.*

* Circle five precision levels unless you want the standard set (underlined)

. . . . . .

. . . . . .

. . . . . .

. . . . . .

Allow two weeks for delivery WIN 1

To order, write your name and address on the form, showing which 5 precision levels you want, and post it with a cheque or PO to Mathematical Software Services, FREEPOST, Guildford, Surrey, GU1 1BR. No stamp is needed on your letter.

Pascal is the most versatile high level language generally available for microcomputers today, and its popularity is steadily growing. Now, to enhance APPLE II Pascal 1.1, MSS (Mathematical Software Services) brings you

PasCALC

Enhancement in Depth

Extended Number TYPE gives a choice of precisions from 7 to 35 digits, and allows you to mix integers and reals in your Pascal calculations.

Enhancement in Function

More than 70 functions and procedures (see the diagram) for Extended Numbers, Pascal integers, long integers and strings.

- You choose precision at compile-time, so there is no need to re-program when you move from, say, a precision level of 11 digits to one of 23.
- A comprehensive error-handling procedure specially designed to handle your own run-time errors.
- PasCALC is distributed as a suite of Pascal-readable modules with detailed instructions for mounting it in the Pascal SYSTEM.LIBRARY.

PasCALC is written in Pascal, designed with the aim of making greater computational power available to general user and specialist alike. It requires a 48K APPLE II with at least one disk drive, and it can be used by any Pascal program – such as

PasCALCULATOR

which is distributed with PasCALC. PasCALCULATOR is a powerful interactive (conversational) command processor for doing calculations at the keyboard. Simply boot Pascal, exec PasCALC and away you go. For example, you can find (1/(S*SQT[2*P]))*EXP[-SQR[X-M]/(S^2*2)] in only one step!

- 26 names (A..Z) available for keeping intermediate values during the session.
- Ten commands can be RETAINed at any one time for later recall, saving time and reducing keying errors.
- Commands can be REPEATed too – ideal for observing convergence of a result.
- Full Extended Number 'mixed' arithmetic and range of precisions, with many built-in functions.
- Both parentheses (priority of calculation) and built-in functions [brackets] can be nested to any depth.
- Optionally printed session log—no need to write down results at the keyboard.
- Both e and π (to 35 digits) are automatically set up at the start of every session.

Extract from Optional Log (Precision Level 15)

```
   Enter command:
Y:=Y+P^(2*LOG[10-(5*E/4])
   0.936471836457736E0
   Enter command:
A:=0.125E1
   0.125000000000000E1
   Enter command:
X-SIN[P-EXP[A/(B+Y)]^D]
   -0.185890363973163E1
   Enter command:
RETAIN
   Retained as command 5
   Enter command:
A:=0.15E1
   0.150000000000000E1
   Enter command:
COMMAND5
   X-SIN[P-EXP[A/(B+Y)]^D]
   0.826354927584729E-1
   Enter command:
LISTV
   ----------------
   LIST OF VARIABLES
   ----------------
   A = 0.150000000000000E1
   B = 1
   D = 5
   E = 0.271828182845905E1
```

PasCALC and PasCALCULATOR: £64.00 plus £9.60 VAT or $144.00 including insured airmail delivery.
100-page User's Guide only: £12.00 ($20.00 airmail).

MATHEMATICAL SOFTWARE SERVICES

33 St Margarets, London Road, Guildford, Surrey GU1 1TL.

Guildford (0483) 69055

APPLE is a registered trade mark of Apple Computer Corporation, and PasCALC and PasCALCULATOR are trade marks of Mathematical Software Services. * Precision limited to 27 digits maximum for some real functions.

Ampersand routine to interface with Basic

By ED PEACH

LAST month we developed a generalised routine for drawing a hexagon on the screen. Now we will be looking at ways to use this for drawing other shapes and in addition utilising an ampersand routine to interface with Basic programs.

Newcomers to the Apple will be puzzled by the lack of documentation on the use of the ampersand in the Apple manual – see page 123 of your Applesoft manual. In fact the jump to $3F5 that the ampersand causes is a very useful way of getting into a fixed point in memory from Basic. I will not rehash the many articles which have shown how the ampersand can be used, but will instead refer readers to the following publications: "Nibble Express", an anthology of Nibble magazine and "Call Apple – All About Applesoft" These are a good source of information for the Apple machine code tyro.

Subroutine AMPER sets up a machine code routine to parse your Basic program after the '&' and interpret what you have commanded. For example, if we wanted to draw a disc coloured in the colour given by the variable CO, centre given by X and Y and radius R, we could put &C,CO,X,Y,R and obtain just that.

The Basic syntax for med-res shapes is given by the following:

Fill screen &F,CO
Horizontal line &H,CO,X,Y,L
Vertical line &V,CO,X,Y,L

Where CO is the colour, X,Y the starting coordinate and L the length.

In a similar manner:

Square &S,CO,X,Y,L
Circle &C,CO,X,Y,R

where CO is the colour once more, X,Y the midpoint of the shape, L the length of a side and R the radius.

The syntax for a triangle and quadrilateral are slightly different:

Triangle &T,CO,X1,Y1,X2,Y2,X3,Y3
Quadrilateral &Q,CO,X1,Y1,X2,Y2, X3,Y3,X4,Y4

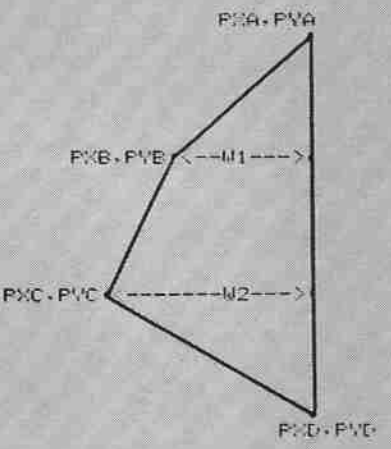
where CO is again the colour and X1,Y1, etc are the corner-point coordinates.

In the examples above any variable may be substituted for CO,X,Y,R,L,X1, Y1,X2,Y2,X3,Y3, and X4,Y4

Use of any letter other than the shape identifiers, ie &H,&V,&S,&C,&T,&Q, will result in a syntax error.

The routines which follow for a vertical line, horizontal line are simple variants on DLINE, while the routines for the triangle and square are simple variants of the routine to draw a quadrilateral.

The subroutine to draw a quadrilateral is in turn a special case of GENBLK subroutine, and most of the program consists of orientating the points into one of four classes, and calculating the width parallel to the X axis, eg.:



The routine to draw a circular disc is based on 'Doras' approximation, and as used here actually draws the top left quarter of the disc and then reflects this through the other sectors.

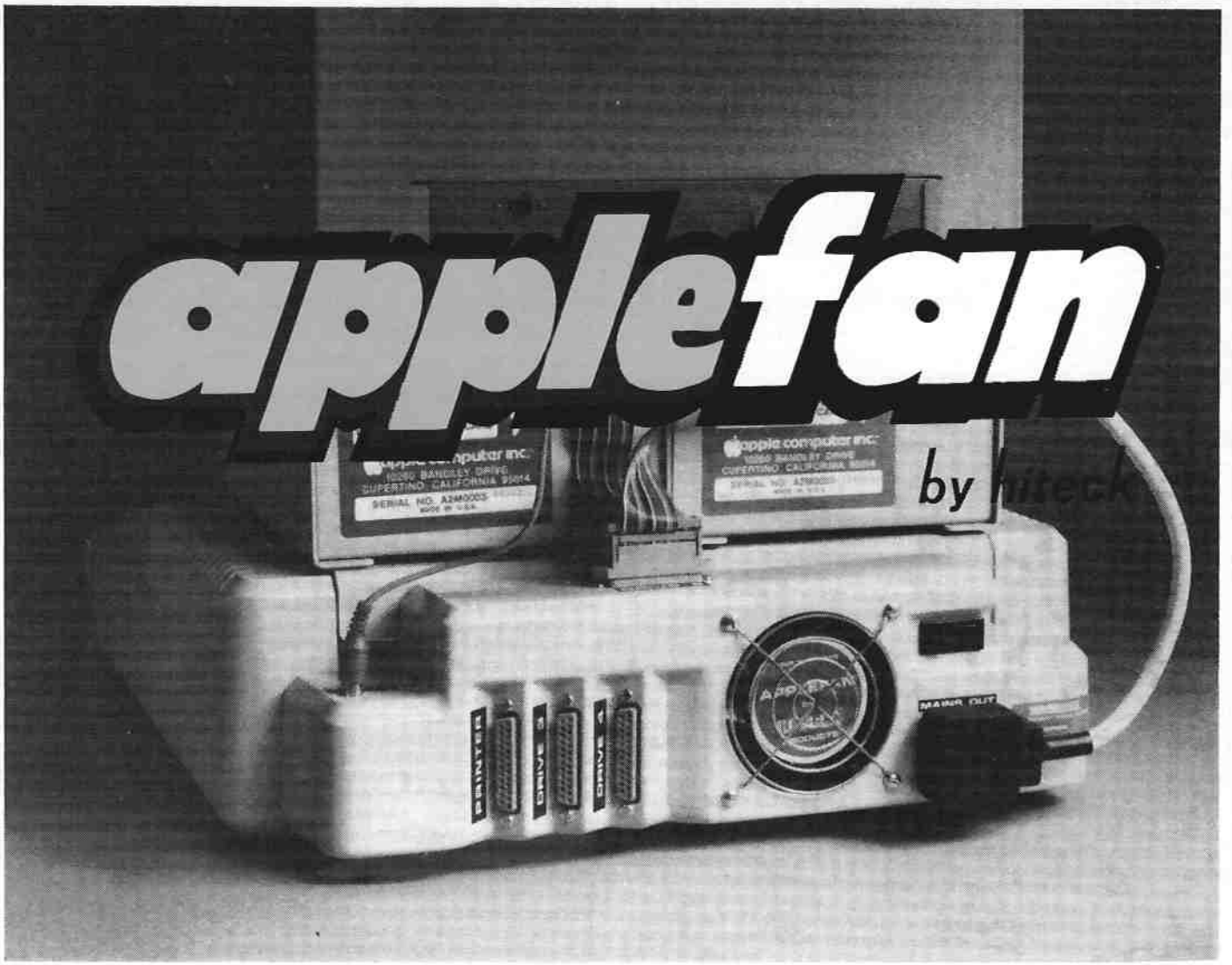
The final machine code routine, ZPAGE, saves some zero page as it enters the ampersand routine and restores the zero page to this state on exit. To use, set HGR, BRUN the machine code and POKE 103,1: POKE 104,64 POKE 16384,0, then run your routine.

```
                        ********************************
                        *      SUBROUTINE INITAMP      *
                        *  SET UP AMPER JUMP VECTORS   *
                        ********************************
03F5:                   HOOK    EQU  $3F5
0300:A9 4C              INITAMP LDA  #$4C       ;SETUP JUMP VECTOR
0302:8D F5 03                   STA  HOOK
0305:A9 FE                      LDA  #>AMPER
0307:8D F6 03                   STA  HOOK+1
030A:A9 0D                      LDA  #<AMPER
030C:8D F7 03                   STA  HOOK+2
030F:60                         RTS
                        ********************************
                        *      SUBROUTINE AMPER        *
                        *  ROUTINE TO PARSE BASIC      *
                        *  & STATEMENT AND JUMP TO     *
                        *  CORRECT ROUTINE             *
                        ********************************
00F4:                   ATEMP   DS   $A
00A2:                   SIIDE   EQU  $A2
030E:18                 AMPER   CLC
030F:D8                         CLD
0310:B8                         CLV
0311:48                         PHA                     ;SAVE ACCUMULATOR
0312:A9 20                      LDA  #$20       ;INITIALISE GRAPHICS
0314:85 E6                      STA  $E6
0316:68                         PLA                     ;GET BACK ACCUMULATOR
0317:C9 48                      CMP  #$48       ;FIRST CHARACTER AFTER & AN 'H'?
0319:F0 27                      BEQ  HAMP       ;YES
031B:C9 56                      CMP  #$56       ;OR A 'V'?
031D:F0 6F                      BEQ  VAMP       ;YES
031F:C9 51                      CMP  #$51       ;OR A 'Q',ETC.
0321:D0 03                      BNE  SCOMP
0323:4C C3 0E                   JMP  QAMP
0326:C9 53              SCOMP   CMP  #$53       ;'S'
0328:D0 03                      BNE  TCOMP
032A:4C 88 0E                   JMP  SAMP
032D:C9 54              TCOMP   CMP  #$54       ;'T'
032F:D0 03                      BNE  CCOMP
0331:4C D4 0E                   JMP  TAMP
0334:C9 43              CCOMP   CMP  #$43       ;'C'
0336:F0 6A                      BEQ  CAMP
0338:C9 46                      CMP  #$46       ;'F'
033A:D0 03                      BNE  SNRROR
033C:4C F1 0E                   JMP  FSCREEN
033F:20 96 E1           SNRROR  JSR  $E196      ;BAD SUBSCRIPT SYNTAX ERROR
0342:A2 03              HAMP    LDX  #$3
0344:20 7E 0F                   JSR  EVAL       ;EVALUATE PARAMETERS
0347:A2 03                      LDX  #$3        ;STORE DATA AWAY
0349:BD F4 0D                   LDA  ATEMP,X    ;GET COLOUR
034C:8D 02 08                   STA  PATTERN
034F:CA                         DEX
0350:BD F4 0D                   LDA  ATEMP,X    ;GET X COORD
0353:85 99                      STA  XPOS
0355:CA                         DEX
0356:BD F4 0D                   LDA  ATEMP,X    ;GET Y COORD
0359:85 9A                      STA  YPOS
035B:AD F4 0D                   LDA  ATEMP
035E:C9 7C                      CMP  #124
0360:90 18                      BLT  HLOK       ;LINE NOT TOO LONG
0362:A9 FE                      LDA  #$FE       ;IF SO DRAW IN TWO BITS
0364:85 FF                      STA  WIDTH
0366:20 B0 0A                   JSR  DLINE      ;DRAW LONG BIT
0369:A5 99                      LDA  XPOS       ;GET STARTING PLACE
036B:18                         CLC
036C:69 7C                      ADC  #124       ;ADJST
036E:C9 8C                      CMP  #140       ;DONT BOTHER IF TOO BIG
0370:B0 0F                      BGE  ZST
0372:85 99                      STA  XPOS       ;OTHERWISE FIND NEW XPOS
0374:AD F4 0D                   LDA  ATEMP
0377:38                         SEC             ;GET NEW WIDTH
0378:E9 8C                      SBC  #140       ;AND FALL  THROUGH
037A:18                 HLOK    CLC
```

MED-RES GRAPHICS

Part III

```
0E6B:2A          739          ROLA          ;MULT BY 2
0E6C:85 FF       740          STA  WIDTH
0E6E:20 B0 0A    741          JSR  DLINE    ;DRAW LINE
0E71:20 6B 13    742 ZST      JSR  ZPRSTR   ;PUT BACK ZERO PAGE
0E74:60          743          RTS
0E75:A2 03       744 TYPE4    LDX  #$3
0E77:20 7E 0F    745          JSR  EVAL     ;GET PARAMETERS
0E7A:20 A1 0E    746          JSR  CASSIN   ;STORE AWAY
0E7D:60          747          RTS
0E7E:20 75 0E    748 VAMP     JSR  TYPE4    ;VERTICAL LINE
0E81:20 5A 0F    749          JSR  VLINE
0E84:20 6B 13    750          JSR  ZPRSTR
0E87:60          751          RTS
0E88:20 75 0E    752 SAMP     JSR  TYPE4    ;SQUARE
0E8B:20 00 0F    753          JSR  SQUARE
0E8E:20 6B 13    754          JSR  ZPRSTR
0E91:60          755          RTS
0E92:A2 03       756 CAMP     LDX  #$3      ;CIRCLE
0E94:20 7E 0F    757          JSR  EVAL
0E97:20 A1 0E    758          JSR  CASSIN
0E9A:20 D2 11    759          JSR  CIRCLE
0E9D:20 6B 13    760          JSR  ZPRSTR
0EA0:60          761          RTS
0EA1:A2 03       762 CASSIN   LDX  #$3
0EA3:BD F4 0D    763          LDA  ATEMP,X
0EA6:8D 02 08    764          STA  PATTERN
0EA9:CA          765          DEX
0EAA:BD F4 0D    766          LDA  ATEMP,X
0EAD:85 99       767          STA  XPOS
0EAF:8D 9C 00    768          STA  XORG
0EB2:CA          769          DEX
0EB3:BD F4 0D    770          LDA  ATEMP,X
0EB6:85 9A       771          STA  YPOS
0EB8:8D 9D 00    772          STA  YORG
0EBB:CA          773          DEX
0EBC:BD F4 0D    774          LDA  ATEMP,X
0EBF:8D A2 00    775          STA  RADIUS
0EC2:60          776          RTS
0EC3:A2 08       777 GAMP     LDX  #$8
0EC5:20 7E 0F    778          JSR  EVAL
0EC8:A2 00       779          LDX  #$0
0ECA:20 A6 0F    780          JSR  REQ
0ECD:20 72 10    781          JSR  QUAD
0ED0:20 6B 13    782          JSR  ZPRSTR
0ED3:60          783          RTS
0ED4:A2 06       784 TAMP     LDX  #$6      ;TRIANGLE
0ED6:20 7E 0F    785          JSR  EVAL
0ED9:A2 00       786          LDX  #$0
0EDB:20 B4 0F    787          JSR  TRQ
0EDE:AD E9 0F    788          LDA  BLX
0EE1:8D EB 0F    789          STA  BRX
0EE4:AD EA 0F    790          LDA  BLY
0EE7:8D EC 0F    791          STA  BRY
0EEA:20 72 10    792          JSR  QUAD     ;A TRIANGLE IS A 3 SIDED QUADRILATERAL!
0EED:20 6B 13    793          JSR  ZPRSTR
0EF0:60          794          RTS
0EF1:A2 00       795 FSCREEN  LDX  #$0       ;FILL SCREEN
0EF3:20 7E 0F    796          JSR  EVAL     ;GET PARAMETER
0EF6:AD F4 0D    797          LDA  ATEMP
0EF9:8D 02 08    798          STA  PATTERN  ;COLOUR
0EFC:20 A4 0B    799          JSR  FILSCN
0EFF:60          800          RTS
0F00:A5 A2       801 SQUARE   LDA  SIDE     ;GET SIDE LENGTH
0F02:4A          802          LSRA ;DIVIDE  BY 2
0F03:85 9B       803          STA  TEMP1
0F05:A5 99       804          LDA  XPOS
0F07:18          805          CLC
0F08:65 9B       806          ADC  TEMP1
0F0A:20 46 0F    807          JSR  BXTST
0F0D:8D E7 0F    808          STA  TRX
0F10:8D EB 0F    809          STA  BRX      ;FIND TOP AND BOTTOM RIGHT X COORD
0F13:A5 99       810          LDA  XPOS
0F15:38          811          SEC
0F16:E5 9B       812          SBC  TEMP1
0F18:20 41 0F    813          JSR  STST
0F1B:8D E5 0F    814          STA  TLX      ;GET LEFTHAND X COORD
0F1E:8D E9 0F    815          STA  BLX
0F21:A5 9A       816          LDA  YPOS
0F23:18          817          CLC
0F24:65 9B       818          ADC  TEMP1    ;GET BOTTOM COORD
0F26:20 50 0F    819          JSR  BYTST
0F29:8D EA 0F    820          STA  BLY
0F2C:8D EC 0F    821          STA  BRY
0F2F:A5 9A       822          LDA  YPOS
0F31:38          823          SEC
0F32:E5 9B       824          SBC  TEMP1
0F34:20 41 0F    825          JSR  STST
0F37:8D E6 0F    826          STA  TLY      ;GET TOP COORD
0F3A:8D E8 0F    827          STA  TRY
0F3D:20 72 10    828          JSR  QUAD
0F40:60          829          RTS
0F41:B0 02       830 STST     BCS  SMOK
0F43:A9 00       831          LDA  #$0
0F45:60          832 SMOK     RTS
0F46:B0 04       833 BXTST    BCS  XOFL
0F48:C9 8C       834          CMP  #140
0F4A:90 03       835          BLT  XPOK
0F4C:18          836 XOFL     CLC
0F4D:A9 88       837          LDA  #139
0F4F:60          838 XPOK     RTS
0F50:B0 04       839 BYTST    BCS  YOFL
0F52:C9 60       840          CMP  #96
0F54:90 03       841          BLT  YPOK
0F56:18          842 YOFL     CLC
0F57:A9 5F       843          LDA  #95
0F59:60          844 YPOK     RTS
0F5A:A5 9A       845 VLINE    LDA  YPOS
0F5C:38          846          SEC
0F5D:E5 A2       847          SBC  SIDE
0F5F:85 A9       848          STA  MB
0F61:B0 04       849          BCS  VMORE
0F63:A9 00       850          LDA  #$0
0F65:85 A9       851          STA  MB       ;SIDE>YPOS
0F67:A9 04       852 VMORE    LDA  #$4
0F69:85 FF       853          STA  WIDTH
0F6B:20 B0 0A    854          JSR  DLINE    ;DRAW LINE SEGMENT
0F6E:A5 9A       855          LDA  YPOS
0F70:C9 00       856          CMP  #$0
0F72:F0 09       857          BEQ  VEND
0F74:38          858          SEC
0F75:E9 01       859          SBC  #1
0F77:85 9A       860          STA  YPOS
0F79:C5 A9       861          CMP  MB
0F7B:B0 EA       862          BGE  VMORE
0F7D:60          863 VEND     RTS
0F7E:8E 00 08    864 EVAL     STX  XBIT
0F81:20 B1 00    865          JSR  CHRGET   ;GET COMMA
0F84:20 B1 00    866 EAGIN    JSR  CHRGET   ;GET NEXT VARIABLE
0F87:20 E3 1F    867          JSR  NAPTR    ;GET VARIABLE ADDRESS
0F8A:20 F9 EA    868          JSR  COPYFAC  ;PUT VALUE IN MFP FAC
0F8D:20 52 E7    869          JSR  FINT     ;TURN INTO INTEGER
0F90:98          870          TYA           ;GET LOBIT
0F91:AE 00 08    871          LDX  XBIT
0F94:9D F4 0D    872          STA  ATEMP,X  ;AND STORE IT AWAY
0F97:E0 00       873          CPX  #$0      ;ALL DONE
0F99:F0 07       874          BEQ  EVEND    ;YES
0F9B:CA          875          DEX
0F9C:8E 00 08    876          STX  XBIT     ;UPDATE COUNTER
0F9F:4C 84 0F    877          JMP  EAGIN    ;DO IT AGAIN
0FA2:20 42 13    878 EVEND    JSR  ZPSAVE   ;SAVE SOME ZERO PAGE
0FA5:60          879          RTS
0FA6:AD F4 0D    880 REQ      LDA  ATEMP    ;NEED THIS ROUTINE AS
0FA9:8D EC 0F    881          STA  BRY      ;MFP SPACE USED INSIDE THIS
0FAC:E8          882          INX           ;PROGRAM
0FAD:BD F4 0D    883          LDA  ATEMP,X  ;AS IT IS ONE AREA WHICH
0FB0:8D EB 0F    884          STA  BRX      ;IS ALWAYS BEING CHANGED
0FB3:E8          885          INX
0FB4:BD F4 0D    886 TRQ      LDA  ATEMP,X
0FB7:8D EA 0F    887          STA  BLY
0FBA:E8          888          INX
0FBB:BD F4 0D    889          LDA  ATEMP,X
0FBE:8D E9 0F    890          STA  BLX
0FC1:E8          891          INX
0FC2:BD F4 0D    892          LDA  ATEMP,X
0FC5:8D E8 0F    893          STA  TRY
0FC8:E8          894          INX
0FC9:BD F4 0D    895          LDA  ATEMP,X
0FCC:8D E7 0F    896          STA  TRX
0FCF:E8          897          INX
0FD0:BD F4 0D    898          LDA  ATEMP,X
0FD3:8D E6 0F    899          STA  TLY
0FD6:E8          900          INX
0FD7:BD F4 0D    901          LDA  ATEMP,X
0FDA:8D E5 0F    902          STA  TLX
0FDD:E8          903          INX
0FDE:BD F4 0D    904          LDA  ATEMP,X
0FE1:8D 02 08    905          STA  PATTERN
0FE4:60          906          RTS
0FE5:            907 ;*********************************
0FE5:            908 ;     SUBROUTINE FTEST            *
0FE5:            909 ;     CHECK THAT BLOCK POINTS     *
0FE5:            910 ;     ARE CORRECTLY ORDERED       *
0FE5:            911 ;     IF NOT-REORDER THEM         *
0FE5:            912 ;*********************************
0FE5:            913
0FE5:            914 TLX      DS   $1
0FE6:            915 TLY      DS   $1
0FE7:            916 TRX      DS   $1
0FE8:            917 TRY      DS   $1
0FE9:            918 BLX      DS   $1
0FEA:            919 BLY      DS   $1
0FEB:            920 BRX      DS   $1
0FEC:            921 BRY      DS   $1
0FED:AD EA 0F    922 FTEST    LDA  BLY      ;GET BOTTOM LEFT COORDINATE
0FF0:CD E6 0F    923          CMP  TLY      ;TOP?
0FF3:B0 19       924          BGE  LOK      ;YES-OK
0FF5:48          925          PHA           ;SAVE BLY AND SWOP
0FF6:AD E6 0F    926          LDA  TLY      ; WITH TOP LEFT POINTS
0FF9:8D EA 0F    927          STA  BLY      ;
0FFC:68          928          PLA
0FFD:8D E6 0F    929          STA  TLY
1000:AD E9 0F    930          LDA  BLX
1003:48          931          PHA
1004:AD E5 0F    932          LDA  TLX
1007:8D E9 0F    933          STA  BLX
100A:68          934          PLA
100B:8D E5 0F    935          STA  TLX
100E:AD EC 0F    936 LOK      LDA  BRY      ;REPEAT FOR RHS
1011:CD E8 0F    937          CMP  TRY
1014:B0 19       938          BGE  ROK      ;ALL OK!
1016:48          939          PHA           ;CARRY ON SWOPPING
1017:AD E8 0F    940          LDA  TRY
101A:8D EC 0F    941          STA  BRY
101D:68          942          PLA
101E:8D E8 0F    943          STA  TRY
1021:AD EB 0F    944          LDA  BRX
1024:48          945          PHA
1025:AD E7 0F    946          LDA  TRX
1028:8D EB 0F    947          STA  BRX
102B:68          948          PLA
102C:8D E7 0F    949          STA  TRX
102F:AD EB 0F    950 ROK      LDA  BRX      ;CHECK RHS>LHS
```



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!

Manufactured by:

Hiteck Products

21 Station Road, Knebworth, Hertfordshire.
Telephone: 0438 812137.

Distributed by:

DE
Data Efficiency Ltd

Finway Road, Hemel Hempstead, Hertfordshire HP2 7PS.
Telephone: 0442 40571/2. Telex: 825554 DATEFF G.

PETE & PAM COMPUTERS

Waingate Lodge, Waingate Close, Rossendale, Lancs. BB4 7SO.
Telephone: 0706 227011.

'Apple' and 'Apple II' are Trade Marks of Apple Computers Inc. 'Applefan' is a Trade Mark of Hiteck Products.

MED-RES GRAPHICS

Part III

```
1032:CD E9 0F  951          CMP  BLX
1035:B0 19     952          BGE  BOK       ;OK!
1037:48        953          PHA            ;NO SO SWOP
1038:AD E9 0F  954          LDA  BLX
103B:8D EB 0F  955          STA  BRX
103E:68        956          PLA
103F:8D E9 0F  957          STA  BLX
1042:AD EC 0F  958          LDA  BRY
1045:48        959          PHA
1046:AD EA 0F  960          LDA  BLY
1049:8D EC 0F  961          STA  BRY
104C:68        962          PLA
104D:8D EA 0F  964          STA  BLY
1050:AD E7 0F  965 BOK      LDA  TRX       ;FINAL CHECK
1053:CD E5 0F  966          CMP  TLX
1056:B0 19     967          BGE  ETEST     ;ALL DONE
1058:48        968          PHA
1059:AD E5 0F  969          LDA  TLX
105C:8D E7 0F  970          STA  TRX
105F:68        971          PLA
1060:8D E5 0F  972          STA  TLX
1063:AD EB 0F  973          LDA  TRY
1066:48        974          PHA
1067:AD E6 0F  975          LDA  TLY
106A:8D EB 0F  976          STA  TRY
106D:68        977          PLA
106E:8D E6 0F  978          STA  TLY
1071:60        979 ETEST    RTS
1072:          981 ********************************
1072:          982 *      SUBROUTINE QUAD         *
1072:          983 *   FILLS IN A QUADRATIC       *
1072:          984 *   SHAPE BOUNDED BY X,Y       *
1072:          985 *   POINTS TL,TR,BL,BR AND     *
1072:          986 *   A COLOUR GIVEN BY PATTERN  *
1072:          987 ********************************
1072:20 ED 0F  988 QUAD     JSR  PTEST     ;MAKE SURE POINTS IN CORRECT ORDER
1075:AD EB 0F  989          LDA  TRY       ;GET TOP RHS Y COORD
1078:CD E6 0F  990          CMP  TLY       ;COMPARE WITH TOP LEFT
107B:90 03     991          BLT  BLGR
107D:4C 25 11  992          JMP  BIGL      ;LHS BIGGER
1080:85 9E     993 BLGR     STA  YA        ;PUT TRY WHERE INTPLTE CAN FIND
1082:8D 1B 0D  994          STA  PYA       ;AND WHERE GENBLK CAN FIND
1085:AD E7 0F  995          LDA  TRX       ;REPEAT FOR X COORD
1088:8D 17 0D  996          STA  PXA
108B:85 9C     997          STA  XA
108D:AD E6 0F  998          LDA  TLY       ;LOOK AT LHS Y COORD
1090:85 A4     999          STA  YPOINT    ;PUT WHERE INTPLTE CAN FIND
1092:8D 1A 0D 1000          STA  PYB       ;AND GENBLK
1095:AD E5 0F 1001          LDA  TLX       ;REPEAT FOR X COORD
1098:8D 19 0D 1002          STA  PXB
109B:AD EC 0F 1003          LDA  BRY       ;LOOK AT BOTTOM RHS
109E:85 9F    1004          STA  YB        ;USE IN INTPLTE
10A0:20 46 0C 1005          JSR  INTPLTE
10A3:38       1006          SEC
10A4:ED E5 0F 1007          SBC  TLX
10A7:10 05    1008          BPL  KW0
10A9:A9 FF    1009          LDA  #$FF
10AB:4C B0 10 1010          JMP  KW1
10AE:18       1011 KW0      CLC
10AF:2A       1012          ROLA
10B0:8D 1F 0D 1013 KW1      STA  W1        ;FIND FIRST WIDTH
10B3:AD EA 0F 1014          LDA  BLY       ;GET BOTTOM LHS
10B6:CD EC 0F 1015          CMP  BRY       ;TESTIT
10B9:B0 2E    1016          BGE  YBIG
10BB:8D 1C 0D 1017          STA  PYC       ;PUT IN GENBLK
10BE:85 A4    1018          STA  YPOINT    ;AND INTPLTE
10C0:AD E9 0F 1019          LDA  BLX       ;PUT LHS AWAY
10C3:8D 1B 0D 1020          STA  PXC
10C6:AD EC 0F 1021          LDA  BRY
10C9:8D 1E 0D 1022          STA  PYD
10CC:AD EB 0F 1023          LDA  BRX
10CF:8D 1D 0D 1024          STA  PXD       ;HAVING PUT POINTS AWAY
10D2:20 46 0C 1025          JSR  INTPLTE   ;INTERPOLATE
10D5:38       1026          SEC
10D6:ED E9 0F 1027          SBC  BLX
10D9:10 05    1028          BPL  KW4
10DB:A9 FF    1029          LDA  #$FF
10DD:8D E2 10 1030          STA  KW5
10E0:18       1031 KW4      CLC
10E1:2A       1032          ROLA
10E2:8D 20 0D 1033 KW5      STA  W2        ;AND FIND SECOND WIDTH PARALLEL TO Y
10E5:20 21 0D 1034          JSR  GENBLK    ;DRAW SHAPE
10E8:60       1035          RTS            ;FINISHED FIRST TYPES
10E9:8D 1E 0D 1036 YBIG     STA  PYD       ;PUT BLY AWAY
10EC:85 9F    1037          STA  YB        ;YA ALREADY DEFINED
10EE:AD E9 0F 1038          LDA  BLX       ;REPEAT FOR X
10F1:8D 1D 0D 1039          STA  PXD
10F4:85 9D    1040          STA  XB
10F6:AD E6 0F 1041          LDA  TLY       ;GET TOP LHS
10F9:85 9E    1042          STA  YA
10FB:AD E5 0F 1043          LDA  TLX
10FE:85 9C    1044          STA  XA
1100:AD EC 0F 1045          LDA  BRY
1103:85 A4    1046          STA  YPOINT    ;GET READY TO INTERPOLATE
1105:8D 1C 0D 1047          STA  PYC
1108:20 46 0C 1048          JSR  INTPLTE   ;INTERPOLATE FOR X COORD
110B:8D 1B 0D 1049          STA  PXC       ;PUT X COORD AWAY
110E:AD EB 0F 1050          LDA  BRX
1111:38       1051          SEC
1112:ED 1B 0D 1052          SBC  PXC
1115:10 05    1053          BPL  KW2
1117:A9 FF    1054          LDA  #$FF
1119:4C 1E 11 1055          JMP  KW3
111C:18       1056 KW2      CLC
111D:2A       1057          ROLA
111E:8D 20 0D 1058 KW3      STA  W2        ;FIND SECOND WIDTH PARALLEL TO Y
1121:20 21 0D 1059          JSR  GENBLK    ;DRAW SHAPE
1124:60       1060          RTS            ;FINISHED SECOND TYPES
1125:85 A4    1061 BIGL     STA  YPOINT    ;PUT TRY AWAY
1127:8D 1A 0D 1062          STA  PYB
112A:AD E6 0F 1063          LDA  TLY       ;GET LHS
112D:8D 1B 0D 1064          STA  PYA       ;AND PUT AWAY
1130:85 9E    1065          STA  YA
1132:AD E5 0F 1066          LDA  TLX       ;REPEAT FOR X
1135:8D 17 0D 1067          STA  PXA
1138:85 9C    1068          STA  XA
113A:AD EA 0F 1069          LDA  BLY       ;DO BOTTOM LEFT
113D:85 9F    1070          STA  YB
113F:AD E9 0F 1071          LDA  BLX
1142:85 9D    1072          STA  XB
1144:20 46 0C 1073          JSR  INTPLTE   ;INTERPOLATE
1147:8D 19 0D 1074          STA  PXB       ;PUT X AWAY
114A:AD E7 0F 1075          LDA  TRX
114D:38       1076          SEC
114E:ED 19 0D 1077          SBC  PXB
1151:10 05    1078          BPL  OKW0
1153:A9 FF    1079          LDA  #$FF
1155:4C 5A 11 1080          JMP  OKW1
1158:18       1081 OKW0     CLC
1159:2A       1082          ROLA
115A:8D 1F 0D 1083 OKW1     STA  W1        ;FIND FIRST WIDTH PARALLEL TO Y
115D:AD EA 0F 1084          LDA  BLY       ;GET BOTTOM LEFT AGAIN
1160:CD EC 0F 1085          CMP  BRY
1163:90 31    1086          BLT  RBIG      ;WHAT DOES REMAINDER OF SHAPE LOOK LIKE
1165:AD EC 0F 1087          LDA  BRY
1168:85 A4    1088          STA  YPOINT
116A:8D 1C 0D 1089          STA  PYC
116D:AD EA 0F 1090          LDA  BLY
1170:8D 1E 0D 1091          STA  PYD
1173:AD E9 0F 1092          LDA  BLX
1176:8D 1D 0D 1093          STA  PXD
1179:20 46 0C 1094          JSR  INTPLTE   ;INTERPOLATE FOR X
117C:8D 1B 0D 1095          STA  PXC       ;PUT AWAY
117F:AD EB 0F 1096          LDA  BRX
1182:38       1097          SEC
1183:ED 1B 0D 1098          SBC  PXC
1186:10 05    1099          BPL  OKW2
1188:A9 FF    1100          LDA  #$FF
118A:4C 9F 11 1101          JMP  OKW3
118D:18       1102 OKW2     CLC
118E:2A       1103          ROLA
118F:8D 20 0D 1104 OKW3     STA  W2        ;FIND SECOND WIDTH
1192:20 21 0D 1105          JSR  GENBLK    ;DRAW SHAPE
1195:60       1106          RTS            ;THIRD TYPE DONE
1196:85 A4    1107 RBIG     STA  YPOINT
1198:8D 1C 0D 1108          STA  PYC       ;PUT BLY AWAY
119B:AD E8 0F 1109          LDA  TRY
119E:85 9E    1110          STA  YA        ;HAVE TO CHANGE YA/YB ETC
11A0:AD E7 0F 1111          LDA  TRX
11A3:85 9C    1112          STA  XA
11A5:AD EC 0F 1113          LDA  BRY
11A8:85 9F    1114          STA  YB
11AA:8D 1E 0D 1115          STA  PYD
11AD:AD EB 0F 1116          LDA  BRX
11B0:85 9D    1117          STA  XB
11B2:8D 1D 0D 1118          STA  PXD
11B5:AD E9 0F 1119          LDA  BLX
11B8:8D 1B 0D 1120          STA  PXC
11BB:20 46 0C 1121          JSR  INTPLTE   ;INTERPOLATE
11BE:38       1122          SEC
11BF:ED E9 0F 1123          SBC  BLX
11C2:10 05    1124          BPL  OKW4
11C4:A9 FF    1125          LDA  #$FF
11C6:4C CB 11 1126          JMP  OKW5
11C9:18       1127 OKW4     CLC
11CA:2A       1128          ROLA
11CB:8D 20 0D 1129 OKW5     STA  W2        ;FIND SECOND WIDTH
11CE:20 21 0D 1130          JSR  GENBLK    ;DRAW SHAPE
11D1:60       1131          RTS            ;ALL DONE!
11D2:         1134 ********************************
11D2:         1135 *      SUBROUTINE CIRCLE       *
11D2:         1136 *   DRAWS A CIRCLE WITH        *
11D2:         1137 *   CENTRE XORIG,YORIG AND     *
11D2:         1138 *   RADIUS GIVEN BY RADIUS!    *
11D2:         1139 *   COLOUR GIVEN BY PATTERN    *
11D2:         1140 *   AS USUAL.                  *
11D2:         1141 *                              *
11D2:         1142 *   USES DORAS METHOD FOR      *
11D2:         1143 *   CIRCLES (MODIFIED)         *
11D2:         1144 ********************************
009C:         1145 XORG     EQU  $9C
009D:         1146 YORG     EQU  $9D
009E:         1147 XTEMP    EQU  $9E
009F:         1148 YTEMP    EQU  $9F
00A0:         1149 ESS      EQU  $A0
00A1:         1150 COUNT    EQU  $A1
00A2:         1151 RADIUS   EQU  $A2
11D2:AD A2 00 1152 CIRCLE   LDA  RADIUS    ;CHECK RADIUS NOT TOO BIG
11D5:C9 40    1153          CMP  #64
11D7:90 05    1154          BLT  RADOK
11D9:A9 3F    1155          LDA  #63
11DB:8D A2 00 1156          STA  RADIUS
11DE:85 9E    1157 RADOK    STA  XTEMP     ;ALSO <$80
11E0:85 A0    1158          STA  ESS       ;DITTO
11E2:A9 00    1159          LDA  #$00      ;INITIALISE
11E4:85 9F    1160          STA  YTEMP
11E6:A9 04    1161          LDA  #$04
11E8:85 A1    1162          STA  COUNT
11EA:A5 A1    1163 QLOOP    LDA  COUNT
```

MED-RES GRAPHICS

Part III

```
11EC:29 01     1164          AND  #$1      ;ODD OR EVEN
11EE:C9 01     1165          CMP  #$1
11F0:D0 4C     1166          BNE  P1160    ;EVEN COUNT NUMBERS
11F2:A5 9E     1167          LDA  XTEMP
11F4:18        1168          CLC
11F5:65 9E     1169          ADC  XTEMP
11F7:18        1170          CLC
11F8:65 A0     1171          ADC  ESS
11FA:85 A0     1172          STA  ESS
11FC:A5 9F     1173 P1080    LDA  YTEMP
11FE:10 05     1174          BPL  P1090
1200:F0 03     1175          BEQ  P1090
1202:4C 88 12  1176          JMP  P1250
1205:A5 A0     1177 P1090    LDA  ESS
1207:38        1178          SEC
1208:E5 9F     1179          SBC  YTEMP
120A:38        1180          SEC
120B:E5 9F     1181          SBC  YTEMP
120D:18        1182          CLC
120E:69 01     1183          ADC  #$1
1210:85 A0     1184          STA  ESS
1212:A5 9F     1185          LDA  YTEMP
1214:38        1186          SEC
1215:E9 01     1187          SBC  #$1
1217:85 9F     1188          STA  YTEMP
1219:A5 A0     1189          LDA  ESS
121B:30 03     1190          BMI  P1120
121D:4C 34 12  1191          JMP  P1140
1220:A5 9E     1192 P1120    LDA  XTEMP
1222:18        1193          CLC
1223:65 9E     1194          ADC  XTEMP
1225:18        1195          CLC
1226:69 02     1196          ADC  #$2
1228:18        1197          CLC
1229:65 A0     1198          ADC  ESS
122B:85 A0     1199          STA  ESS
122D:A5 9E     1200          LDA  XTEMP
122F:18        1201          CLC
1230:69 01     1202          ADC  #$1
1232:85 9E     1203          STA  XTEMP
1234:C5 9F     1204 P1140    CMP  YTEMP
1236:F0 03     1205          BEQ  P1150
1238:20 97 12  1206          JSR  P1270
123B:4C FC 11  1207 P1150    JMP  P1080
123E:A5 A0     1208 P1160    LDA  ESS
1240:38        1209          SEC
1241:E5 9E     1210          SBC  XTEMP
1243:38        1211          SEC
1244:E5 9E     1212          SBC  XTEMP
1246:85 A0     1213          STA  ESS
1248:A5 9F     1214 P1170    LDA  YTEMP
124A:38        1215          SEC
124B:E5 9E     1216          SBC  XTEMP
124D:30 02     1217          BMI  LTEST
124F:50 02     1218          BVC  TBIG
1251:50 05     1219 LTEST    BVC  P1180
1253:F0 03     1220 TBIG     BEQ  P1180
1255:4C 88 12  1221          JMP  P1250
1258:20 97 12  1222 P1180    JSR  P1270
125B:A5 9F     1223          LDA  YTEMP
125D:18        1224          CLC
125E:65 9F     1225          ADC  YTEMP
1260:18        1226          CLC
1261:69 01     1227          ADC  #$1
1263:18        1228          CLC
1264:65 A0     1229          ADC  ESS
1266:85 A0     1230          STA  ESS
1268:A5 9F     1231          LDA  YTEMP
126A:18        1232          CLC
126B:69 01     1233          ADC  #$1
126D:85 9F     1234          STA  YTEMP
126F:A5 A0     1235          LDA  ESS
1271:30 D5     1236          BMI  P1170
1273:38        1237          SEC
1274:E5 9E     1238          SBC  XTEMP
1276:38        1239          SEC
1277:E5 9E     1240          SBC  XTEMP
1279:18        1241          CLC
127A:69 02     1242          ADC  #$2
127C:85 A0     1243          STA  ESS
127E:A5 9E     1244          LDA  XTEMP
1280:38        1245          SEC
1281:E9 01     1246          SBC  #$1
1283:85 9E     1247          STA  XTEMP
1285:4C 48 12  1248          JMP  P1170
1288:A5 A1     1249 P1250    LDA  COUNT
128A:18        1250          CLC
128B:69 01     1251          ADC  #$1
128D:85 A1     1252          STA  COUNT
128F:C9 06     1253          CMP  #$6
1291:B0 03     1254          BGE  CDONE
1293:4C EA 11  1255          JMP  DLOOP
1296:60        1256 CDONE    RTS
1297:A5 A1     1257 P1270    LDA  COUNT    ;PLOTTING SUBROUTINE
1299:C9 05     1258          CMP  #$5
129B:F0 14     1259          BEQ  COUNT5
129D:AD 9D 00  1260          LDA  YORG
12A0:38        1261          SEC
12A1:E5 9F     1262          SBC  YTEMP
12A3:85 9A     1263          STA  YPOS
12A5:AD 9C 00  1264          LDA  XORG
12A8:38        1265          SEC
12A9:E5 9E     1266          SBC  XTEMP
12AB:85 99     1267          STA  XPOS
12AD:20 C5 12  1268          JSR  DISK
12B0:60        1269          RTS
12B1:AD 9D 00  1270 COUNT5   LDA  YORG
12B4:38        1271          SEC
12B5:E5 9E     1272          SBC  XTEMP
12B7:85 9A     1273          STA  YPOS
12B9:AD 9C 00  1274          LDA  XORG
12BC:38        1275          SEC
12BD:E5 9F     1276          SBC  YTEMP
12BF:85 99     1277          STA  XPOS
12C1:20 C5 12  1278          JSR  DISK
12C4:60        1279          RTS
12C5:A9 00     1280 DISK     LDA  #$0
12C7:8D F4 0D  1281          STA  ATEMP
12CA:A5 99     1282          LDA  XPOS     ;GET X COORD
12CC:C9 8C     1283          CMP  #140     ;IS IT ON SCREEN
12CE:90 0E     1284          BLT  CIRC1    ;YES
12D0:A9 00     1285          LDA  #$0
12D2:38        1286          SEC
12D3:E5 99     1287          SBC  XPOS
12D5:18        1288          CLC
12D6:4A        1289          LSRA
12D7:8D F4 0D  1290          STA  ATEMP
12DA:A9 00     1291          LDA  #$0      ;SO MAKE XPOS ZERO
12DC:85 99     1292          STA  XPOS
12DE:AD 9C 00  1293 CIRC1    LDA  XORG     ;FIND CENTRE
12E1:C5 99     1294          CMP  XPOS     ;SHOULD BE BIGGER
12E3:B0 01     1295          BGE  RDOK     ;YES IT IS
12E5:60        1296          RTS           ;IF NOT DONT PLOT
12E6:E5 99     1297 RDOK     SBC  XPOS     ;FIND CHORD LENGTH
12E8:18        1298          CLC           ;ADD ON ANY BIT WHICH OVERLAPPED
12E9:6D F4 0D  1299          ADC  ATEMP    ;THE ZERO AXIS
12EC:2A        1300          ROLA          ;MULT BY 2 FOR CHORD
12ED:2A        1301          ROLA          ;AND AGAIN FOR BIT WIDTH
12EE:85 FF     1302          STA  WIDTH
12F0:8D F4 0D  1303          STA  ATEMP
12F3:20 B0 0A  1304          JSR  DLINE    ;DRAW CHORD
12F6:AD F4 0D  1305          LDA  ATEMP
12F9:85 FF     1306          STA  WIDTH
12FB:A5 9A     1307          LDA  YPOS
12FD:C9 60     1308          CMP  #96
12FF:B0 10     1309          BGE  YCPOS
1301:AD 9D 00  1310          LDA  YORG
1304:38        1311          SEC
1305:E5 9A     1312          SBC  YPOS
1307:18        1313          CLC
1308:6D 9D 00  1314          ADC  YORG
130B:85 9A     1315          STA  YPOS
130D:20 B0 0A  1316          JSR  DLINE
1310:60        1317          RTS           ;ALL DONE
1311:A9 00     1318 YCPOS    LDA  #$00
1313:38        1319          SEC
1314:E5 9A     1320          SBC  YPOS
1316:18        1321          CLC
1317:6D 9D 00  1322          ADC  YORG
131A:6D 9D 00  1323          ADC  YORG
131D:85 9A     1324          STA  YPOS
131F:20 B0 0A  1325          JSR  DLINE
1322:60        1326          RTS

1323:          1328 ****************************
1323:          1329 *      SUBROUTINE ZPSAVE     *
1323:          1330 *      SAVES SOME ZERO PAGE  *
1323:          1331 ****************************
1323:          1332 ZRSV     DS   $3
1326:          1333 ZPSV     DS   $1C
1342:8D 23 13  1334 ZPSAVE   STA  ZRSV     ;SAVE REGISTERS
1345:8C 24 13  1335          STY  ZRSV+1
1348:8E 25 13  1336          STX  ZRSV+2
134B:A0 00     1337          LDY  #$0
134D:A2 00     1338          LDX  #$0
134F:B5 98     1339 MSV1     LDA  XBYTE,X
1351:99 26 13  1340          STA  ZPSV,Y
1354:C8        1341          INY
1355:E8        1342          INX
1356:E0 12     1343          CPX  #$12
1358:90 F5     1344          BLT  MSV1
135A:A2 00     1345          LDX  #$0
135C:B5 F6     1346 MSV2     LDA  LBADD,X
135E:99 26 13  1347          STA  ZPSV,Y
1361:C8        1348          INY
1362:E8        1349          INX
1363:E0 0A     1350          CPX  #$A
1365:90 F5     1351          BLT  MSV2
1367:AD 23 13  1352          LDA  ZRSV
136A:60        1353          RTS
136B:A0 00     1354 ZPRSTR   LDY  #$0      ;PUT ZERO PAGE BACK
136D:A2 00     1355          LDX  #$0
136F:B9 26 13  1356 RTSTR1   LDA  ZPSV,Y
1372:95 98     1357          STA  XBYTE,X
1374:C8        1358          INY
1375:E8        1359          INX
1376:E0 12     1360          CPX  #$12
1378:90 F5     1361          BLT  RTSTR1
137A:A2 00     1362          LDX  #$0
137C:B9 26 13  1363 RSTR2    LDA  ZPSV,Y
137F:95 F6     1364          STA  LBADD,X
1381:C8        1365          INY
1382:E8        1366          INX
1383:E0 0A     1367          CPX  #$A
1385:90 F5     1368          BLT  RSTR2
1387:AD 23 13  1369          LDA  ZRSV
138A:AC 24 13  1370          LDY  ZRSV+1
138D:AE 25 13  1371          LDX  ZRSV+2
1390:60        1372          RTS

*** SUCCESSFUL ASSEMBLY: NO ERRORS
```

C/WP MAKES LIFE EASY WITH APPLE.

It's not just your pocket we guard at C/WP with our APPLE prices that turn others green. We try to make your APPLE work better for you.

Ever cursed that Apple keyboard? Longed for a few more keys? Well, C/WP is providing them. Now you can buy C/WP MANUAL II, an extra row of 17 keys for your APPLE II that nestles snugly above the main keyboard. You'll find them easy and convenient to use whether you are a super touch-typist or a one-fingered wizard.

C/WP MANUAL II comes ready-programmed with 32 separate functions for Wordstar or Visicalc for £89 plus VAT. For Visicalc, MANUAL II gives you absolute cursor control. Or, for £30 plus VAT MORE, we will custom-build a MANUAL II for you with 32 functions of your own, each with up to 64 characters.

Or if you really believe in ringing the changes, there is the C/WP PROGRAMMABLE MANUAL II which can be programmed in a minute from the keyboard. The 16 keys each produce up to 128 characters. The keys retain their memory when your APPLE is switched off, but can be changed as often as you like. The price is £129 plus VAT.

Write or telephone now for full details of C/WP MANUAL II and for C/WP's exciting new Autumn Apple price list.

C/WP PRICES STILL TURN OTHERS GREEN

C/WP

C/WP Computers
108 Rochester Row, London SW1P 1JP
Telephone: 01-630 7444

MED-RES GRAPHICS

Part III

```
10  HGR
20  POKE  - 16302,0
30 A1 = 110:B1 = 5:A2 = 135:B2 = 15:A3 = 105:B3 = 24:A4 = 130:B4 = 30
40 SX = 20:SV = 60:SR = 10:CO = 119
50 TC = 215:X1 = 60:Y1 = 40:X2 = 40:Y2 = 70:X3 = 70:Y3 = 65:FC = 119:X =
    70:Y = 40:R = 18
60  & F,FC
70  FOR SZ = 1 TO 20
80 NO = FC
90  & C,CO,X,Y,R
100  & T,TC,X1,Y1,X2,Y2,X3,Y3:CO =  RND (0) * 255: & 0,CO,A1,B1,A2,B2,A3
    ,B3,A4,B4
110 SC = 255 - CO:SR =  RND (0) * 80:SX = 140 - X: IF SX < 0 THEN SX = 0

120 SV = 80 - Y: IF SV < 0 THEN SV = 0
130  & S,SC,SX,SV,SR
140  & C,NO,X,Y,R
150  & S,NO,SX,SV,SR
160 Y = Y +  RND (1) * 5 -  RND (1) * 5: IF Y < 0 THEN Y = 0
170  IF Y > 80 THEN Y = 79
180 X = X +  RND (1) * 10 -  RND (1) * 10: IF X < 0 THEN X = 0
190  IF X > 138 THEN X = 138
200 R =  RND (1) * 54 + 10
210  NEXT SZ
220 FC = FC + 103: IF FC > 300 THEN FC = 119
230 NO = FC: GOTO 60
240  END
999  REM  NOTE THE SETTING OF HGR AND TEXT IN EXEC PROGRAM, AND READ REM
     IN EXEC PROGRAM.
1000  REM  LINE 30 THROUGH 50, INITIALISE VARIABLE VALUES.
1001  REM  LINE 60.SET SCREEN TO COLOUR GIVEN BY 'FC'
1002  REM  LINE 70. SET UP A LOOP TO DEMONSTRATE EFFECT OF DIFFERENT BAC
    KGROUNDS.
1003  REM  LINE 80. SET UP 'NULL COLOUR TO BE SAME AS BACKGROUND.
1004  REM  LINE 90. DRAW A CIRCLE, COLOUR CO,CENTRE X,Y AND RADIUS R
1005  REM  LINE 100. DRAW A TRIANGLE WITH COLOUR TC, AND CORNERS GIVEN B
    Y X1,Y1 ETC.THEN DRAW A QUADRILATERAL COLOUR CO, AND CORNERS A1,B1 E
    TC.
1006  REM  LINE 110. RANDOMISE COLOURS AND POSITIONS.
1007  REM  LINE 130. DRAW A SQUARE, COLOUR SC, MIDPOINT SX,SV AND LENGTH
     OF SIDE SR
1008  REM  LINE 140 ERASE THE CIRCLE
1009  REM  LINE 150 ERASE THE SQUARE
1010  REM  LINES 160 THROUGH 200. RANDOMISE COORDINATES AND RADIUS OF CI
    RCLE.
1011  REM  LINES 220 THROUGH 230 CHANGE BACKGROUND COLOUR.
```

```
5 D$ =  CHR$ (4)
10  PRINT D$;"OPEN MED-RES EXEC"
20  PRINT D$;"WRITE MED-RES EXEC"
30  PRINT "POKE 103,0:POKE 104,64"
40  PRINT "BRUN MED-RES.OBJ0,A$800"
49  REM  SOMETIMES GET A SPURIOUS SYNTAX ERROR IF HGR NOT GIVEN FROM KEY
    BOARD OR EQUIVALENT.THIS USUALLY OCCURS AFTER RUNNING THE DOS 3.3 TO
    OLKIT
50  PRINT "HGR:TEXT:HGR"
60  PRINT "RUN MED-RES DEMO"
70  PRINT "PRINT D$;"CLOSEMED - RESEXEC"
```

GOODBYE TO FLOPPIES C/WP INTRODUCES A HARD DISC FOR £995.

C/WP have done it again. We proudly announce the C/WP CONTOUR, a range of British-made high technology 5-inch Winchester discs at prices starting below £1000.

Suddenly your micro-computer has come of age. One little box, not much larger than a floppy disc drive, stores up to 21 million characters. That size costs £1995 and stores the equivalent of more than 160 floppy discs, or 35 full-length books. And in a maximum of around a fifth of a second the C/WP CONTOUR finds any piece of information your computer asks for.

C/WP CONTOUR is available now for your APPLE II, Pet, IBM Personal, Sirius, Superbrain and many other CP/M and S100 machines. On APPLE the C/WP CONTOUR supports DOS 3.3, Pascal and CP/M operating systems.

Write or telephone for full details of this great price breakthrough. Now you can afford the luxury of a Winchester.

C/WP CONTOUR PRICE LIST	
3Mb (formatted)	£995
6Mb (formatted)	£1195
12Mb (formatted)	£1595
21Mb (formatted)	£1995
Tape streamer back-up (21Mb 4min)	£1495
All prices exclude VAT	

C/WP FOR BIG VALUE IN HARD DISCS

C/WP

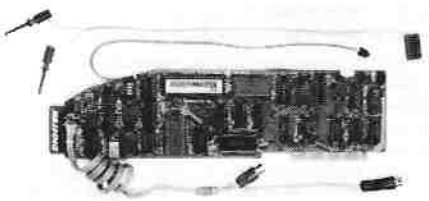
C/WP Computers
108 Rochester Row, London SW1P 1JP
Telephone: 01-630 7444

LOOK! . . . A NEW NAME IN apple ACCESSORIES

- All items fully guaranteed for one year
- Free postage and packing on all orders
- Immediate delivery
- Many more items available

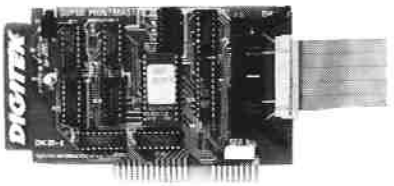
BUSINESS SOFTWARE	NET	INC. VAT
Calcstar (CP/M) (80 column spread sheet)	59.00	67.85
dBase II (CP/M)	349.00	401.35
Data Factory 5.0 (many new features)	157.00	180.55
Data Star (CP/M)	122.00	140.30
D.B. Master (version 3.02)	119.00	136.85
D.B. Master statistics	58.00	66.70
D.B. Master utilities (links with visi's)	58.00	66.70
Desk Top Plan II	122.00	140.30
Graphmagic (bar graphs, pie charts, etc)	47.00	54.05
Mathemagic	47.00	54.05
PFS Filing system (new improved)	68.00	78.20
PFS Graph	68.00	78.20
PFS Report	53.00	60.95
Supersort (CP/M)	75.00	86.25
Versaform (form generator in Pascal)	199.00	228.85
Visicalc (new version)	105.00	120.75
Visicalc expander (use with 32K/128K cards)	53.00	60.95
Visicalc utilities	34.00	39.10
Visidex	122.00	140.30
Visifile	132.00	151.80
Visipac (calc/trend/file)	378.00	434.70
Visiplot	99.00	113.85
Visischedule	155.00	178.25
Visiterm	59.00	67.85
Visitrend/plot	155.00	178.25
WORD PROCESSING		
Apple Speller (very fast proof reading)	45.00	51.75
Apple Writer II	72.00	82.80
Form Letter (use with Super Text II)	58.00	66.70
Format 80	275.00	316.25
Letter Perfect	87.00	100.05
Mailmerge (CP/M)	55.00	63.25
Pie Writer (40/80 columns)	78.00	89.70
Screenwriter II (70 col w/out 80 col card)	62.50	71.88
Super Text II	79.00	90.85
Wordstar 3.01 (CP/M) (enhanced features)	135.00	155.25
Zardax	139.00	159.85
GAMES		
Beer Run (Sirius)	16.95	19.49
Cannonball Blitz (Online Systems)	16.95	19.49
Choplifter (Broderbund)	16.95	19.49
Epoch (Sirius)	16.95	19.49
Flight Simulator (Sublogic)	16.95	19.49
Knights of Diamond (use with Wizardry)	18.95	21.79
Laff Pak (Online Systems)	16.95	19.49
Minotaur (Sirius)	16.95	19.49
Pinball (Sublogic)	16.95	19.49
Pool 1.5 (Innovative design)	16.95	19.49
Swashbuckler (Datamost)	16.95	19.49
Tawala's Last Redoubt (broderbund)	16.95	19.49
The Prisoner (Edu-Ware)	14.95	17.19
Threshold (Online Systems)	16.95	19.49
Time Zone (Online Systems)	43.75	50.31
Wizardry (Sir Tech Software)	24.95	28.69
Zork II (Infocom)	21.95	25.24
PRINTERS		
Diablo 630 (R/D)	1295.00	1489.25
Epson MX80T-3 (up to 132 col & hi-res)	299.00	343.85
Epson MX80FT-3 (as above & friction drive)	329.00	378.35
Epson MX82FT (very hi-res graphics)	359.00	412.85
Epson Mx100FT-3 (100 cps & wide carriage)	429.00	493.35
Mannesman Tally MT 120 (160 cps)	365.00	419.75
Nec 8023 (100 cps & prop. spacing)	319.00	366.85
Silentype & interface	159.00	182.85
Smith Corona TP-I (daisywheel printer)	429.00	493.35
Tec Starwriter FP1500 (25 cps)	650.00	747.50
PRINTER INTERFACE CARDS		
CPS Multifunction Card (inc real time clock)	119.00	136.85
Digitek Printmaster (BASIC/CPM/PASCAL)	69.00	79.35
Digitek Printmaster III with memory mang.	159.00	182.85
Grappler graphics (Epson/Anadex/Cen/P.tig)	98.00	112.70
MBP-16K (Epson 16K buffer)	96.00	110.40
Wizard 16K Buffer & graphics interface	149.00	171.35
80 COLUMN CARDS		
Digitek Screenmaster 80	185.00	212.75
Smarterm (very cool running, many features)	182.00	209.30
U-Term (inc shift mod. & font editor)	129.00	148.35
Videx Enhancer II	83.00	95.45
Videx Softswitch (40/80)	19.95	22.94
Videx Utility Disc (inc font editor etc)	24.45	28.12
Videx Videoterm	163.00	187.45
Visicalc preboot disc (80 col with videx)	32.00	36.80
Vision-80	185.00	212.75
MONITORS/COLOUR CARDS		
Digitek Colour Card (excellent colour on TV)	95.00	109.25
Microvitec colour monitor	264.00	303.60
Microvitec colour card (use with above)	35.00	40.25
Sanyo 12" Green Screen	105.00	120.75
Zenith 12" Green Screen (very good value)	89.00	102.35
GRAPHIC UTILITIES & MUSIC		
3-D Supergraphics	23.00	26.45
Arcade Machine (game designer)	21.45	24.67
Artist Designer	33.00	37.95
Digisolve Card (512 x 512 & 64k Ram)	375.00	431.25
E-Z Draw 3.3 (excellent graphic utility)	25.95	29.84
Graforth (fast 3D utility plus music)	43.00	49.45
Graphic package Sublogic (detailed 3D pack)	64.45	74.12
Higher Text II (many diff fonts, sizes, cols)	21.95	25.24
Pascal Animation	34.00	39.10
Pilot Animation Tools	34.00	39.10
Versawriter (graphic digitiser)	165.00	189.75
Zoom Grafix (zoom in on hi-res screen)	23.95	27.54
All Music System (9 voice)	85.00	97.75
Electric Duet (creates 2 part music)	18.95	21.79
Music Machine 9 Voice (Vista)	79.00	90.85
Music System (Mountain Computer 16 voice)	211.00	242.65
Mutek Vox Box	61.00	70.15
Zapple Sound Effects & Music Board	56.00	64.40
UTILITIES		
Ace (Applesoft Command Editor)	21.95	25.24
Aplus (Applesoft structured Basic)	18.95	21.79
Assembly lang. Dev. (6502, Z80 or 8080)	75.00	86.25
Bag of Tricks	20.45	23.52
Back It up II+ (bit copier)	48.00	55.20
B.E.S.T. (Enhanced Software Tool)	23.95	27.54
Build Using (Provides 'print using' command)	23.95	27.54
Dakin 5 (12 utility programs)	47.00	54.05
Disc Library (inc. CP/M & Pascal)	33.95	39.04
Dos 3.3 Tool Kit	39.00	44.85
Edit Soft (powerful macro line editor)	18.95	21.79
Fast DOS	19.45	22.37
Global Program Line Editor (supports 80 col)	34.50	39.68
Image Printer Epson (flexible hi-res dump)	24.95	28.69
Lisa (Assembly lang. dev. system)	55.00	63.25
Lisa (Educational system)	70.00	80.50
List Master (inc. smart renumbering)	23.95	27.54
Locksmith 4.1 (bit copier for most discs)	61.00	70.15
Merlin Macro Assembler (editor & utilities)	42.00	48.30

THREE NEW REVOLUTIONARY CARDS FROM DIGITEK



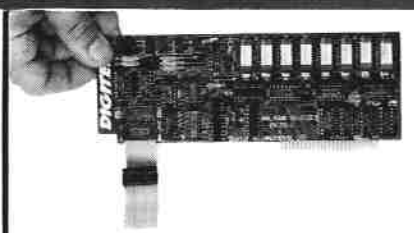
SCREENMASTER 80

This new 80 column card is the most advanced available with features like: 9x10 matrix, 3 scrolling speeds, shift lock, user definable graphics, supports all Applesoft commands and Applewriter II. Well worth the £185 + VAT.



SUPER PRINTMASTER III & BUFFER MANAGEMENT

A totally new concept in printer cards, supporting both colour & B/W printers. It incorporates a unique buffering facility using Ram cards. Up to 16 x normal size graphics dump and pic rotation etc. Prices: £159 (B/W) or £179 (Colour) + VAT.



64k & 128k RAM-MASTER

These cards use the latest low power D RAM chips and can be used for high speed disc emulation in Basic, CP/M or Pascal. VisiCalc Expand software available, can also be used printer buffer with Super Printmaster III. Prices 64k £213 or 128k £319 + VAT.

SMITH CORONA TP-I DAISYWHEEL PRINTER

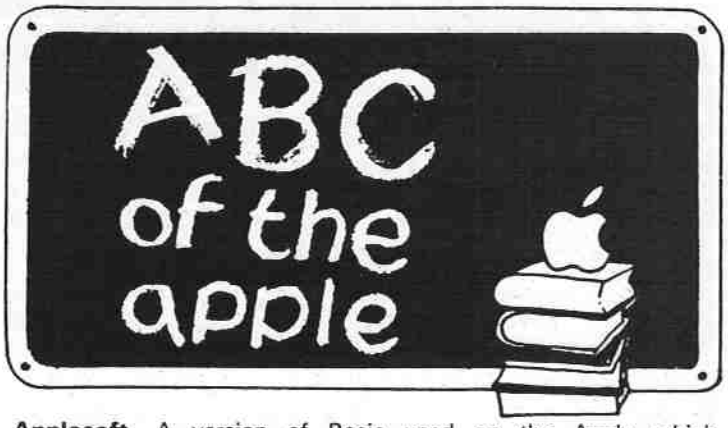
A microprocessor controlled high quality printer which delivers fully formed executive print at a speed of 120 words/min. Price £429 + VAT.

MICROVITEC 14" COLOUR MONITOR

Besides offering a crystal clear display in either text, hi-res or low-res modes. It also includes the following features, 16 text colours, b/grd colours, 80 column card compatibility. A superb colour monitor for £264 + VAT.

12" PRINCE MONITOR

Features 24 M/Hz bandwidth, giving a very clear display, and contained in a neat Apple compatible case, available with either Green or Amber screen. Well priced at £105 + VAT.



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.

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 – 1064 – 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.

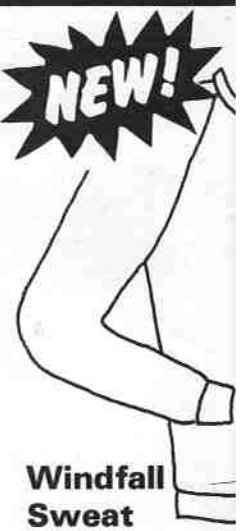
Visual Display Unit. Any screen which is used to display the current operating status of a microcomputer.

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.

Catch up on the articles you missed by sending for earlier issues. And when your collection is complete, keep it in one of our attractive binders. You can order by mailing the coupon on the right – or by phoning 061-456 8353 and quoting your credit card number.

July 1981
MicroModeller: crystal ball of the 80s? – Surround game (listing) – Bach and the Byte (review of Mountain Hardware's music system) – Apple programs that help the handicapped – Computers in primary schools – Why psychologists plump for the Apple – Use of Apple's unique EXEC files – Format 80 word processor review – The man behind Apple's UK success story – Analysis of CIS Cobol and its flexible file handling facilities. PLUS two pages of Compucopia and 11 Appletips.

August 1981
Networking systems (Constellation, Cluster One, Omninet) – Date validation routine – The Limits of My World (mathematical languages) – Textmaster WP review – Getting started with machine code – Running a preparatory school on an Apple – Software swop shop – Synthesiser as teaching aid – Integer to Applesoft Basic conversion – Apple machine language review – Apple user profile: Hill Samuel – The Market for MicroModeller. PLUS two pages of Compucopia and five Appletips.



Windfall Sweat Shirts
ONLY
£6.29

September 1981
Consumers' guide to Apple music, Part I – Games review (Starmines, Creature Venture, Hi-res Soccer) – Ski-run game (listing) – Speed restrictions with variables – Non-linear curve fitting – Machine code techniques, Part II (text insertion) – Crash course in Basic, Part I – Dot matrix printer review – Apples in networks (modems, Prestel) – CAL explosion coming – Computer games for physically handicapped – Apple user profile: SEGAS. PLUS three pages of Compucopia and five Appletips.

October 1981
Micro Planner review – Games review (Computer Bismark, Battle of Waterlook, Raster Blaster) – Letter square puzzle – Machine code techniques, Part III (dumping screens to printers) – Bulletin boards and personal computer database systems – Teletype terminal program – Crash course in Basic, Part II – Consumer's guide to Apple Music, Part II – Apple user profile: SEGAS, Part II – Apples in South African schools – Programs for primary schools. PLUS two pages of Compucopia and four Appletips.

November 1981
First review of the new Apple III – Games review (Temple of Apshai, Hellfire Warrior, Apple Panic) – Hayden Compiler review – BCPL, a fast language for the Apple – Psychological assessment by the Apple – Beneath Apple DOS book review – New software from the USA – Crash course in Basic, Part III – The role of speech synthesisers in schools – Historical review of computer literacy – Apple user profile: clothing manufacturing. PLUS three pages of Compucopia and six Appletips.

December 1981
Regain Step/Trace in Autostart Apples – Games listings (Apple Casino, Avoid, Calendar) – Games review (German Whist, Wizardry, Galactic Attack, Pool 1.5,) – Sinta Shape Manager review – Machine code techniques, Part IV (sorting arrays) – A/D converter review – Colour systems – Financial Controller review – Wordstar review – Crash course in Basic, Part IV – Debugging the Fortran Compiler – Care of discs – Electronic atlas – Pascal explored. PLUS four pages of Compucopia and seven Appletips.

January 1982
Apple scoop on Tomorrow's World – 1982: The Year of the Apple? – Games review (Wizardry) – Simultaneous equations without tears – Boosting machine code technique – Program Writer/Reporter review – Crash course in Basic, Part V – Machine code techniques, Part V (flagged bubble sorts) – Apple graphics, Part I (Apple's memory map) – Orbit accounting system review – Cost effective terminal computer – Moving hi-res graphics. PLUS four pages of Compucopia and seven Appletips.

February 1982
Games review (Olympic Decathlon, Dragons Eye) – CP/M: passport to exciting new world – Pascal file conversion program – Machine code techniques, Part VI (EVALuate a new function) – Crash course in Basic, Part VI – Elements of the Apple, Part I – Apple Graphics, Part II (high resolution graph drawing) – Making programs more user friendly – Getting round the memory map muddle – Apple user profile: Sea Fish Authority. PLUS three pages of Compucopia and seven Appletips.

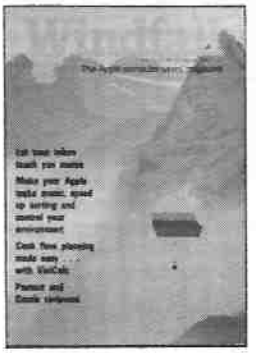
March 1982
Games review (Crush, Crumble and Chomp) – Apple Medical Forum – Data Factory review – Apple Graphics, Part III (displaying histograms) – Printing an annotated DOS disc directory – Crash course in Basic, Part 7 – Start training for the Apple Olympics – Elements of the Apple, Part II – Payroll package for the Apple III – Six educational programs reviewed – DOS 3.3 to 3.2 software switch – Workshop/Wordstar tuition course reviewed. PLUS three pages of Compucopia and four Appletips.

April 1982
Apple speeds the news – Games review (Castle Wolfenstein, Threshold, President Elect) – DOS Toolkit problems – Linking Apples to IBM – Home-grown boards boom – Micro-Finesse review – Basketball match analysis – Elements of the Apple, Part III – FMS accounting system review – DOS disc directory, Part II – Apple graphics, Part IV (3D animation graphics) – Apple '82 Education Forum – A structured approach to teaching. PLUS four pages of Compucopia and five Appletips.

May 1982
A case for Applebus as a international standard – Ga review – Flight Simulator – res Planet Plotting – Mi speed review – Mathem review – Update on Prin (special 16-page printer tion) – The Stationery Rev tion – Understanding M computers (Part IV) – Sim tions Enhance Classroom V – Computers in Business Ed tion Studies – Speedy Wa Handle Histograms. PLUS pages of Compucopia and Appletips.

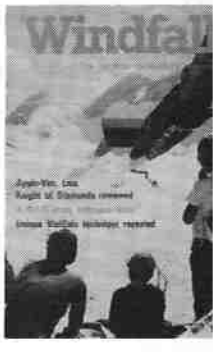
June 1982
New ways of linking Apples to the outside world – Introduction to Forth, Part I – Games review (The Prisoner, Pinball) – Apples in Medicine – Tasc Compiler review – Micros in process control – Building pictures with machine code – High-speed Apple links to mainframes – Wildport cards review – The Last One and CORP program generators reviewed – Book review (Apple II User's Guide) – Teacher's Toolkit and suite of primary school programs reviewed. PLUS four pages of Compucopia and six Appletips.

July 1982
Games review (Pursuit of the Graf Spee) – Elements of the Apple, Part IV – Apple '82 reviewed – Introduction to Forth, Part II – Making the most of VisiCalc's capabilities – CBasic and MBasic analysed – Ormbeta database reviewed – Crossword Magic reviewed – Make your own user port, Part I – Earth Defence game and listing – Asynchronous data transfer, Part I – School application of Cesil – Computers as an aid to concentration – PLUS four pages of Compucopia and three Appletips.



August 1982
Games review (Bandits, Suicide, Swashbuckler, Fly Wars) – Instruction file editor – Teach yourself Morse, Part I – VisiCalc section – Pastext II review – Asynchronous data transfer, Part II – Omnis review – A melody from your micro – Summary of 10 utilities – Make your own user port, Part II – Mah Jong – Number sorting – Elements of the Apple, Part V – Guidelines for buying a school Apple – Educational programs reviewed – PLUS four pages of Compucopia and two Appletips.

September 1982
Use of CP/M COPY and PIP programs – Games review (Odyssey, Choplifter) – DOS aid to VisiCalc – The VisiCalc phenomenon – Wordscore game (listing) – Tasc compiler review – Med-res graphics, Part I – Snapshot review – Learning Morse, Part II – Button for multiple choice testing – Asynchronous data transfer, Part III – Bag of Tricks review – G-WHIZ review – Medic review – Sorting with Pascal – Memory test program (listing). PLUS four pages of Compucopia and six Appletips.



October 1982
Games reviews Knight of D monds (the second wiza scenario) and Pig Pen – Th Tank (with listings) – Med graphics, Part II (filling shapes) – Lisa assemb language review – Magic VisiCalc – VisiCalc Busin Forecasting Model review Cross reference listing progr – Apple-vox speech synthes review – Morse Code, Part I Computerised flash card schools – French Verb progr review. PLUS four pages Compucopia and seven Ap tips.

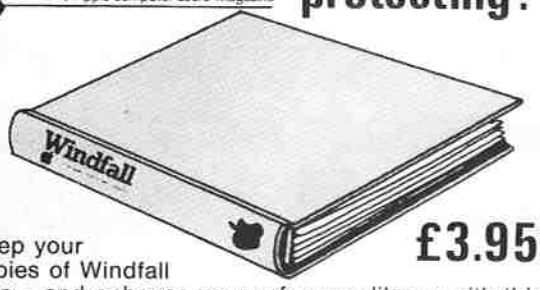
Logo T-Shirts ONLY **£3.29**

Logo Sweat Shirts ONLY **£6.29**

Latest additions to our popular range are Windfall sweat shirts, with mini-Apple motif in six brilliant colours. Now available in two child's sizes, and with red or blue background colour. Our original logo T-shirt and sweat shirts sport the giant-size Apple logo on a white background.

Windfall needs protecting!

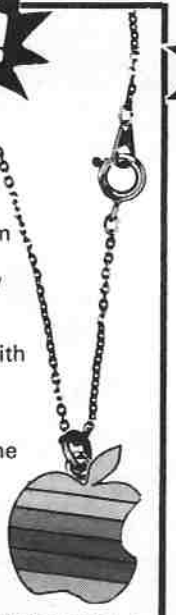
The Apple computer users' magazine



Keep your copies of Windfall safe – and enhance your reference library with this handsome green and gold binder which holds a full 12 issues. Allow 28 days for delivery.

£3.95

NEW!



Following tremendous demand from Apple users we can now offer these attractive necklaces with gilt and enamel pendants displaying the Apple logo.

Special price

£4.99 While stocks last

NEW!

Giant eye-catching poster depicting the distinctive Apple logo in six colours, on a black background.

Size: 749mm x 481mm **£1.50**

ORDER FORM

All prices include postage

SUBSCRIPTIONS — Please enter number required in box — £

UK £12	.....
EIRE £13	.....
EUROPE £18	.....
USA – Surface mail £15	.....
USA – Air mail £25	.....
Rest of world – Surface mail £15	.....
Rest of world – Air mail £30	.....

BACK ISSUES

☐ UK £1.25
Rest of world
☐ – Surface £1.50
☐ – Air mail £2.50

1981		1982	
JULY	☐	JAN	☐
AUG	☐	FEB	☐
SEPT	☐	MAR	☐
OCT	☐	APRIL	☐
NOV	☐	MAY	☐
DEC	☐	JUNE	☐
		JULY	☐
		AUG	☐
		SEPT	☐
		OCT	☐

TOTAL .....

T-SHIRTS **£3.29** (UK & Overseas)

Small – 34"-36"	☐
Medium – 36"-38"	☐
Large – 38"-40"	☐
Extra Large – 40"-42"	☐

TOTAL .....

SWEAT SHIRTS **£6.29** (UK & Overseas)

	Windfall		Logo
	Red	Blue	White
Age 6-8 28"	N/A	N/A	☐
Age 10-12 30"-32"	N/A	N/A	☐
Small 34"-36"	☐	☐	☐
Medium 36"-38"	☐	☐	☐
Large 38"-40"	☐	☐	☐
Extra Large 40"-42"	☐	☐	☐

TOTAL .....

NECKLACES **£4.99** (UK & Overseas) ☐

TOTAL .....

POSTERS **£1.50** (UK & Overseas) ☐

TOTAL .....

TIES **£4.99** (UK & Overseas)

Navy	☐
Brown	☐
Wine	☐

TOTAL .....

BINDERS
UK – £3.95
Overseas – £5.00 ☐

TOTAL .....

Payment: please indicate method (✓) **TOTAL** .....

☐ Access/Mastercharge/Eurocard
☐ Barclaycard/Visa
☐ American Express

Card No. _____

Expiry Date _____

☐ Cheque/PO made payable to Windfall

Name _____

Address _____

_____

Signed _____

Send to: Windfall, FREEPOST, Europa House, 68 Chester Road, Hazel Grove, Stockport SK7 5NY.
(No stamp needed if posted in UK)

Or you can order by phone quoting credit card number and expiry date.

061-456 8383
9.30am - 5.00pm

SUPER FILE CABINET

Data Base Management System
Release 2.0

A DBMS for the Apple Computer that has been designed with simplicity in mind. SUPER FILE CABINET is fast becoming the chosen DBMS in colleges, high schools, libraries, small businesses, and for personal use — both in the U.S. and internationally. It offers all the features of the more expensive data managers, at a fraction of their price.

1. Includes 4 programs: SUPER FILE CABINET, REPORT GENERATOR, DATA BASE ADMINISTRATION and BIG FILE CABINET.
2. Distributed on standard DOS 3.3 diskettes.
3. Complete comprehensive user manual with helpful hints as well as instructions describing how to modify the programs.
4. Files entered with the Apple Contributed FILE CABINET program and the SFC Release 1 programs can be used directly.
5. Requires Applesoft Basic, 48K RAM, and single disk drive. Supports almost any printer.

System features include the following:
— power "boolean" selection criteria and "wildcards".
— completely menu driven for ease of use.
— ability to define data base edits, default values, and date stamps.
— powerful report generator supports sub-totals, mailing labels, user titles, page numbering, and much more.
— mass change and mass delete functions.
— utility functions to copy an entire data base and to add/delete fields without re-entering the data.
— ability to support data bases that are bigger than RAM memory.
— multilevel sorting.

"Elegance and Simplicity"

A real bargain at **$69.95**
Release 1 upgrade fee at **$29.00**
Add $8 for shipping and handling overseas.

ABACUS COMPUTING
75 Hewitt Street
Rochester, NY 14612

PAY LESS FOR THE BEST!

EPSON TYPE 3 PRINTERS.
Save £50-£75 (+ VAT) when you choose your printer from Epson's superb new series, giving you improved performance and many new features.

VISICALC ELECTRONIC WORKSHEET.
The world's best selling software package. We stock the latest version from VISICORP of this and other members of the VISI family. All at very competitive prices.

VERBATIM MINI DISCS.
The world's most popular mini discs at bargain prices.

Write now for FREE LEAFLETS and details of our AMAZING PRICES.

Please state your system and the products you are interested in.

DATATECH LTD (AW),
3 Bramhall Close, Timperley, Altrincham,
Cheshire, WA15 7EB.

APPLE II – TRAVEL AGENTS SYSTEM

Travelplan controls and simplifies administration and accounting, available now with new powerful invoicing, airline returns ticket stock, word processing and nominal ledger programs.
COMPLETE SYSTEMS FROM £3,995 to £6,895 on 3-12 MEG HARD DISC
SOFTWARE ONLY FROM £500 to £1,250

SOFTWARE PROTECTION DEVICE
"CROMWELL" offers max. security for any program inexpensively. First device w/disc £19.80 additional devices £9.00 each – 6 for £50.00.

HARD DISC TURN-KEY PROGRAM
Ideal for multi program users needing "turn-key" may assist in menu on most hard discs – £35.00

For full details write or telephone:

PRINTRONIC LTD
Raglan, Gwent, NP5 2ET. Tel: (0291) 690 214

IF YOU'VE GOT AN APPLE YOU NEED OUR CAT!

48 pages packed full of everything you need for your Apple, all with full details and descriptions, and all at very attractive prices.

Our range covers everything from floppies to Winchesters, from memory boards to keyboards, from business software to games.

And not just hardware and software, but consumables too. Like mailing labels from £1,95/000 (and that's for a quantity of just one box!). And pre printed stationery including typesetting and delivery from £19.95/000 for 5,000 11" x 9.5" sheets!

Every item described in detail, with almost 50,000 words telling you all about the things you need for your Apple.

And it doesn't stop there. The Monitors section includes other fantastic prices like the Prince 12" green screen for just £99.95 including carriage, or in the Daisywheel Printers section there is the Qume Sprint 9/45 at £1,485.00!

And there's a very special offer in the Disk Drives section – how about an Apple compatible 5¼" floppy drive for just £199.50!

But now the bad news. There are many who will want our catalogue just for reference, so it will cost you £1.00 including VAT. The good news is that we will refund your £1.00 on your first order.

So drop us a line (and a pound) right now, or give us a ring with your Access/Barclaycard number, and we'll send our cat by return of post.

Better still why not drop in and see us – we're open 6 days a week 9.00-6.00, and our new retail showroom is full of Apple II and Apple III equipment.

All our prices (except plain stationery) are postage and packing free. Add VAT at the current rate.

We are Apple Level 1 Dealers and TABS Accredited Dealers.

T.V.S

THAMES VALLEY SYSTEMS
GREYS HOUSE,
7 GREYFRIARS ROAD,
READING, BERKS.
RG1 1NU.
Tel: 0734-581829 (2 lines)

WHY ADAM NEWSAGENTS PACKAGE IS THE BEST IN BRITAIN

- It was developed over a two year period in co-operation with an experienced newsagent to serve the real needs of the trade.
- It is extremely fast with complete high speed printouts. Other programs take a few hours to print out lists of rounds. ADAM takes 25-40 minutes for 30 rounds.
- Screen viewing of all details of rounds, papers, customers and delivery schedules.
- Easy alteration of all details including very good editing of customer delivery schedule. ■ Till reconciliation of cumulative weekly takings.
- Full reports of any shortages that have occurred with a substitution allowed if required. ■ Special delivery charge on certain customers and rounds.
- Four magazines allowed to be held while a customer is on a holiday stop!
- Full integrated system, requiring no movement of disks required.
- Complete system variability including no. of customers, no. of rounds, no. of publications etc. ■ Total of all outstanding balances.
- Full error trapping, with special noise protection for the total security of the system. ■ Re-usage of any deleted customers to save space.
- System passwords allow only authorised changing of data.
- On site – point of sale – acceptance of payment with display of customer details, outstanding balance, sundry bills and weekly bills! Statement given on the spot as a receipt, and the date and size of last payment recorded.
- Searches for customer by not only customer number but also by typing in address.
- Built in copying program without any specialized user intervention.
- Please post coupon or telephone for further details.

adam

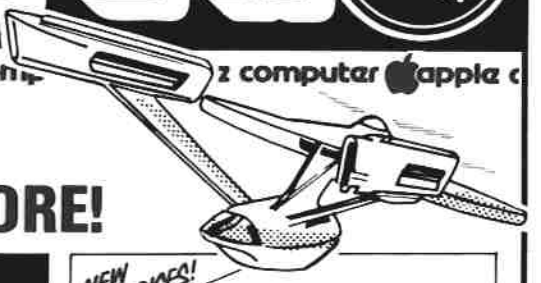
Software Ltd.,
105/107 Whitecross Street, London EC1Y 8JD.
Telephone: 01-628 3531
Telex: 885701.

W1.
Name
Address
Tel:

STARTECH

Absolutly the lowest prices!

omputer apple computer apple computer apple com z computer apple c



BOLDLY GOING WHERE NO PRICES HAVE EVER GONE BEFORE!

NEW LOW PRICES!

£5 OFF!

ALL VISI PRICES

	WAS	NOW
VISICALC. VISICORP	£105.00	£100.00
VISIDEX. VISICORP	£127.95	£122.95
VISIFACTORY. MICRO	£37.95	£32.95
VISIFILE. VISICORP	£120.95	£115.95
VISIPLOT. VISICORP	£98.95	£93.95
VISISCHEDULE. VISICORP	£149.95	£144.95
VISITERM. VISICORP	£53.95	£48.95
VISITREND/VISIPLOT. VISICORP	£148.95	£143.95
DESK TOP PLAN 11: PERSONAL SOFTWARE	£131.95	£126.95

NEW LOW PRICES!

£5 OFF!

16K RAM CARDS

(Pascal CPM: Computer Stop)

WAS ~~£49.95~~ NOW £44.95

NEW LOW PRICES!

SENSATIONAL REDUCTION!

D BASE II

(Relational D Base; Ashton Tate)

WAS ~~£318.95~~ NOW £299

NEW LOW PRICES!

MAILMERGE PRICES SLAMMED!

Mailmerge; Micropro

WAS ~~£47.95~~ NOW £39.95

NEW LOW PRICES!

£5 OFF!

APPLESOFT COMPILERS!

Hayden Applesoft Compiler

WAS ~~£87.95~~ NOW £82.95

Tax Applesoft Compiler; Microsoft

WAS ~~£80.95~~ NOW £75.95

ADVENTURE

Adventure (Microsoft): Microsoft	£13.95
Ali Baba + 40 Thieves: Quality Software	£17.95
Castle Wolfenstein: Muse	£13.95
Dark Forest: Sirius Software	£15.95
Datestones of Ryn: Automated Simulations	£10.95
Soft Porn Adventure: On Line	£13.95
Space Adventure: Siera Software	£14.95
Time Zone: On Line	£40.95
Wizzard + Princess: On Line	£14.95
Zork 2: Infocom	£19.95

BOOK

Beaneath Apple Dos: Quality Software	£9.95

BUSINESS

Address Book (List) Muse	£23.95
Data Factory: Micro Lab	£72.95
Data Factory 5.0: Micro Lab	£139.95
DB Master: Stoneware	£104.95
Magic Window (WP): Artsci	£46.95
Personal Filing Sys. (PFS): Software Publishing Corp	£40.95
Personal Report Sys. (PRS): Software Publishing Corp	£40.95

GRAPHICS UTILITY

A2302 Enhancement: Sub Logic	£13.95
A2601 Graphics: Sub Logic	£32.95
Hi-Res Secrets: Avant Garde	£60.95

HI-RES ACTION

Alien Rain: Broderbund	£13.95
Anti Balistic Missile: Muse	£12.95
Apple Panic: Broderbund	£14.95
Flight Simulator: Sub Logic	£18.95
Frogger: On Line	£17.95
Gorgon: Sirius Software	£17.95
Snoggle: Broderbund	£17.95
Space Eggs: Sirius Software	£12.95
Space Quarks: Broderbund	£13.95
Swashbuckler: Datamost	£12.95
Hi-Res Soccer: On Line	£13.95

LANGUAGE

Asm Lang: Development Sys: Hayden	£24.95
Expediter 11 Compiler: On Line	£39.95
Fourth 11 (Language): Softape	£31.95
Lisa 2-5 6502 Assembler: On Line	£45.95

STRATEGY GAME

Air Traffic Controller: Avant Garde	£7.95
Robot Wars: Muse	£18.95
Tigers In The Snow: Strategic Simulations	£17.95

UTILITY

Black It Up: Sensible Software	£30.95
Bag of Tricks: Quality Software	£20.95
Deadly Secrets: Broderbund	£17.95
Dossource 3.3 Dos Listing: Lazer	£18.95
Program Line Editor: Synergistic Software	£18.95

HARDWARE

Excel-9 (6809 With "Flex"): ESD Laboratory Co. Ltd	£164.95
23 Key Keypad (Visicalc): Keyboard Company	£101.95
Omnivision 80/24 Video: Computer Stop	£144.95
U Term 80/24 Video Card: U Micros	£151.95
Z80 Softcard: Microsoft	£203.95
10 Meg Hard Disk System: Computer Stop	£1644.95

Z80 CPM (Z80 Softcard Required)

Wordstar: Micropro	£137.95
D Base 11 Manual: Ashton Tate	£33.95
Alds Z80, 8080 Assembler: Microsoft	£57.95
Bstam Micro To Micro: Byrom	£108.95

Please send me:

.....

.....

.....

I enclose cheque/P.O. for

.....

Name:

.....

Address:

.....

.....

.....

.....

Please add V.A.T. to all orders.
Postage paid in U.K. Allow 30 days for delivery. Access & Barclaycard orders welcome on **051-256 8244** WF. 11.82

STARTECH

63 Lisburn Lane,
Tuebrook, Liverpool L13 9AF

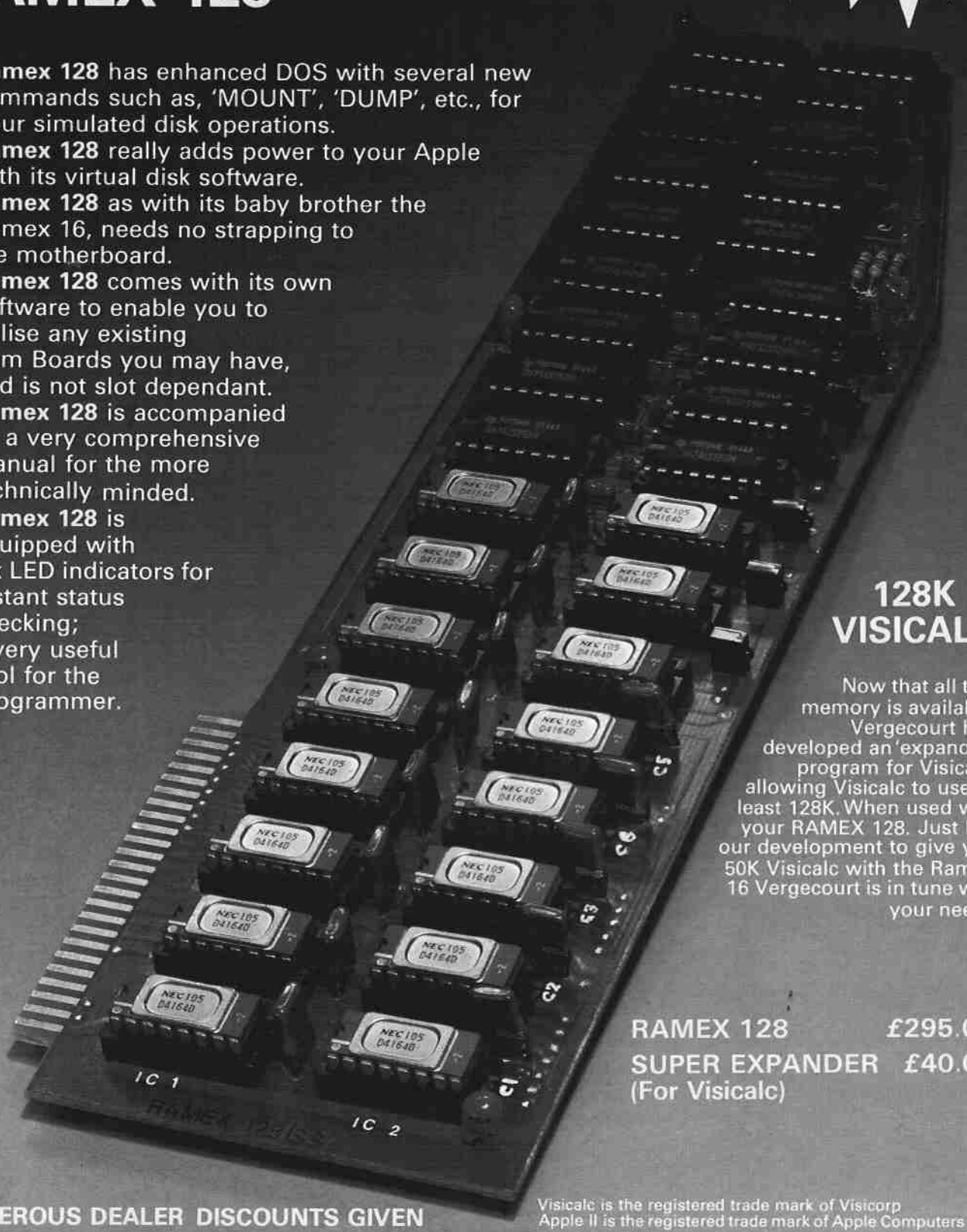
Advertisers in this issue

The ultimate in expansion for your Apple II from the people that gave you the RAMEX 16. The first Ram Expansion Card to go strapless.

NEW

RAMEX 128©

- ★ **Ramex 128** has enhanced DOS with several new commands such as, 'MOUNT', 'DUMP', etc., for your simulated disk operations.
- ★ **Ramex 128** really adds power to your Apple with its virtual disk software.
- ★ **Ramex 128** as with its baby brother the Ramex 16, needs no strapping to the motherboard.
- ★ **Ramex 128** comes with its own software to enable you to utilise any existing Ram Boards you may have, and is not slot dependant.
- ★ **Ramex 128** is accompanied by a very comprehensive manual for the more technically minded.
- ★ **Ramex 128** is equipped with six LED indicators for instant status checking; a very useful tool for the programmer.



128K VISICALC

Now that all this memory is available, Vergecourt has developed an 'expander' program for Visicalc, allowing Visicalc to use at least 128K. When used with your RAMEX 128. Just like our development to give you 50K Visicalc with the Ramex 16 Vergecourt is in tune with your needs.

RAMEX 128	£295.00
SUPER EXPANDER (For Visicalc)	£40.00

GENEROUS DEALER DISCOUNTS GIVEN

Visicalc is the registered trade mark of Visicorp
Apple II is the registered trade mark of Apple Computers Inc.

VERGECOURT LTD

DDP RESEARCH & MARKETING

Reg Office: 17 Nobel Square, Basildon, Essex SS13 1LP
Telephone: 0268 728484
Telex: 995323

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