

COMPUTER MAGAZINE OF THE YEAR*

\$3.95
NZ\$4.95 ^{inc} GST
JANUARY 1987

**WIN AN
APPLE IIGS
SEE INSIDE**

your computer year book

BORLAND BOUNTY

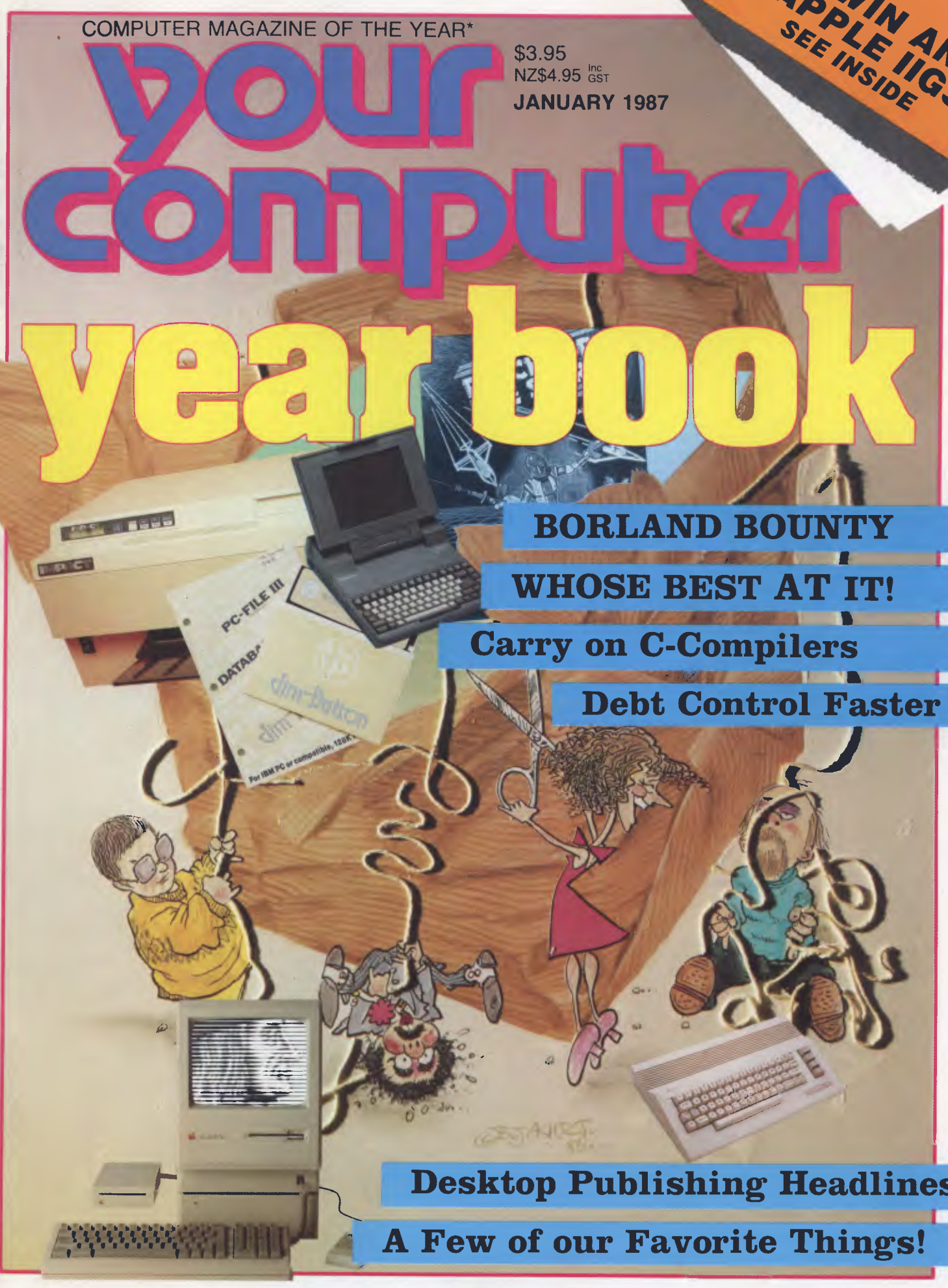
WHOSE BEST AT IT!

Carry on C-Compilers

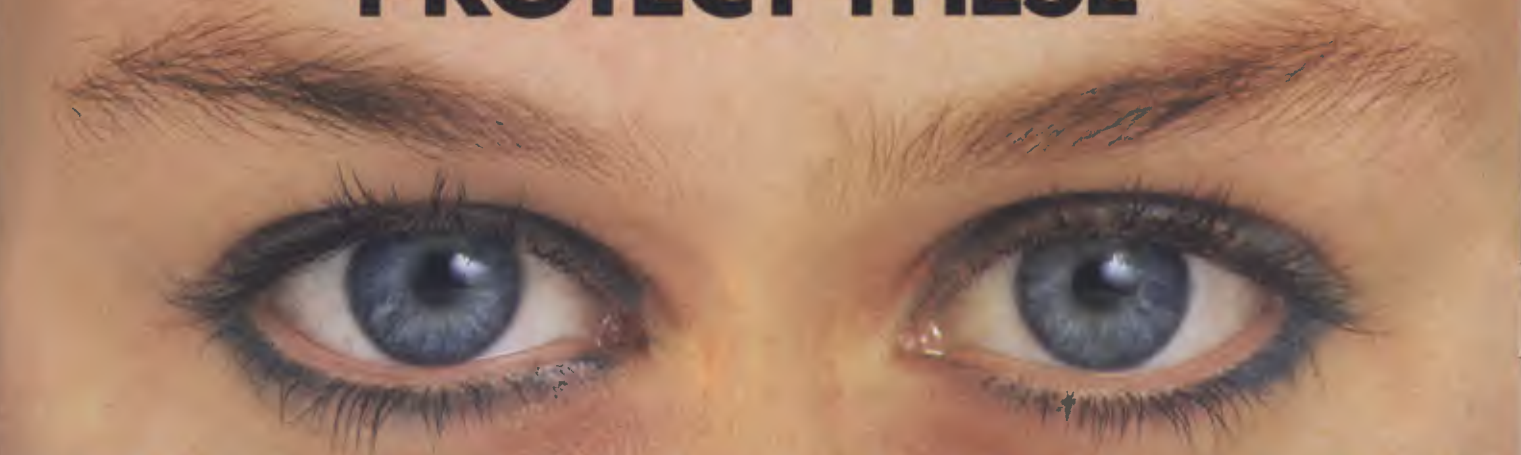
Debt Control Faster

Desktop Publishing Headlines

A Few of our Favorite Things!



PROTECT THESE



FROM PERMANENT DAMAGE

IF YOU OR YOUR STAFF USE A COLOUR COMPUTER MONITOR YOU MUST READ THIS.

Why risk damaging your eyes permanently by using inferior computer monitors?

TVM offer you the **WORLD'S ONLY, ZERO DEFECT MONITOR**, with a 20% larger screen, High Resolution clarity at a price **YOU CAN AFFORD.**



FULL 12 month REPLACEMENT

ASK FOR TVM BY NAME.

SMART BUSINESSES ARE DISCOVERING THESE ADVANTAGES AND BENEFITS OF USING A TVM MONITOR.



14", 20% LARGER, SUPER DARK, NON-GLARE SCREEN.

Cuts eye strain, improves clarity, **NO** daylight squinting.

X-RAY LEAKPROOF DESIGN.

NO radiation damage to eyes.

HIGH RESOLUTION COLOUR or MONO MONITOR.

4096 deeper, brighter colours.

7-COLOUR MONO DISPLAY FEATURE, PLUS WHITE REVERSE.

Choose the most comfortable colour.

KELLER AUTOMATION



NEWLY APPOINTED EXCLUSIVE
AUST DISTRIBUTOR

**PRICED FROM
\$395**

(ex-stock)

MELBOURNE – SYDNEY – NEWCASTLE – BRISBANE
HOBART – ADELAIDE – PERTH – AUCKLAND

14 Whiteside Road, Clayton South, Vic 3169
Tel: (03) 543 7244. Tlx: AA31781 Fax: (03) 543 5230.

CONTENTS



NEWS 8

FEATURES 18

A Few of our Favorite Things	18
At Last! AT Best	34
Borland Roundup	44
The Orchard Under Seige	50
Choosing a Few of our Favorite Cs	68
Debtmaster Part 3	77

REVIEWS 81

Under the Spotlight	81
Keeping the 8-Bit CP/M House in Order	97
APC IV ME	102
The Little Blue Sports Car	108
Hard Disk Hokum	110
Say It With Votalker	113
GEOS! It's a New Commodore 64	117

POCKET PROGRAMS 90

TUTORIALS 85

The Encyclopaedia of Batch File Programming Pt 2	85
Byting ProDOS Back Part 3	132
C for Smarties Part 13	134

PUBLIC DOMAIN 136

New Products	136
Your Bee	142
Your Mac	144
IBM Underground	145
Your C64	149
The Prophet Speaks	150
Lotus Hotline	156
Your Apple	159
Services	160
Reader's Classifieds	161

AN APPLE A DECADE 124

Win an APPLE IIGS	128
-------------------	-----

HI-TECH C COMPILER

The HI-TECH C COMPILER is an all Australian high performance C compiler for the Z80 and 8086/8088 processors. Now in use at thousands of sites in Australia and overseas, it combines an excellent user interface and diagnostic messages with smaller, faster generated code than any other compiler. It runs on CP/M-80, PC-DOS, MS-DOS, CP/M-86 and Concurrent CP/M. It allows for the generation of ROM based code and comes with a macro assembler, linker and librarian. The 8086 compiler supports large and small memory models and the 8087 maths co-processor. A cross compiler running under MS-DOS and producing code for the Z80 is also available.

Prices:	8086 Compiler for MS-DOS or CP/M-86	\$300.00
	Z80 Compiler for CP/M-80	\$250.00
	Z80 Cross compiler for MS-DOS	\$300.00

SNAKE

SNAKE is a utility for MS-DOS functionally equivalent to the Unix MAKE command. It automates the recompilation of any modified modules of a programme. This is an indispensable tool for any serious programmer using C or any other compiled language.

Prices:	SNAKE	\$89.00
	SNAKE + BTree + ISAM	\$249.00

BTREE & ISAM

BTree is a b-tree based index and data file manager supplied in C source code form. ISAM is a higher level set of routines providing powerful database management, also in C source form. ISAM requires BTree.

Prices:	BTree	\$119.00
	BTree + ISAM	\$179.00

MACRO ASSEMBLERS

HI-TECH Software has macro assemblers to run under MS-DOS or CP/M for the following micros: 8080, 8085, 8086, 80186, Z80, NSC800, 6800, 6801, 6805, 6809, 6301, 6303 and 64180. All use standard manufacturers mnemonics and come with a powerful linker librarian and object code convertor. The assemblers absolute or relocatable code and Intel and Motorola Hex formats are supported.

Price: \$250.00

A BOOK ON C

"A Book on C" by Al Kelley and Ira Pohl is an indispensable guide for every C programmer, whether a beginner or an experienced professional. An excellent introduction and a comprehensive reference to the C language, it has many examples and working programmes.

Price: \$34.95

**HI-TECH
SOFTWARE**
The leading edge of Software Technology

P.O. Box 103, ALDERLEY, QLD 4051, Australia.

Phone: (07) 38 6971 International: +61 7 38 6971

Telex: AA144245 Bulletin Board: (07) 38 6872



MONEY BACK GUARANTEE

All software sold by us has an unconditional 14 day money back guarantee; if you are not satisfied with your purchase you may return it for a full refund.

Of course if you do have any problems or questions we are only too happy to resolve them and will do our utmost to ensure that you have effective, working software.

IMPORTANT NOTE

All software is supplied under licence only.

The terms and conditions are spelt out in our standard licence form, which is included in all documentation, or available on request.

DELIVERY

All orders: \$8.00

* All prices are plus sales tax, currently 20%
Phone your Mastercard, Visa or Bankcard order today or write to:
P.O. Box 103, Alderley, Qld 4051

ANNOUNCING:
New Products Available Soon
68000 Cross compiler
running under MS-DOS

AVAILABLE NOW!
C source code for all assemblers
and compilers suitable for any
Unix system. Contact us for prices.
lp - A C library of printer routines:
\$139.00 + tax



A Computer Consultant's Catch-up Cry

PEOPLE OFTEN ASK me: 'How do you keep up with developments in this industry?' These days, dare I say it, the answer would have to be that I don't. No body can; even the most diligent dilettante would be hard pressed to read all the product announcements, market research reports and news reports this industry generates, let alone listen to all the rumours and scuttlebut. Anyone who actually has to apply this information in some way, in management decisions or by writing magazine articles, is doomed to fall behind.

My feeling is that in my job it is better to put some effort into applying this information, and to better appreciate the problems and difficulties of the PC user, than to be an uncritical observer and reporter of the masses of (often erroneous) information. Many journalists don't realise how owners of an original-model PC with a standard colour graphics adapter find gushy reviews of the latest model AT clone with multi-standard graphics card not just uninteresting, not just useless, but actually irritating.

However, I still feel some fascination with the developments of our industry, and I still devote considerable time to keeping myself abreast of developments and trying to relate them to practical concerns like getting my work done. One of the best ways to do this, I've discovered, is through the Australian Computer Society's annual PC Conference.

This year, as in previous years, I'm on the organising committee, which gives me an oppor-

tunity to influence the choice of speakers and listen to people who are really close to developments in the United States. Last year, for example, we had speakers of the calibre of John Sculley, President and Chief Executive Officer of Apple; Bill Gates, Chairman of Microsoft; Chuck Digate, General Manager of International Sales at Lotus Development Corporation; Cyril Yansouni, Vice President of Hewlett-Packard and General Manager of their PC Group; and Ben Rosen, Chairman of Compaq Computer Corporation. These people are right at the heart of the industry.

This year, it's on again, on March 18th to 20th, and promises to be bigger and better than ever before. We've started signing up speakers from overseas and locally, and can promise that this conference will provide a stimulating mix of practical, directly applicable information, and a conceptual overview of the industry's dynamics.

I can't say too much yet about speakers, until we've got some more definite acceptances (but remember, America is full of people who want to visit Australia and see kangaroos and crocodiles!), but I can tell you we have a really interesting selection of topics: communications, networking, CAD/CAM and graphics on PCs, UNIX on PCs, the impact and practical application of the 80386 processor, future DOS directions, what IBM is up to, what IBM thinks it's up to, and even more.

Put the dates in your calendar now, and watch for forthcoming publicity.

LES BELL

Editor

Natalie Filatoff
Consulting Editor
 Les Bell
Mastermind
 Matt Whelan
Production Editor
 Jake Kennedy
Managing Editor
 Leo Simpson
Designer
 Kenneth Whipp
Production
 Mark Moes
Publisher
 Michael Hannan

Contributors

Australia: Brendan Akhurst, Ian Allen, Bill Bolton, Darren Challis, Stewart Fist, Phil Grouse, Tim Hartnell, John Hepworth, Dan Lawrence, Frank Lee, Bruce Mitchell, John Nicholls, Jeff Richards, Ewart Stronach, Dom Swinkels, Colin Tringham.
 United States: Howard Karten

Office Services

Carmel Trulicic
Subscription Enquiries
 Julie Plummer
Advertising Sales
 National Advertising Manager:
 Damien Prins
 NSW Sales: Craig Rowe
 Victorian Sales: Grant Collins
Advertising Production
 Danny Hooper

OFFICES

Editorial and NSW Advertising:

180 Bourke Rd, Alexandria 2015.
 Tel: (02) 693 6666
 Tlx: FEDPUB AA74488
 Fax: (02) 693 2842

Victoria

150 Lonsdale St, Melbourne 3000.
 Tel: (03) 662 1222
 Tlx: FEDPUB AA34340

Western Australia

Estelle de San Miguel, John Fairfax and Sons,
 454 Murray Street, Perth 6000.
 Tel: (09) 481 3171
 Tlx: FAXWEST AA92635

Queensland

Damien Prins
 180 Bourke Rd, Alexandria 2015.
 Tel: (02) 693 6666
 Tlx: FEDPUB AA74488

South Australia

Dane Hansen, John Fairfax and Sons
 101 Waymouth St, Adelaide 5000.
 Tel: (08) 212 1212
 Tlx: AA82930

YOUR COMPUTER

is published monthly by
The Federal Publishing Co Pty Ltd,
 Printed by Hannanprint,
 140 Bourke Rd, Alexandria 2015.
 Distributed Nationally by
 The Federal Publishing Co Pty Ltd.

Registered for posting as
 Publication No. NBP4384.
 See 'Public Domain' section for
 information on copyright,
 contributions, reader services
 and subscriptions.

*Recommended and maximum price
ISSN 0725-3931.

FREE SOFTWARE

SPECIAL SELECTIONS FROM THE PUBLIC DOMAIN (02) 29 2866

Well, almost free. We don't charge for the public domain software but there is a small service charge of \$15 per disk to cover promotion costs, selection, testing, copying, etc. Disks are available for CP/M, MS-DOS and APPLE. Mail and telephone order only.

The programmes have been carefully selected, tested and documented. They'll run on a wide variety of computers that accept 5 1/4" disks. We have tried to choose programmes as machine-independent as possible. However we cannot guarantee the suitability of programmes for your particular machine. Wherever possible we include source-code.

MS-DOS programmes are aimed at the IBM-PC and close compatibles. The NEC APC III will often require the software library extension card to be able to execute these programmes.

Documentation is included on the disks where required — often it is very extensive. Unfortunately, we are unable to provide telephone tutorials on using the programmes.

MS-DOS disks are formatted for standard MS-DOS 2.11 360K. Testing has been carried out for CP/M disks on a Z80 Kaypro II.

About 120 different formats are supported, including Kaypro, Osborne, Tandy, Microbee, Bondwell, Commodore 128, Televideo and Apple II.

MS/DOS

DISK No.

GAMES

M5: SUPER COMPILED GAMES. Eight arcade games for those with colour graphics adaptor. Very absorbing. Includes Pango, Gold, Pyramid, 3-Demon, etc.

M8: SELECTED FAMILY FUN GAMES. A flight simulator, music generator, excellent Pacgirl, space wars, etc.

M11: MONOPOLY. An excellent computer version of this popular board game.

M12: GAMBLING GAMES. One-Armed Bandit, Poker, Blackjack, Roulette.

M13: DUNGEONS & DRAGONS. Cave Quest — a very good adventure game. If you like monsters and magic this is for you.

M14: CREATE YOUR OWN ADVENTURES. An adventure shell that enables you to design your own game.

M15+: TRIVIA COLLECTION. A two-disk set in the trivia quiz tradition. Will amuse you for hours. \$30.

M16: MOVIEDATABASE. Contains details of nearly 2000 movies which are available on videotape. Search by title, rating, cast members, writer, director, etc.

M17: PINBALL GAMES. Contains three fascinating games of varying degrees of difficulty. Engrossing.

M18: SOLUTIONS TO ADVENTURE GAMES. Special collection of hints to solve games such as ZORK I, II, III, Hitchhikers, Starcross, Deadline, Witness, Mask of the Sun, Serpents Star, Dark Crystal, Planetfall, The Enchanters, Death in the Caribbean, Infidel, and Seastalker.

M19: NAME THAT TUNE. Designed in the trivia tradition, your computer plays well-known but frustratingly elusive melodies.

UTILITIES

M21: UTILITIES. These are essential and include file maintenance superstars like **SWEEP** and **WASH** as well as library and squeeze/unsqueeze programmes. Lots of them.

M23: UTILITIES. Make life easier for yourself with programmes like Util, Z, Vtype, ST, Protect, Unprotect.

M25: SELECTED UTILITIES. Dozens of highly useful utilities, with documentation, compiled and ready to go. Includes Autodex (super file manager), Membrain (ramdisk) Squeeze and Unsqueeze, Directory Printer, Calendar, File Finder (great for hard-disk), Keyboard Definer, etc.

M26: UTILITIES FOR PERSONAL MANAGEMENT. Similar to side-kick, these are background utilities that provide calculator, notepad/editor, phone index, alarm clock, calendar, printer controls, typewriter-simulator, window access to directory, display/remove/copy/rename files, etc.

M27: UNPROTECTION METHODS. Hints and programmes that help you to back-up a variety of copy-protected programmes. New 3 disk set for \$30 instead of \$45.

M29: DISK LIBRARIAN. A collection of some of the best programmes available for cataloguing your disks and keeping track of files. Provides an alphabetical master list, etc.

M32: DISK DOCTOR COLLECTION. Some of the best debugging and file repair programmes around. Includes Jaz, Easy-Zap, Diskit, etc. OK for hard disks too.

M33: HARD DISK UTILITIES. A special collection of utilities from more than two dozen other disks. For cataloguing, sorting, backing up, changing file attributes, etc.

M34: MULTI-TASKING SHELL. On this disk we have two excellent DOS Shells which allow you to operate and execute from a menu system — Dosomatic and Still River Shell. Interrupt tasks and switch to other programmes, Enjoy a superior work environment.

M35: CP/M EMULATION. Run CP/M software on your PC! Well documented and source coding is provided.

M36: SUPER DISK CATALOGUER. This is a superior capacity disk catalogue that will put order into your files, print listings, locate files, give directory printouts, etc. Ver. 1.3.

WORD PROCESSING

M43: MULTI-FONT WRITER. An incredible word-processing package that prints out scientific notation, Greek letters, gothic, italics, etc. Recommended.

M48: OUTLINER FOR WORD PROCESSING. Considered by many to be the best outliner/ideas processor available. Is fast, can be memory resident, has windows, excellent printing features, etc.

M49: FORM LETTERS. Examples of the most commonly-used business letters — overdue accounts, apologies, credit, layoff, account acceptance, thank you, invitation response, and many more.

M50: PRINTER AND TEXT UTILITIES. Includes memory-resident Note Pad and Cut & Paste, Index System for text files including Wordstar, and Epson Printer Control that sets printer and provides foreign characters.

M51: STYLE ANALYSER. Examines text that you've written and suggests ways that you can improve written expression.

M52+: POWERFUL WORD PROCESSOR. With many features such as split screen, windows, macros, footnotes, indexing, mail-merge, programming language and laserjet drive. Two disk set \$36. NYWord vers 1.2

GRAPHICS

M61: GRAPHICS. A selection of some of the best programmes in the public domain, including an extensive picture-graphics set of commercial standard.

M65: SPRITE GRAPHICS. Lets you create sprite characters from a set of coloured pixels for your programmes. It is self-documenting and contains a sample file. Allows you to display the figure in one step.

M66: EXTENDED FONT CHARACTERS. PC-FONT ver 2.04 is a utility for Epson-compatible printers that will print all of the printable characters of MS-DOS character set — including block graphics, engineering and scientific, foreign language, etc. Control the size, style, density, linespacing, etc. Have solid underline and vertical lines. Gives a more professional output.

M67: COMPUTER-AIDED DESIGN. Powerful control over drawing, graphics, printing and slide show. For easy creation and editing of graphics screens. Two disk set \$30.

M68: GRAPHIC CHARACTER GENERATOR. Create a variety of graphic icons. Also lets you cross-stitch graphics. Contains Icon Master.

LANGUAGES

M85: LANGUAGE — PASCAL. One of the most popular languages for general programming. Well-documented. A very good choice for learning to programme.

M87: SCREEN DESIGNER. An easy to use interactive screen designer to assist you with your programmes. Suits Basic programming.

M91+: TURBO PASCAL LIBRARY — SET 1. Special set of routines, aids and utilities for programming in Turbo Pascal. 7 Disks for \$70 instead of \$105.

M92+: TURBO PASCAL LIBRARY — SET 2. Special set of routines, aids and utilities from Turbo User Group for programming in Turbo Pascal. 6 Disks for \$60 instead of \$90.

M93+: C LANGUAGE LIBRARY. Special set of routines, aids and utilities for programming in C. 6 disks for \$60 instead of \$90.

M94+: ARTIFICIAL INTELLIGENCE. These disks contain TWO Expert System Shells — ESIE and EXPERT. They help you design a system that will gather information and make a recommendation. \$30.

M95+: LANGUAGE — BASIC. This is Snocrest Basic, a two-disk set that contains a real Basic interpreter with manual. Also suits a multi-user system. \$30.

FREE SOFTWARE

SPECIAL SELECTIONS FROM THE PUBLIC DOMAIN (02) 29 2866

M96: LANGUAGE — LOGO. Ladybug provides a popular, turtle-graphics oriented version of this language. Suitable for teaching computer concepts to kids.

COMMUNICATION

M101: COMMUNICATIONS, MODEMS. Two major communication programmes — qmodem and kermit. Lots of bells and whistles.

M103/4: BULLETIN BOARD. A New version (14.1A) of RBBS, a very popular system for those wanting to operate a bulletin board. Well-documented. In compiled Basic with source code. Two disk set \$30.

M107: BULLETIN BOARD LISTING. A comprehensive list of Australian Bulletin Boards. Text files are available in a variety of disk formats.

M108: COMMUNICATION — QMODEM ver 2.0E. A popular programme for modems. Has installation programme. For communicating with bulletin boards. An update.

M109: COMMUNICATION — KERMIT ver 2.28. An updated version of this well-known programme for communication with bulletin boards and other computers. Has source code.

M110: FIDO COMMUNICATIONS NETWORK. This is a famous Bulletin Board System that links up with other bulletin boards.

BUSINESS/ACCOUNTING

M121: GENERAL LEDGER ACCOUNTING. A small-business recording system. Highly regarded. Excellent reports.

M124: STOCK MARKET ANALYSIS. Special aids to help you "think and grow rich". For managing and evaluating portfolios and prospects.

M125: PROJECT/TIME MANAGEMENT. Improving organisation and goal accomplishment. Arranges information, prompts for action.

M126: STATISTICAL ANALYSIS: EPISTAT V3. More than two dozen related basic programmes for analysis-including Chi square, linear regression, Fisher, Binomial, Analysis of Variance, Histogram, Poisson, Correlation, etc.

M128+: INTEGRATED SPREADSHEET. A two disk set of a comprehensive spreadsheet programme. Has Basic and compiled versions with documentation. \$30 for 2 disks. Includes integrated word processor/spreadsheet/database/graphics.

M129: 1-2-3 UTILITIES. Highly regarded collection of utilities that enhance the operations of Lotus 1-2-3.

M132+: 1-2-3 WORKSHEETS. Comprehensive special set of worksheet, aids and utilities for lotus 1-2-3. \$80 for 8 disks instead of \$120. (Does not include M129).

M133: BUSINESS EMULATION. Examine alternatives for better results in manufacture, marketing, advertising, sales, finance, purchasing, labour relations, personnel, banking, and financial planning.

M134+: DEBTORS BILLING. A comprehensive system for maintaining debtors' records, issuing notices and analyses, etc. Two disk set \$30.

M135+: FARM MANAGEMENT. A useful collection of decision/analysis tools. Includes computations for gestation and feeding, harvest and storage strategies, firm price analyses, break-even prices and yields, livestock diets, budgetting, loan calculation, and more. 3 disk set \$45.

M136: PROJECT MANAGEMENT. For construction. Will handle 1000 tasks and does critical path analysis, cash flow, bar charts, cost reports, etc, with subcontractors. Menu driven.

M137: STOCK CHARTING. Keeps track of Stock Market movements — highs, lows, volume, moving average, etc. Requires Basic.

M138+: SALESMAN'S FRIEND. Helps you to keep track of prospects, leads and memos. Also has a built-in word processor and sample formats of letters. Two disk set with tutorial: \$36.

M139: PROJECT QUOTATION. Prepare quotations for projects combining materials, parts, labour, profit margins, etc.

DATABASE MANAGEMENT

M142+: DBASE 11/111 APPLICATIONS. Extensive group of Dbase applications, programme extensions and algorithms. Includes cheque programmes, mail management, inventory control, budgeting and accounting, memo maker, phone index, menu drive, typewriter simulation, depreciation, automatic formatting, search for duplicate entries, Spanish lessons, runtime decoder, graphics and other utilities. Set of 5 for \$50 instead of \$75.

M143: FAMILY TREE/GENEALOGY. Extensive programmes in basic for recording, tracing, grouping, printing, etc., family relationships.

M147: DBASE 111 SCREEN/CODE GENERATOR. Greatly reduces the amount of programming you need to do. Much of the coding is generated to include in your own programme.

M149: FORMS AND REPORTS. A forms generator for displaying information contained in data bases. Compatible with PC-File also.

M150+: SUPER NEW DATA BASE MANAGER. File Express suits sales/stocks/mailling/personnel/payroll. Will calculate, print invoices, labels, etc. Compatible with PC-File. Two disk set \$30. Very good documentation.

M151: MAILING LIST MANAGER. Well-documented programmes that allow you to add, edit, sort, and print mailing labels for all members or selected groups.

M152+: RBASE LOOKALIKE. A three disk set of a powerful, sophisticated database management programme (PC-RIM — Relational Information System ver 5). Operates as standalone system in both menu and command modes or will drive application programmes. Has natural language query system. Extensive documentation and help files. \$45.

EDUCATION

M201: EDUCATION. BASIC TUTORIAL. How to programme in Basic. Onscreen demonstration and explanation.

M203: MATHS TUTOR. A Basic programme that suits primary classes. Has six grades of arithmetic training.

M204: PC-TUTORIAL. Learn more about the operation of your computer, the important commands, etc.

M205+: SPELLING AND VOCABULARY. Suits high school+. Contains 7500 words, but not the most common 4000 — the next most commonly used words. Compiled, with Basic source code included. 4 disk set for \$45 instead of \$60.

M206: HISTORY EDUCATION. A Basic educational game that teaches history. An adventure approach that wins/loses gold, has time warps etc. American conditions but questions can be changed.

SHAREWARE REQUIRED FOR INTERNATIONAL DISTRIBUTION

Select Software has offices and extensive marketing facilities in Australia, New Zealand, the U.K. and very soon in the U.S.A. We are looking for quality Australian and New Zealand software for distribution locally and overseas.

We promote directly to the end user so your product is brought to the attention of hundreds of thousands of potential users, as well as being described in our catalogue.

You retain copyright and we collect on your behalf contributions made by satisfied users. If you wish we can also release your enhanced versions and updates to those becoming registered users.

Naturally we require your permission to copy and distribute your programmes and to charge our normal service fee. Submissions should be original and designed to run on the IBM PC and compatibles. Adequate documentation is required on the disk.

A number of software authors who have been successful with shareware are earning hundreds of thousands of dollars each year — whilst striking a blow for low cost software!

This is your chance to break into the International market at no cost to you. Submissions should be sent to our Chief Executive at the address below.

APPLE II, CPM, MACINTOSH COMMODORE 64

Call or write for free catalogue.

PUBLIC DOMAIN NEWSLETTER

For news, reviews, views and how to use public domain software subscribe to our bi-monthly newsletter and keep informed on the free programmes that help your computer to serve you. Only \$15 per annum. Includes updates to catalogue.

ORDERS

Each disk costs \$15 (Macintosh \$20). Add 20% Sales Tax to cost for disks plus \$3 postage and packaging to your total order. Orders must be prepaid.

*The Public Domain Newsletter costs \$15 per annum and is issued bi-monthly.

PAYMENT BY MAIL TO:
Box C343 Clarence St, PO, Sydney NSW 2000.

TELEPHONE ORDERS:
Pay by Bankcard, Mastercard or Visa.
(02) 29 2866, (02) 29 3810.

OFFICE:
3 Barrack St., Sydney, NSW.

PLEASE INDICATE THE DISK FORMAT REQUIRED WITH AN ALTERNATIVE FORMAT IF POSSIBLE.

SELECT SOFTWARE

Mail And Telephone Order Only.

We cannot guarantee the suitability of public domain/user-supported software for users' needs or equipment.

SOMEONE'S DONE THEIR RESEARCH

XEROX CORP SHOWED IT HAS lost none of its old touch for leading-edge research, by opening a series of centres throughout the world dedicated to work in the field of artificial intelligence.

In Australia, Xerox donated more than \$1 million to Victoria's Deakin University, to help fund an artificial intelligence laboratory.

The Centre will offer consulting services to commerce and industry, in refining and developing software environments and applications suitable for the export market.

It will also work on the development of expert 'shells' and knowledge bases, drawing on the knowledge of local experts and transforming it into systems that can be used by novices.

Professor Brian Garner, founding professor of computing at Deakin University, said: "The laboratory could, for example, create a knowledge base used by someone like a specialist mechanic and use it to develop a useful tool for all garages."

In the United States, Xerox announced a program that will use AI to teach workers who lack basic skills. To this end Xerox has injected \$US5 million to fund a new non-profit research centre — the Institute for Research on Learning — which is intended to provide the American business community with a labour pool of workers.

American businesses are reported to be hiring more than one million new workers each year who cannot read, write or count, and United States Commerce Secretary Malcolm Baldrige said the country could not compete in the global economy without trained people.

"I like the idea of giving people who have failed before, another chance," added Baldrige.

The Institute will be linked with Xerox's Palo Alto Research Center and with the University of California's Graduate School of Education. The resulting AI systems will be designed for use in traditional classroom learning, and training in the workplace.

In the England, Xerox said it would open a facility in Cambridge, aimed at boosting United States co-operation with Western Europe on new ideas in high technology.

"The initial cost of this facility will be approximately one million pounds per year," said Rank Xerox Chief Executive Officer Roland Magnin.

Researchers at Cambridge will be given equipment from the Xerox Palo Alto Research Center (PARC) in California. To be known as Uro-PARC, the center is scheduled to be opened early next year, with European, American, Japanese and researchers of other nationalities working together. Projects are likely to include voice-recognition systems and the development of screens sensitive to gestures of the human hand.

"That's the sort of stuff of the 21st Century, but we are beginning slowly to break that barrier," said Xerox researcher Thomas P. Moran, who teaches at Stanford.

According to Roland Magnin, "The new center will enable us to make the best possible use of American research, and at the same time feed off the fruits of European research."

LAPTOPS UP TO OUR CHINS

COMPASS RESEARCH PREDICTED the market share of portable and laptop computers in Australia would increase by more than 60 per cent next year. This is more than double the growth projected for microcomputers — the total micro market is expected to grow by less than 30 per cent next year.

The forecasting was contained in the Compass third-quarter report for Micro Storeboard. Compass Research analyst, Ms Jo-Ann Booth, said laptops and portables had come from a 3 per cent market share in the first quarter to a projected 11 per cent share in the fourth.

"This increase is the beginning of a major shift in personal comput-

ing, both in DP and home environments," she said. She is predicting that by 1988 there will be "a convergence of portable and personal technologies".

Laptops and portables are already, in many cases, playing the role of the desktop, Ms Booth said. According to Micro Storeboard, laser printers outsold daisywheels for the first time in August — by more than 60 per cent (400 compared to 250)!

Hewlett-Packard, which was early into this market and has a wide range of models and a bigger dealer base than other contenders, has more than 70 per cent of the market. But, Compass said, NEC and Epson could give HP a fright when their new products start to influence the market early next year.

The market for portables and laptops is apparently very price-sensitive; Compass said no-one was prepared to pay more than \$3,000 for a machine. The IBM Convertible, for example, has met with limited success — at \$4000 it was above the acceptable end user price.

Compass also released results of a survey of the state government computer market, which it said could not be ignored by any vendor since it was 12 per cent of the total Australian market and growing at an average 20 per cent per annum.

Compass warned, however, that computing strategies, growth rates and selection procedures differed so greatly from state to state that vendors needed to analyse each independently.

Victoria was listed as the most important state government market, followed by New South Wales, Queensland, Western Australia, South Australia, the Territories and Tasmania. IBM is the largest mainframe supplier in New South Wales, South Australia, Western Australia and the Territories, with IBM and compatible machines dominating the mainframe market overall.

But, Compass said, government users were more inclined to use mainframes from the non-IBM world than their colleagues in commerce. And DEC was named as the preferred vendor for minicomputers in every state except Tasmania and the Territories, with Prime also rating well.

IBM was given as the most popular supplier of micros everywhere except NSW and Queensland, where Apricot and Sperry have carved out large niches.

State government bodies were also asked about the brands of computer equipment they planned to purchase over the next three years. Most States said they intended buying IBM mainframe and microcomputer systems in the future; DEC was still given as the most popular intended minicomputer vendor.

Various departments said service and support were the most important purchasing criteria.



TAS + has no equal

T.M.

TAS - Plus is faster, easier and cheaper. Simply the most advanced database software of the 80's.

TAS - Plus Relational Database gives you everything you need to quickly and easily create your own database applications. It combines the power of a Relational Database and 4th Generation Language with the ease of a built-in Screen Painter and Program Generator. You literally paint the screen and TAS - Plus writes the program for you.

Whether you're a novice or a seasoned pro TAS - Plus is the product that meets your needs no matter your experience or requirements.

Database

- Save up to 65,000 records in one file (limited by disk space and operating system).
- Find any record in a file in less than 3 seconds.
- Number of fields per record is limited only by operating system.
- Up to 254 characters per file.
- Up to 16 files open at same time.
- Up to 16 key fields per field.
- Up to 10,254 characters per record.
- Field type may be alpha, numeric, date or time.
- TAS - Plus Data Dictionary maintains all data file structures in one handy location.
- Dates use only 4 characters of storage.
- Numeric fields stored in BCD format (a 10 digit number uses only 5 characters of storage).
- Numbers can be up to 20 digits long and have up to 8 significant digits to right of decimal place.
- Print reports to screen, printer or disk.
- TAS - Plus program can exchange standard ASCII data with other programs. Convert Dbase III data files to TAS - Plus and vice versa.

Procedural Language

- Up to 4,500 command lines per program.
- Up to 255 named fields per program.
- Key files not counted as open file. All data file keys stored in one index file (opened automatically with data file).
- Powerful B-TREE file structure allows you to search on any one of 16 key fields per record without sorting.
- Up to 16 screen/report formats per program.
- Allows numeric and string arrays of up to 255 elements each.
- Gosubs may be nested 10 deep.
- Up to 10 nested parentheses per expression.
- Structures may be nested 10 deep.
- True recursion capabilities (sub-routine can call itself).
- If command allows true if/then/else programming.

- If comparison types include less than, less than or equal to, equals, equal or greater than, greater than, and not equal to.
- Multiple company capabilities allow up to 1,369 different sets of data files to be accessed by the same programs.
- TAS - Plus has 86 commands (plus several options on many commands).
- Supports date and time arithmetic.
- Context sensitive help messages are easily added to applications.
- Find command can search for exact match, partial match, next record, previous record, beginning of file, end of file or related field between two files.

Compiler

- TAS - Plus compiler converts TAS applications into fast running pseudocode (executable by TAS - Plus run-time).
- Automatically checks program for syntax errors and command usage problems as it is compiled. Helps catch "bugs" before they become problems.
- Automatically checks to make sure files used exist in data dictionary or are defined in application.
- Compiled run-time programs are automatically compacted so they take up less disk space.
- TAS - Plus allows you to create run-time versions of your applications that are separate from the source code (perfect for program developers who intend on selling finished products).

Screen Painter

- Create screens that will look identical to your applications.
- Easily add color or graphic characters to your screen by making menu choices.
- Automatically create programs by "painting" the screen and allowing TAS - Plus to write the program.

Source Code Editor

- Displays all TAS - Plus commands in plain English.

- No need to memorize difficult syntax. The Editor displays all options and makes sure you make all required entries.

Report Writer

- Create and run reports quickly and easily.
- Columns can be totalled.
- Up to 10 different fields may be used as selection criteria in each report.
- Reports may be run over again and again.
- Report programs can be modified using the source code editor.

Other Utilities

- Browse utility lets you display 10 records at once, choosing which fields and in which order to display them.
- Maintain database lets you add change or delete records in a file.
- Create database adds a new database definition to the TAS - Plus dictionary and allows immediate entry of data.
- All utilities are menu driven and require no programming knowledge.

The Accounting Solution

Now solved is the problem of rigidly fixed off the shelf software. Source Code and the powerful TAS - Plus Developers Database are included - so programs can be easily modified as your needs change. Single and Multi User.

Modifiable Accounting

Includes General Ledger, Accounts Payable, Accounts Receivable and TAS - Plus Developers Version. Source code included.

Advanced Accounting

Includes all in Modifiable Accounting plus Sales Order, Purchase Order and Inventory. Source code included.



Developer's Version

For those who need even more power, there's the Developer's Version of TAS - Plus Relational Database. It offers everything that the standard package includes, plus a Programmer's Toolkit. It's the perfect addition for those persons developing sophisticated applications. The Programmer's Toolbox allows the user to access features not normally available on a database/language. Primary among these are the ability to access additional blocks of program memory (up to 96K), to access files using variable file numbers (even if file names are unknown), and to directly

control the memory stack (pop the stack). You can also have up to 17 million records per file and 32 Indexes per record. Developer's Version also includes a Trace Utility that lets you place break points in your source code (for easier debugging). The Trace Utility includes: set break points, examine/change field value, and single step execution and Enter other character to continue normal operations. For those who want to use a standard ASCII editor, the Developer's Version provides a complete cross listing of TAS - Plus commands plus a straight forward method of manually

writing code. This includes a way of incorporating both screens and reports into the actual code. Developer's Version includes these additional commands: binary character close variable file display memory file name search fill memory find rec var file memory ptr update memory space update move string open variable file pop stack print screen ready find field trace enable

TAS - Plus.....	\$199
Developer's Version.....	\$569
(Multi user \$869)	
Modifiable accounting.....	\$999
(Multi user \$1,299)	
Advanced accounting.....	\$1,429
(Multi user \$1,729)	

TAS - Plus comes with a 30 day money back guarantee (less \$25 handling fee). TAS - Plus is available for the IBM PC/XT/AT and compatible computers.

Call our ORDER HOTLINE. Use your Visa, Mastercard or American Express to order today.
Ph. (08) 211 7922.

YES! Rush me the following items				Name: _____
Qty.	Item	Price	Subtotal	Address: _____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____ P/code: _____
Shipping add \$8	Shipping	_____	_____	Phone: _____
Tax exempt No. or add 14% Tax	_____	_____	_____	Send to:
(\$Aust. funds only) Amount Enclosed	_____	_____	_____	Australasian Distributor
Payment: VISA MC AMX Cheque	_____	_____	_____	COMPUTER BUSINESS
Credit Card Expiration Date: _____	_____	_____	_____	SYSTEMS PTY. LTD.
Card Number: _____	_____	_____	_____	217 GOUGER STREET
Name On Card: _____	_____	_____	_____	ADELAIDE
Signature: _____	_____	_____	_____	S.A. 5000

ALSO AVAILABLE FROM T.J.M.'S ADLEF AND OTHER REPUTABLE COMPUTER DEALERS. DEALER, V.A.R. AND O.E.M. ENQUIRIES WELCOME.

THE FOLLOWING ARE REGISTERED TRADEMARKS OF THESE COMPANIES: TAS - PLUS, THE ACCOUNTING SOLUTION, BUSINESS TOOLS, INC.; IBM PC/XT/AT, INTERNATIONAL BUSINESS MACHINES CORP.



GIANT K

Now there's a new standard that all other business computers, whatever their size, will have to try and match.

Introducing the Toshiba T3100 and T2100, the most exciting new business computers in years.

Both the T3100 and T2100 are so fast, you'll wonder how you coped with any business computer you've ever worked with before.

They have greater versatility than either the XT or the AT (and, of course, they **are** compatible).

Both come complete with a superb plasma screen that sets new standards of clarity and definition for desk top computers.

The Toshiba T3100 features internal hard disk storage and an in-built 720KB disk drive. The T2100 offers the choice of either internal hard disk



KILLERS

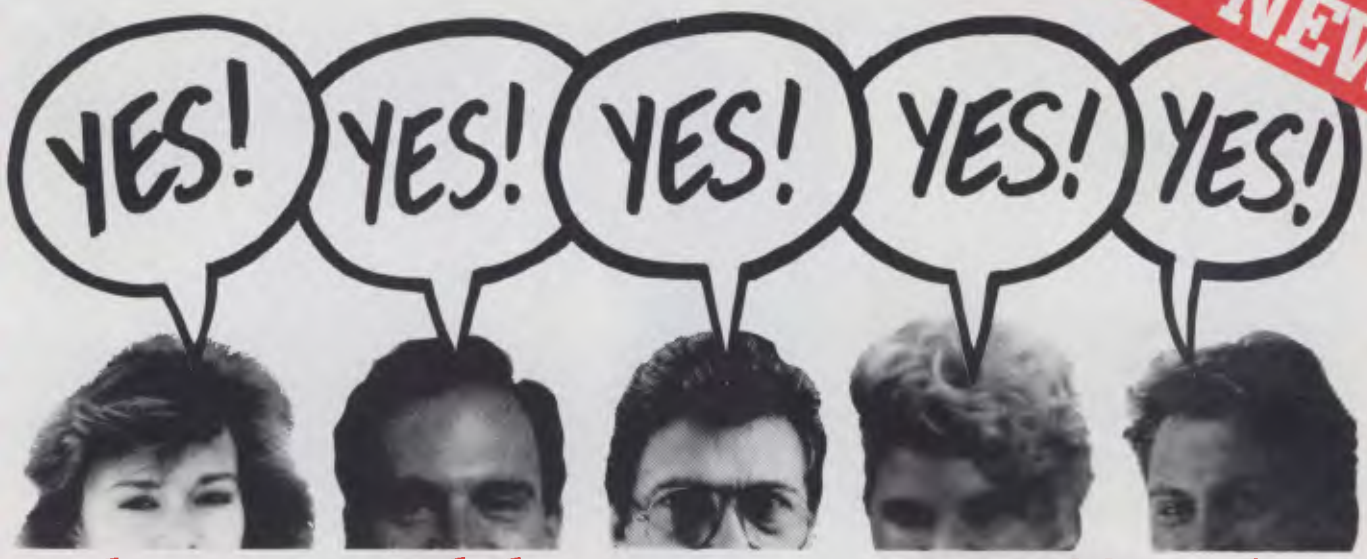
with a disk drive or dual internal drives. And all of this comes at a price that makes all other business computers as over-priced as they are over-sized.

The new Toshiba T3100 and T2100. Probably the most capable little miracles ever to grace your desk top. Or your top desk drawer. And, like all Toshiba computer products, one less thing to go wrong.

TOSHIBA

Toshiba (Australia) Pty. Limited, Computer Products Division.
84-92 Talavera Road, North Ryde, NSW 2113. (02) 887 6057
Conroy Carpenter TCP 0034

NEW!



What would you say to effortless professional presentations?

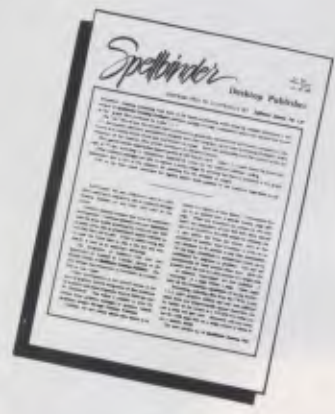
It not hard to imagine the benefits of such, be it your reports, promotional material or whatever. And it's not hard, or time consuming, nor do you require any particular talent. It takes very little time, effort or imagination to produce superbly presented editorial. After all, when you consider how much time you spend writing and compiling your information, it's a pity that it's not professionally presented, especially when it only takes a few minutes. The answer is Spellbinder Desktop Publisher!

The new Spellbinder Desktop Publisher is much more than just a word processor. Desktop Publisher has the distinct advantage of being able to compose pages, using text as well as graphic images from other programs.

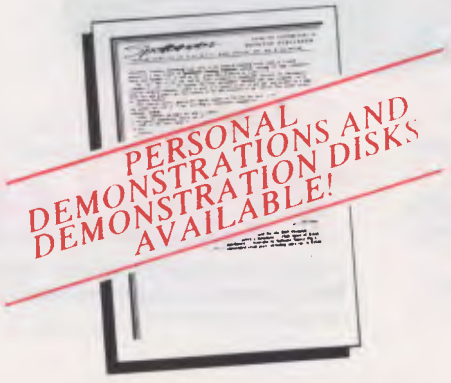
For example, Line, bar and pie charts produced by Lotus 1-2-3 can be read by Desktop Publisher, and scaled to print in any defined area. Other features in the area of graphics include integration of files produced by scanners and paint programs, such as Dacopy and Microsoft PC Paintbrush. This makes it possible to print the output from graphics programs or reproduce custom images, such as your company logo, through Desktop Publisher.

allow specific text to be printed in any style simply by choosing one. It also allows text from any source, such as that produced by another word processor or from an on line database to be printed in any style immediately. On any page, exceptions or exclusionary areas can be established for diagrams or graphics. The text will automatically fit itself around those areas. A "what you see is what you get" view on screen is available at a single key stroke. Both text and graphics are then printed in a single pass at the full resolution of 300 dots per inch by the laser printer.

Spellbinder Desktop Publisher is suitable for the IBM PC and compatibles. The program requires a minimum of 256K bytes of RAM and a graphics display card. The new Spellbinder Desktop Publisher is available ex-stock from Software Express. The price is \$1,420 (Demonstration programs are available.)



Textwise, Desktop Publisher allows style sheets to be added to a library of style sheets. Unformatted text can be poured into a specific format, page after page. While any document can contain its own style sheet, the separation of text and style



PERSONAL DEMONSTRATIONS AND DEMONSTRATION DISKS AVAILABLE!

ALSO AVAILABLE...
BRIEF *The new program editor that everybody is raving about! Brief has all the features most asked for by professionals.* \$410
SMALLTALK V *Explore Artificial Intelligence on your PC with this exciting, new program. A very good implementation of Xerox's research effort.* \$245

SOFTWARE Express

48 A'Beckett Street, MELBOURNE 3000
Phone (03) 663 6580

A GROWING CONCERN

The Minister for Industry, Technology and Commerce, Senator John Button, recently told Parliament our software industry was growing by 50 per cent every year.

The figures were drawn from a government survey which showed that 10 per cent of total software sales of \$600 million during 1985-86 had been for exports.

The industry now employs 16,500 people, but, according to Button, is still dogged by a series of problems, including lack of finance, skilled staff, and a knowledge of overseas markets.

IT WAS THE ZEN THING TO DO

The copyright battle continued on the Lotus front, with Lotus Development Corp knuckling down and agreeing to remove the copy-protection schemes from software it sells to the US Department of Defense.

Lotus will ship special unprotected government editions of Lotus 1-2-3, and will probably also deliver unprotected versions of Symphony and its new technical word processing package, Manuscript.

United States Government regulations require the Department of Defense to purchase unprotected software, so it can be installed on a hard disk and easily transferred.

Lotus is the last of the big three American software makers to deal with the copy-protection issue, since Ashton-Tate and Microsoft recently announced they would remove protection from all future software releases.

NORTY, NORTY

The United States recently claimed Japan has been selling microchips to third countries at cheaper prices than those set in an agreement between Washington and Tokyo.

The two sides had failed to reach any agreement after three days of negotiations on ways to prevent sales of Japanese semiconductors to third countries.

The United States negotiators said Japanese makers were selling microchips to third countries below prices set under a July 31 agreement and, should such a practice be left unchecked, cheaper Japanese products might flow into the United States market through those third countries. They urged Japan to improve its price-monitoring system on its semiconductor exports to outside markets.

In response, Japanese negotiators said there were differences between the two sides in monitoring Japanese makers' costs, and ways to compute their sales expenses.

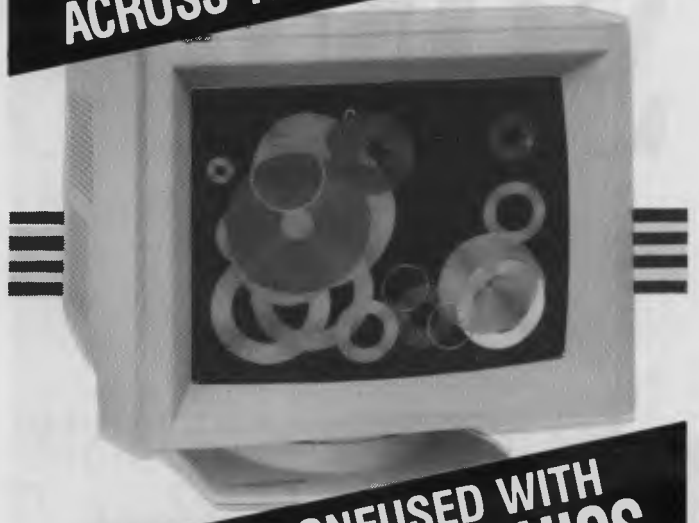
The United States had suspended legal proceedings on dumping charges against Japanese semiconductor makers, in return for promises by Tokyo under the July agreement to prevent sales below "fair" prices.

EHH, WOT'S UP DOC?

Warner Communications has won the lion's share of \$US51.8 million harvested by Atari as a result of its sale of public stock on the American Stock Exchange.

Warner Communications is the entertainment conglomerate that sold Atari to Mr Jack Tramiel in 1984.

NEC HAS EVERY COLOUR MONITOR BEAT ACROSS THE BOARD



DON'T BE CONFUSED WITH ENHANCED GRAPHICS

Resolution : 640x350; 640x400; 640x480;
Scan Freq. : 15.75kHz; 21.85 kHz; 30.48 kHz;

Which board will you buy?
What monitor will it require?

NEC MULTISYNC HAS EVERYTHING YOU NEED IN A HIGH RESOLUTION COLOUR MONITOR

- Automatically scans all frequencies between 15.5kHz and 35kHz.
- Resolution: (max.) 800 dots x 560 lines for superior clarity of display.
- 7 colour text switch.
- Tilt and swivel base.
- 12 months warranty backed by nationwide service.

All from NEC, a name respected around the world for advanced and reliable products.

NEC

MULTISYNCS

The Intelligent Monitor

NEC Home Electronics Australia Pty. Ltd.

SYDNEY 244 Beecroft Road, Epping NSW 2121. Phone (02) 868 1811
NEWCASTLE 120 Parry Street, Newcastle West 2302. Phone (049) 26 2466
MELBOURNE 23 Normanby Rd., Notting Hill Vic. 3168. Phone (03) 544 9200
BRISBANE 49 Colebard St. East, Acacia Ridge Qld. 4110. Phone (07) 277 0888
ADELAIDE 58 Deeds Road, North Plympton SA 5037. Phone (08) 294 9033
PERTH 45 Sarich Court, Osborne Park WA 6017. Phone (09) 445 3499



MUSIC SOUND RECORDING STAGE LIGHTING

SONICS

MAGAZINE

FOR BEDROOM RECORDISTS

The HOME RECORDING CASEBOOK — regular features designed to inform and stimulate, to help get the most out of very basic recording setups.



(02)693-6666

A BAD YEN FOR PROFITS

The Japanese manufacturing industry reported a 24.1 per cent profit decline in before-tax profit during the April-to-September period, which it attributed to the sharp rise in value of the Yen.

Export-oriented industries were particularly hard hit, with leading electronics companies showing a plunge in profits because of declining exports and semiconductor prices.

Meanwhile, electronic equipment maker, Hitachi, predicted a serious 42 per cent pre-tax profit drop for the business year ending next March.

PCS FAIL TO REACH THE TOP

A study by the Stanford University Graduate School of Business said American executives were using PCs more, but that the PC had failed to find a place in the top levels of the country's biggest corporations.

Chief executive officers and company presidents were said to be using computers primarily to review management reports. Chief financial officers and marketing executives use theirs for analysis, forecasting and other decision-making functions.

BURROWS + SPERRY = UNISYS?

A 36-year-old Burroughs Corporation employee, Lee Machen, won \$5000 for choosing a new name for the giant United States company created through the merger of Burroughs and Sperry. The two companies agreed to the \$US4.8 billion merger five months ago.

The name — Unisys — was selected from 31,000 entries from the 120,000 employees of the combined worldwide Sperry-Burroughs organisation.

Its announcement by Chairman Michael Blumenthal marked the end of months of speculation, and was accompanied by

the launch of a \$25 million advertising campaign aimed at creating a new image for the born-again company, now the second biggest computer maker in the world after IBM.

Major restructuring of the conglomerate, announced during November, includes plans to sack 10,000 employees, mostly from administration areas; the decision by the Sperry division to sell its aerospace operation to Honeywell, for \$US1.03 billion; and the decision by the Burroughs division to hive off part of its Memorex subsidiary.

Commenting on the aerospace purchase, Sperry's chairman and chief executive, Edson Spencer, said, "This important acquisition will make Honeywell an important supplier for the cockpit of the future."

The sale, for US\$550 million, of part of the Memorex subsidiary will create a new company for a group of Memorex executives and a New York investor. Their purchase includes the worldwide plug-compatible (PCM) sales and service organisation, the communications engineering and manufacturing organisation and the media-products business. Unisys retains "key technologies", the Memorex headquarters in California, the design and manufacturing operations for large disk drives, and all other operations concerned with the manufacture of Unisys peripherals.

The new company, with 6000 staff and estimated revenues of \$900 million, will continue to use the Memorex name.

NOT QUITE WORDPERFECT

In our November issue, we misquoted the price of the Wordperfect word processing package. Our apologies to those of you who took Les's advice and rushed out to buy the product, only to be surprised at what it cost ... Will the real price please stand up ... It's \$870 — and Les says it's still well worth it. □

EXPO IN THE SUN

WHEN THE DOORS CLOSED on the Fourth Annual Queensland Computer Expo, exhibitors declared it to be the most successful yet — and took it as a hearty sign that the computer industry is alive and well in the Sunshine State. Over 13,000 visitors were attracted by over 70 vendors during the exhibition's four days at the Mayfair Crest in Brisbane in early November.

Contrary to the gloomy predictions that are rife in the local industry, exhibitors reported healthy sales and a very high level of general consumer interest. Attracting an especial amount of interest were the new desktop publishing systems launched by Apple Australia and local-manufacturer President Computers. IBM compatibles featured strongly with the latest on show from Amstrad, Hypec, Multitech and Queensland's own Cleveland Computers.

Local dealers Pacific Data and Kaye and Associates reported strong interest in demonstrating their CAD packages and hardware — especially amongst small businesses, showing that this is another software area that should soon be accessible to the general user.

As the organizer, Robert Woodland pointed out, the number of 'first releases' at the show, indicated that the Queensland Computer Expo has become a major event on the industry calendar and the 1987 show (Mayfair Crest, Nov 4th to 7th) — the 5th Annual — will be even more successful. □



AMERICAN GRAFFITI

BY HOWARD A. KARTEN

I SAT DOWN at my word processor fully intending to tickle the ivories, as it were, when my combination database syntax-checker and pop-up calendar checked through past columns and reminded me it had been some time since I banged my spoon on my high chair.

Some experiences I've had recently cause me to wonder about the value offered users by some computer-connected products and services. For example, there's an American service called Newsnet, which offers on-line access to some conventional (though highly priced) newsletters. In an effort to familiarise potential users with its service, Newsnet recently offered a day's access to it, entirely free. I took the company up on it and spent a day downloading around 1.5 megabytes of information. (That's right — 1.5 megabytes. At 1200 baud, and with only occasional pauses to input or output coffee, it took several hours.)

I'm sad to have to relate, most of these newsletters were boring. Almost all were expensive in hard-copy form, and priced even higher in electronic form. Several simply reprinted the press releases vendors use to communicate with the media, and there seemed to be an awful lot of "I" in them. (One editor, famed mostly for his ego, has taken to writing 'open letters' to various vendors, telling them why they are having problems.)

On the same day, one of my favourite newsletters arrived in the mail. It costs only \$10 for six issues, and covers the communications hacking-and-crime scene, and is consistently one of the most interesting publications I know of.

In another recent case, I enquired about the price of additional memory chips at the local

store, which is part of a major regional chain of computer stores. These stores are aimed at business computer users, and strive mightily to be non-intimidating to would-be customers.

I had called to test a hunch — that the folks in the store had little or nothing in the technical knowledge department. The store I called proposed to charge \$30 for a set of nine memory chips; the price through mail-order is around \$9. Normally, a store's justification for charging 'full price' is that it (the store) somehow adds value to the product. In this case, apparently, the 'value added' is that the staff doesn't bother the customer with silly stuff like technical specs: I had to speak with three employees before I found one who had any idea that chips have rated speeds, and that chips rated at the incorrect speed would not work.

We've all experienced this kind of ignorance and lack-of-value so often, and heard similar tales so frequently ... I'm convinced it must be a world-wide phenomenon. It almost seems as though there's some sort of inverse-square law (remember those from high school physics?) governing what's happening: as the price of software and hardware go down, the amount of ignorance surrounding them seems to be rising in squared proportion.

In the good old days, a lot of computerstuff was sold by unkempt hackers who knew all manner of technical arcana, but little about sales. How far we've come in just a few years ...

THAT'S SERVICE!

A communique recently received from IBM contains an interesting commentary on computers and electronics — and possibly on

IBM as well.

IBM is dropping prices for maintenance of IBM PCs — in some cases, significantly. And the prices apply even to older IBM hardware. The move is significant for several reasons. First, it's a bottom-line commentary on how (apparently) reliable IBM hardware is. What IBM is saying is that even older hardware — the Dsystems put together at the beginning of IBM's manufacturing cycle, when, presumably, it was still riding the learning curve — has withstood the ravages of aging with some grace.

Why did IBM do it? I find it very curious (though, I hasten to add, not at all sinister). IBM is very much bottom-line oriented, probably more so than many other companies. And it undoubtedly knows better than anyone else what the failure rate is on all its products. And, although IBM does lower prices for competitive reasons (and probably only for competitive reasons), it's hard to imagine that the company felt beset by its competitors, or that it hopes to generate business by lowering prices. Another IBM mystery.

TO MARKET, TO MARKET

One of the more consistent phenomena of the microcomputer era has been the demise of companies attempting to compete with Big Blue. Corona, Eagle, Hyperion, and a score of others have gone under in the PC-compatible arena. And the classic reasons for failure (under capitalisation and poor marketing) are not committed only by small companies; as I mention elsewhere in this column, AT+T has not fared especially well against IBM, either. And AT+T is nothing if not a) an organisation with a

well-deserved reputation as marketeers, and b) well-financed.

These musings come to mind because of announcements of microcomputers by two companies which have thus far done well in this business. NEC Home Electronics (USA) recently introduced an under-\$2000 MS-DOS-compatible portable with an LCD screen and two 9cm floppy drives. (The machine, called the MultiSpeed, uses NEC's proprietary V-30 chip.) And AST Research introduced a machine it's calling the AST Premium/286, an Intel 80286-based machine which operates at 10 megahertz and has all sorts of Dgoodies (12-month warranty, attractive price, lots of factory-installed memory).

It will be interesting to see, six months from now, whether these two vendors have succeeded in securing a healthy share of the compatible, marketers market.

SHORT BYTES

■ Maynard Electronics of Caselberry, in the state of Florida, recently announced a disk controller card which the company says will double the capacity of many fixed disks now in use. Maynard plans to release a list of drives compatible with its product, but has not yet disclosed the price.

■ A recent court decision in San Francisco may spell trouble for would-be developers of software clones — software that 'looks' the same (that is, presents the same user interface) as original software. A Federal District Court in San Francisco held that a clone of Broderbund Software's Print Shop graphics program violated Broderbund's copyright. Lawyers for Unison World, the company which lost the case, said they would appeal. □

Toshiba's new PC portables really mean business

The ultimate PC lap portables from Toshiba

Toshiba's revolutionary new lap portables provide performance superior to desktop PCs. Their unique square format plasma displays provide viewing ease and resolution superior to conventional monitors.

Toshiba T1100 Plus

The latest version of this battery powered portable has a superb new liquid crystal screen, more memory and a faster processor.

- Functionally IBM PC/XT compatible



BATTERY POWERED

- Switch selectable 7.16/4.77MHz processor
- 256K RAM (expandable to 640K)
- 2 x 720K 3.5 inch floppies

Toshiba P351 /351C

You get letter quality at dot matrix speeds with Toshiba's new P351 3-in-1 printer. An incredibly fine 24 pin head enables the Toshiba to produce letter quality type at 100cps or draft quality at a staggering 288cps.

Fully IBM PC compatible, the P351 is ultra quiet, making it perfect for office environments.

FINANCE AVAILABLE

SANT TECHNOLOGY



Toshiba T2100 IBM PC/XT Compatible

10MB HARD DISK AVAILABLE

- * Superior 8086-2 processor
- * 256K RAM standard, expandable to 640K
- * Twin 720K 3.5 inch drives (1.4MB total)
- * Plasma display 640x400 pixels
- * Parallel, serial, RGB colour port, clock/calendar and an expansion slot

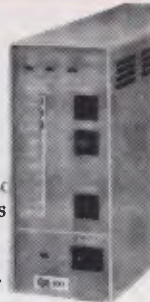
PRINT BUFFERS

SP100 Series Print Buffer/Switchers

Reduce "printer bottleneck"

The buffers hold up to 144 pages of text from up to 3 computers. A printing job which would hold up a computer for 23 minutes is accepted by the SP100 in just 13.5 seconds!

- * 3 computers to one printer
- * Centronics interface
- * Data input 4,800 bytes/sec



NEW QUBIE BT20 HARDPACK

Slot mounted 3 1/2" 20 megabyte hard disk and controller.

\$1245.00

NEC 40MB Hard Disk and Controller

Superior quality and reliability 12 months warranty. **\$1845.00**

Mountain 60MB Ext. Tape backup \$2984.00
CYPHER 20MB Tape backup Call

Note: all drives carry full manufacturers' warranties.



Toshiba T3100 - Desktop AT Power, Desktop AT Power,

* Fully functional Toshiba Style!

- PC/AT compatible
- * Superior 8MHz 80286-2 processor, switchable 8/4MHz
- * 640K RAM, expandable to 2.6MB on the system board
- * 720KB floppy drive
- * Integrated 10MB hard drive
- * Plasma display 640x400 pixels
- * Parallel, serial, RGB colour port, expansion slot



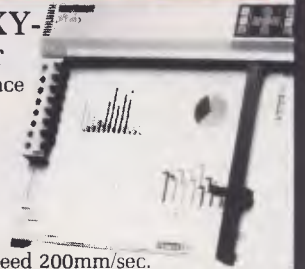
PLOTTER

Roland DXY 880 Plotter

High performance at low prices.

DXY-880 produces professional 8-colour graphics

- * Fast. Max. speed 200mm/sec.
- * Software compatible with Lotus 1-2-3, pfs Graph, BPS and many other programs.



COMPUTERS

We stock IBM PC/XT, NEC APCIV and Olivetti.

HARD DISC DRIVES

Tandon 42 Megabyte	\$2395.00
Toshiba 86 Megabyte	\$3480.00
Control Data 86 Megabyte	\$4385.00
Control Data 30 Megabyte	\$2186.00
Maxtor 119 Megabyte	\$7156.00
Mountain 60MB Int. Tape backup	\$2786.00

Please send further information on

Name _____

Company _____

Address _____

Phone _____

Sant Technology Phone (02) 597 2355, (02) 588 1913. Suite 3, 58 Bay Street, Rockdale, NSW 2216. All prices * Include sales tax * Subject to change without notice * Do not include delivery. Quantity discounts available. Many items are not listed, please call for specific item.

People are always asking us what we'd buy — what hardware, what software, which bits and pieces? Well, when the dog bites, when the bee stings, when money's burning a hole in our pockets or a third mortgage looks like a good idea . . . there are some things we'd kill for. And, of course, there are many indispensables we've already bought — with past mortgages. So, these are a few of our favorite things . . .

Matt 'Go-Faster Mastermind' Whelan

I HAVE HUNDREDS of favorite pieces of compuphernalia, but most of them belong to someone else — like several of the high-performance ATalikes we've reviewed, wondrous graphics and music machines, hotrod 386-powered devices like the Compaq, or even zippy laser printers like the 26-pages-a-minute Dataproducts LZR 2665.

When we get down to the things we own

(yes, we *do* buy things) there are still quite a few — the always-excellent Compupro 286 systems we drive at work and home, the versatile Hardcards that make our travelling life so much easier, the cabinets filled with public domain software collections that hold the answer to most programming questions, and the superb software (we wrote it!) that organises our lives (as much as they can be . . .).

So what makes it to the 'final five' list? Mostly things we own and use every day, plus a couple of 'desirables' from the test items that have passed through the office lately.

Impact's Wisdom

Our Impact laser printer has proved one of the most welcome high-tech additions to

the YC office in recent years.

The speed and quality of laser printing are well known — and in themselves justify the purchase — but there a couple of factors which are less-often recognised as advantages. The most significant, as far as we are concerned, is the noise level — there isn't one! It's not unusual to see one of the staff walk to the printer with hand cupped behind ear to see if it's working.

Occasionally I sit back and watch an article or program listing being ejected at eight pages a minute and think of the days when the high-pitched scream of a 'letter-quality' dot matrix printer used to interrupt my phone calls. Or of the times our Diablo daisywheel sent visitors diving to the floor with its takatakatak-machine-gun clatter.

Favorite Things

I remember, not at all fondly, the extra problems introduced by the expensive sound-proofing hoods we eventually had to buy — the folding and jamming of paper, the problems of paper-feeding generally, and the sheer space-eating bulk of the unsatisfactory combination.

Our machine started life as a Hewlett-Packard Laserjet, but we quickly converted to Impact Systems' controller board, as it allowed far simpler control and drastically increased flexibility with fonts. Whether that was the right move in light of coming desktop publishing developments (a subject dear to our hearts) remains to be seen, but in the meantime the Impact has served us in an outstanding manner...

PC Screen, Real Computer!

We've held out against the IBM march (in our own work, not the magazine) for a long time, running Compupro machines which provided speed, reliability, disk capacity, multi-tasking and multi-user operation, but there were a few problems.

Every now and then we'd need to run a PC-based application, so we would have to switch to using an IBM (or near offer). And people would often challenge our praise for the Compupro by asking "Can it run Lotus?"

Mr Compupro solved our problems this year, with the PC Video Board, an S100 'IBM clone'. It slots into our machine and, with an IBM keyboard and monitor attached, becomes the system terminal. Now — thanks to the video board and the Concurrent DOS operating system — we have our cake and large tummies, too. We run up to four PC-dependent tasks at once on this console, and still have our multi-user operation and all the other benefits.

We can run DOS-based software on our serial terminals as well, but use the video board for applications which want to drive a PC screen directly.

Now, when people ask, we can show them Lotus running on the Compupro. We never use it, of course, but keep a copy there for the infidels...

Clipper Has Wings

We love dBase. We love it despite its problems, despite the evil things it has done to us, despite the four-in-the-morning shouting, screaming, swearing sessions in which we beg for five minutes alone in a dark alley with author Wayne Ratliffe.

We love Clipper because it takes dBase III programs and makes them into standalone applications that do all the dBase



things without the dBase sluggishness.

Clipper is a dBase compiler (many say *the* dBase compiler) — it takes the text files of instructions that make up a dBase program and turns them into directly executable machine code. Once you've done that you don't need dBase any more (in fact, you don't need it to start with), so you can sell, lend or give away your programmed systems without the recipient having to buy a copy of dBase.

Clipper also has extra features over the product it 'clones', so finally we can do useful things with one of dBase's biggest features, the variable-length memo fields.

In case you were wondering, our Clipper-compiled systems run, on average, three times faster than the same system running under dBase. Heavily processor-intensive applications involving loops can run up to 100 times faster!

NEC's 'Mazing Multisync

The man from NEC home electronics recently talked us into looking at his latest monitor, despite our disinterest. He was right, and now we want one!

We loved his new multisync monitor (model JC-1401P3E/EE/R, or "The Intelligent Monitor" for short). For those who haven't run into the problem it solves, we should mention that the various standards of IBM graphics cards — the Colour Graphics Adaptor (CGA), the Enhanced Graphics Adaptor (EGA) and the Professional Graphics Adaptor (you guessed it, PGA) — run at different frequencies, and require different monitors. Switching graphics cards can turn out to be an expensive pain.

The NEC multisync automatically scans all the frequencies from 15.5 KHz to 35 KHz, and adjusts itself to suit. It offers resolution of 800 by 560. It's just the thing for moving from machine to machine, as we often have to do.

It offers both TTL and analog inputs,

and has a Text Switch which allows a choice of one of seven colours for a monochrome word processor or spreadsheet display. The screen is a crisp, clear 36 cm diagonal, with a large viewing area.

It's just the shot for buyers who want high-resolution graphics from packages like Autocad and so on. Unless you're convinced you'll never need graphics, you should be investing in an EGA card and a monitor like this, straight off. If nothing else, it makes the IBM easy on the eyes instead of the 'ugly' provided by the CGA.

Make Pages With The Multisync

The NEC monitor is just the shot to go with our next 'desirable', the IBM version of Aldus Pagemaker.

Pagemaker is a long way out in front in the desktop publishing market, but so far has been available only for the Apple Macintosh. We have one of those (thanks to Les Bell, who traded down from his Lisa), but it tends to get overworked...

We want PC Pagemaker, and we want it now! It's great fun (we have a pre-release version to play with, so we know), as long as you run it on high-performance hardware. It really needs processor power and disk speed because the IBM, unlike the Mac, has no inbuilt graphics support — the CPU has to do all the work.

The ideal Pagemaker set-up is a fast AT with a RAM disk and an EGA card — at that level, it leaves the Mac for dead. And we're talking about a version of Pagemaker which hasn't been seen on the Mac yet — it includes kerning, hyphenation and other vital but previously unsupported features which kept desktop publishing out of the 'professional' league.

On the IBM, Pagemaker also shows a double-page spread at a time — just what we need for magazine work.

Okay, Aldus distributor (whoever you are, and if the war is over) — we want PC Pagemaker NOW! □

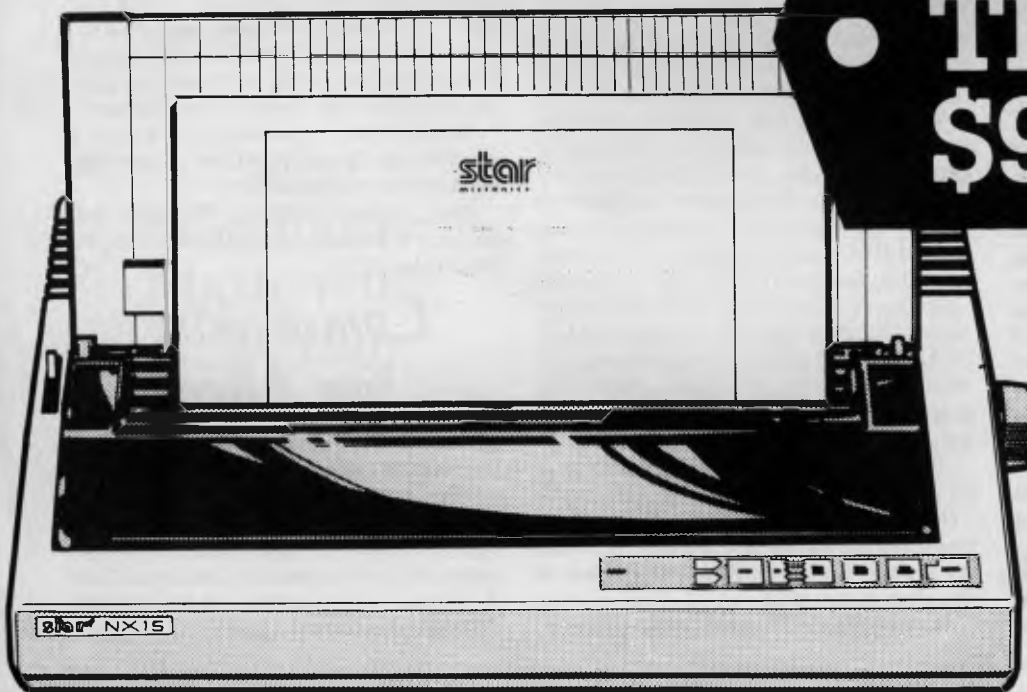
'Commodore' Ian Allen

MY FIVE MOST useful computer purchases? Hmm. I guess number one would have to be the humble Commodore 64. (Sure, I own one, so I'm biased, but on the other hand I'm still using it after four years). Why? Because the C-64 is a bit like a Toyota. It's no sports car. It's not designed to be driven on the limit, but as a

YOU WILL GET MORE THAN YOU BARGAINED FOR.

For under \$900, The Star NX-15 gives you real throughput speed and heaps of features. You get Star's famous touch-control operation, auto paper feed, push tractor feed, (short form tear bar, multi-font), Near Letter Quality printing plus a print buffer that lets the computer get on with the computing. The Star NX-15 is undoubtedly the best value on the market. See it and the entire Star range.

Phone for the location of your nearest
Star Dealer.



**LESS
THAN
\$900.***

DISTRIBUTED BY:

Star Micronics Pty Ltd.
Unit 7, 25 George St, Homebush,
N.S.W. 2140, Australia.
Phone: 736-1144. Telex: AA 73872
Facsimile: 736-1032.

star
MICRONICS

* The Suggested Price of the Star NX-15 is \$849, plus Sales Tax if applicable.
The Price is correct at the time this magazine went to print.



practical everyday tool it's got all of the right qualities. It's inexpensive, it's reliable, and it's got tons of support.

A lot of writers dismiss the 64 as a toy — something only useful for playing games. It does have a big weakness in that its disk drive access is slow. In its standard form it's not suitable for extensive database use, but there are 'hot-up' kits which will fix the problem if that's what you want to do. As a games machine it's *excellent*. It's got a very good combination of graphics, colour and sound — qualities which have been well exploited by software developers. The other big plus is that 64 owners not only have a wide choice of games, they usually get them sooner — the 64 version is invariably among the first to be released.

Several of my friends have recently become first-time computer owners by purchasing an Amiga. They wax lyrical about its animated graphics and music (not much talk of games), but when I ask them what they are using it for, the standard answer is always 'word processing'. I have to agree with them. I've always found word processing to be the most consistently useful thing I do with my computer, but I've done all of mine on the 64, with a complete system which cost about a third of that of an Amiga!

Porsche vs Toyota

That brings me to my second 'best' buy, the 'Easyscript' word processor. It's also in the Toyota mould. It's not the most feature-packed word processor around, but it's got far more features than I would ever need, with perhaps one exception — a spellin checkka. Easyscript retails for around \$30, and in my experience is totally bulletproof. I've never had any reliability problems with it in four years of constant use. It's well documented (I wrote my first page after half an hour), and it supports all the useful things like pagination, left/right justification, search and replace, move text, center, underline and so on. It can hold about 10 A4 pages in memory, but it's possible to chain files together to write a novel if you like!

Easyscript even has a preview option, so you can see what your words of wisdom will look like before you print them out. It is not brilliant at mailmerging, or at tabulating columns of figures, but these are features I rarely need. Why buy a Porsche when you only need a Toyota?

My third best buy is probably my greatest folly. It's a game, but no ordinary

game.

I have probably wasted more hours of my life on this game than any shrink would declare sane. It's called 'Reach for the Stars', and was developed by an Australian mob called the Strategic Studies Group. (Which is why it's one of the few games that cost less here than in the United States.) It's a space strategy game, in which you explore star systems, colonise and develop planets and so on. The only catch is that you're not alone; there are three other players, usually managed by the computer, but they can be played by humans as well.

Invariably there is conflict over who gets what in the space stakes. That's where the strategy comes in. What makes it so compelling is that the computer players employ 'expert system' software. They are smart. They anticipate. They react. But they don't have any special advantage; they play with the same resources and by the same rules as you do. Each game is different because the universe is randomly created, but you can add and remove a variety of features to create further variety. For example, you can vary the intelligence of the computer players; you can change the economic cost of things like starships or factories; and you can vary the length of the game and you can assign different weights to the factors that are counted in the victory scores.

I've owned this game for two years and I'm still playing it. That makes it \$45 well spent. Reach for the Stars is available in versions for the Apple II and Commodore 64/128, and SSG is now developing a Macintosh version.

Item number four on my modest list of favourites is a modem. I bought the Cicada 300 about 18 months ago. It's a 300 baud, dumb modem, and has since been superseded by a Viatel-capable version. I'm still happy. My modem has opened up a completely new world of communication. It's absolutely fantastic to be able to ring up a bulletin board and leave a message asking for help on a particular problem. Nine times out of 10 someone has come across the same problem and has the answer. I also find it satisfying to be able to use my experience to directly help other people. Telecomputing can be a very rewarding pastime, and you don't need to be on Viatel to reap the benefits. Just find

yourself a local bulletin board! (Larry Lewis gave a good run down on Bulletin Boards in his column 'The Prophet Speaks' in our October and December 1986 issues.)

Club Bit

My final favourite thing stems from the same sorts of social tendencies that make owning a modem so exciting. There is only so much you can do by yourself. If you really want to get the most out of a computer you should join a club. Most of them are cheap to join — around \$30 — you'll meet other people with similar interests and problems, and you will learn a lot of short cuts. Most clubs have heaps of public domain software, utilities and people who can advise on the merits of different hardware and software. As with bulletin boards, you'll get much more out of a club than you put in, but if you can contribute just a little you'll be doing your bit to keep the whole process going. □

Tim 'I've-Written-a- Book-About-It' Hartnell

IN 1985 I STRAYED from the straight and true path. After years of spending my days tapping on the keys of my IBM PC, I succumbed to the lure of Apple, and bought a Macintosh and Laserwriter.

Without doubt, of all the computer products I used in 1986, the Mac stands out as the most important for me. Shortly after it was launched, I saw the Mac in operation at the West Coast Computer Faire in San Francisco. Although I duly admired MacPaint in operation (the model we were allowed to play with had been set up with 'brush mirrors', which meant it was extremely easy to produce kaleidoscopic designs), I was struck by the fact that the Mac was a 'closed box'. Just like you'd prefer the crummy little cubby house you were able to build for yourself as a kid, in preference to the much more professional one your dad could build, I felt then that a computer which was virtually impossible to program (when the Mac was launched, there were no higher-level languages available for it at all) was not very inviting.

Forum a User Group?

(Sinclair users take special note!)

JUST ABOUT THE MOST frequent request we hear from readers is a variation on "How do I contact a User Group?" They may be having a problem with some esoteric version of software, or maybe their computer doesn't want to talk to their second-hand printer, or maybe they just want to explore the possibilities of computing . . . They all come down to the same thing: How do I contact other computer users with the same interests and problems as mine? How do I get the most from what I've got — software, hardware or just an idea?

In most cases we can offer help in the form of a referral to a specific user group — we currently have over 800 on file (and, more interesting — they're on the YC Bulletin Board, (02) 953 8074). In fact, we can't think of any more appropriate advice to give — no dealer or distributor can offer the wealth of practical experience that even a small group can build up over a short time (or be so much fun).

What are we on about? Just this — We'd like to offer Your Computer magazine as a venue for your group to address other groups (and, of course, the 100,000-plus readers who aren't members of any group). If you've got something to say that might be of interest to a wider audience than you'd normally reach — a nifty solution to a problem, a fudge around a software bug, a great little utility, or a useful bit of home-grown hardware — or maybe you've got a problem that you know damned well someone else has already solved . . . but how to contact them? Get the idea? Short articles, quick-and-easy projects, questions, answers . . . and we'll even tolerate a bit of someone else's editorialising. The pages we are offering will be what you can make of them — and we think they're going to be interesting! (Any suggestions for a title for those pages?)

Start thinking about it now because we'd like to get started as early in the new year as we can. Send your ideas to User Groups, Your Computer, PO Box 227, Waterloo 2017 NSW — refer to the Services page for details on submissions for publication.

And we did say Sinclair . . .

And what prompted all this, you might well ask? And you might guess it was one of those reader's enquiries, only we don't know of any group to refer him to so . . . Vadim Kuchin is interested in forming a Sinclair QL User Group in the Sydney area. Right now he'd like to hear from anyone interested in exchanging ideas about forming the group and deciding what direction it should take; any suggestions for a venue would be welcomed, too. Got a Sinclair you'd like to get more out of? Then, drop him a line: Vadim Kuchin, PO Box 729, Parramatta 2150 NSW — now! (Please include a SAE envelope for his reply.) And by the way — he told us about a group in WA: The Australian QL User Assoc, 12 St Michael Tce, Mt Pleasant 6153 WA; Graeme Ashford is the Secretary.

Favorite Things

#&*(E)@*||

But now, with lots of programming tools, and the fact that virtually all Mac software follows a common set of rules, so you can run most of it, to some extent, without even opening the manual, the Mac is almost a total joy to use. I say 'almost' because I feel Apple has made a serious mistake with the keyboard. In contrast to the lovely clackety-clack of my PC keyboard, I feel the Mac keyboard is soft and squishy, and it is too high off the desktop for proper use. I fear it was designed by the RSI Promotion Board. And this is not just my opinion. I belong to the grandly named Society of Technical Communicators, and when I voiced my opinion on the Mac keyboard at one meeting, a chorus of agreement arose.

But despite the keyboard, the Mac is a great machine. For general business use, I feel most people would be better to buy an IBM clone, but for specific uses — most obviously in the graphics/desktop publishing area — the Mac is number one in my book.

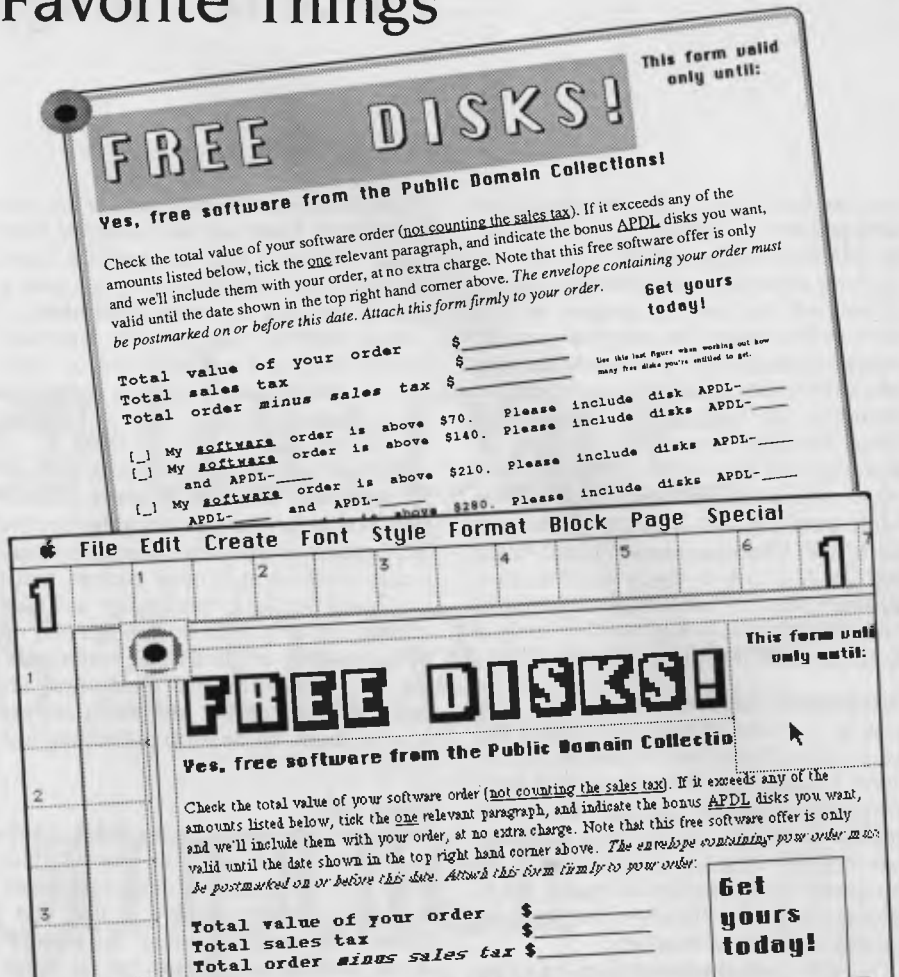
My second favourite product for 1986 would have to be the Laserwriter. It's an expensive beast, but the output is magnificent, and I recouped at least half the cost in the first six months of owning it, partly through typesetting which I did myself instead of paying someone else to do it, and partly in the typesetting work which came my way virtually unsolicited.

PCMac

My third favourite product for 1986 is related to the Mac, and my feelings about its keyboard. The product is called MacLink. It consists of two disks (one for the Mac, and one for the PC), and a cable to join the Macintosh and PC together, and is used to transfer files from one machine to the other. I have a great deal of text created in Wordstar on the PC, which I like to be able to manipulate on the Mac, adding different-size type, and so on, before printing it out on the Laserwriter.

Because I don't like working on the Mac keyboard, whenever I have a project which is more than one page long, I write it on the PC, where I can work swiftly, with proper control, and without being forced to take my hands off the keyboard to manipulate the stupid mouse just to erase a line or move a paragraph to a new position. It takes only a few minutes to transfer a file from the PC to the Mac or vice versa.

When I bought MacLink, I expected it would be a pig to actually get going. Set-



YOUR COMPUTER DESKTOP PUBLISHING

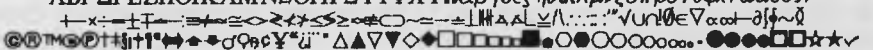
Yes, now that hardened old hacker (as he was unkindly described in a recent issue of the magazine), Tim Hartnell, leaps into the waters of Le Print, just for

Your Computer

Showing off its skills, Mr Hartnell printed the following samples of various type styles:

Natalie
Les Bell
Matt Whelan
JAKE KENNEDY
Leo
Bamien Prins
Federal
Publishing
Your Computer
Rules
very O.K.

Le print also caters for Greek, Mathematical or Special characters such as
ΑΒΓΔΡΕΖΗΘΙΚΑΜΝΞΟΠΡΣΤΥΦΧΨΩαβγδεζηθικλμνξοπρστυφχψωαδδςω



Favorite Things

ting baud rates and getting the package to work properly would take me, so I thought, an afternoon of frustration — such has been my experience with similar products in the past. But no. The program worked the very first time. I left everything on the default settings (with a transmission rate of a quite respectable 9600 baud), and just clicked on the 'Go' box on the Mac — and it did. The data transmission is, in my experience, 100 per cent accurate; I do not recall even a single letter being garbled while travelling from the PC to the Mac, or back. After Wordstar, MacWrite and Ready Set Go, MacLink is my most often-used software. MacLink was created by Dataviz, and is distributed in Australia by Software Corporation of Australia, (03) 699 7255.

Integrated Goodies

Just as MacLink worked first time, I had good luck with my next 'choice product'. In 1986, I bought my PC a present, a complete modem/access package from Information Solutions. The Microtex 666 package was just what I was looking for — an integrated set of goodies to enable me to access Videotext, Microtex 666, bulletin boards and other computers.

I couldn't face the hassle of trying to decide which modem and so on to buy, and then have to try and get the thing working, so the Microtex 666 package seemed a godsend. For around \$499 (the BBC Micro version is the same price, and the Commodore 64/128 package costs \$100 less), I got the following: a natty little extension phone (one of those with push-buttons built into the handpiece, so it's all one unit); a modem (allowing access at 1200/75 to services like Viatel, and 300/300 for talking to other computers); cables; software to drive the thing; and a year's subscription to Microtex 666.

The software converts a standard PC into a videotex terminal, with an additional program provided to enable communication with other computers. Two display modes are provided. One gives full seven-colour foreground/background, flashing and conceal, but with limited graphics (an optional ROM is available to give full graphics in full colour). The second mode is a full implementation of all Viatel features, including double height, flashing and so on, with continuous graphics in restricted colours. The software download facility is fully compatible with Telecom's Viatel Telesoftware Recommendation, as implemented by Microtex 666, which allows the downloading

of text or executable programs of any size from Viatel. There are two hardcopy functions, with a full high-res graphics dump for GX80-type bit-map printers, and a speedy text-only dump for all printers.

If you wanted to get into the communications field, you may well find, as I did, that the Information Solutions package is a simple and neat way to do it. Information Solutions is on (03) 419 0300.

My final two favourite products are both software, and relate to graphics production; one is for the Mac, the other for the PC. Despite all the excitement over Page-maker on the Mac, I must confess that I use Ready Set Go for preference, as I tend to produce fairly short documents (say up to four pages); or I find that I prefer working with MacWrite and then physically pasting up my output afterwards (this is how my book on desktop publishing was done).

More Ads

Ready Set Go is great for producing advertisements, newsheets and so on. Like most other Mac graphic design packages, it is easy, almost intuitive to use, and I found little need to consult the manual. When working on a Ready Set Go document, you create a series of text, frame, or solid rectangles, putting text or patterns in them as you wish, and overlaying them to almost any degree of complexity. Although some complicated documents take a long time to print (I did a newsletter which took 25 minutes for the first page to appear from the Laserwriter), subsequent copies pour out rapidly, one after the other. Ready Set Go is distributed by Imagineering, (02) 662 4499.

My final favourite is Le Print, a means of producing 'typeset' output from Wordstar files (or straight ASCII files) on a dotmatrix printer. You simply embed 'dot commands' in the document, and it prints up in quite adequate quality (as the sample, which was produced on the IBM Graphics — an FX-80-type dot matrix printer, shows) in a variety of typefaces, and in virtually any size, from a fraction of a centimetre to around 25 cm high. The proportionally spaced text can be flush right or left, and a wide variety of other printing control options is available.

The basic Le Print package costs \$310.80, which includes five fonts. Additional fonts are \$38.40 each, or you can buy all nine at a discount of 20 per cent. The optional typestyles include Liquid Crystal Display, Old English, Greek

Characters and Helvetica. Le Print is distributed in Australia by Optsoft, (02) 680 3930. □

'True-Blue (with shades of Toshiba)' Hepworth

WHAT COMES FIRST? Chickens or eggs, hardware or software? In the end, it isn't important, since both are essential, but while one computer can run a host of programs, having one piece of software and a host of computers is nonsense. My favourites are based on the one computer which will do all the things I need, and four software packages I use more than any others.

The choice of a computer is easy. I want a fast, powerful machine that will go wherever I go, and run wherever I am. That means a laptop, with a screen better than the average LCD, an internal hard disk, a fast processor and heaps of memory.

Chickens . . .

The Toshiba T3100 fits that specification perfectly, with a 80286 processor, an 8 MHz clock, an internal hard disk, over 2 Mbytes of RAM and a superb plasma screen. It is the perfect tool, provided a power point is in reach. It can be balanced on a knee or propped on a desk, and is generally unobtrusive until needed.

Now for the brains of the operation. The four software packages I find I use more than any other are Microsoft Word 3, PC-File III, Norton Utilities and Xtree. That's right — one commercial word processor, one user-supported database, and two indispensable utilities.

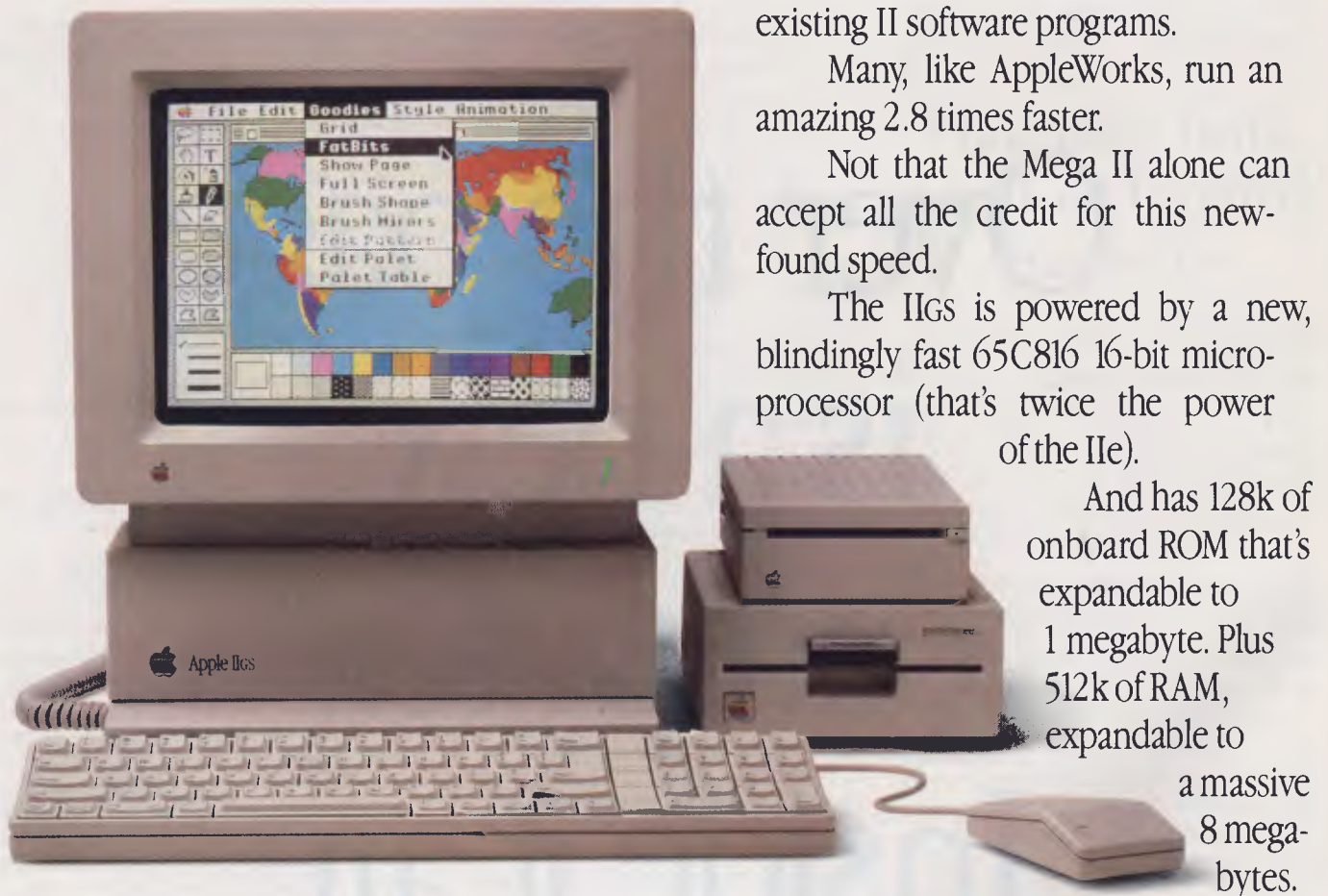
. . . Eggs

Xtree is one of the most useful utility programs ever released, allowing inspection of the tree structure of a disk with a visual display, and enabling you to alter file attributes, copy, move, rename and delete files. Creating, deleting and renaming sub-directories is a snap. Xtree is an absolute necessity for any hard disk user.

The Norton Utilities were one of the first to offer a way of un-erasing a file. This alone is a good enough reason to make sure a copy is right next to every machine. In addition, the ability to recover text from disks, to patch any file in ASCII or hex, to

The new Apple IIe.
Over the page
is a new
computer.
Inside it are
two more.

The new Apple IIgs.



existing II software programs.

Many, like AppleWorks, run an amazing 2.8 times faster.

Not that the Mega II alone can accept all the credit for this new-found speed.

The IIgs is powered by a new, blindingly fast 65C816 16-bit micro-processor (that's twice the power of the IIe).

And has 128k of onboard ROM that's expandable to 1 megabyte. Plus 512k of RAM, expandable to a massive 8 megabytes.

The new Apple IIgs features among other things, a built-in Apple IIe and IIc.

Both of these computers, or rather, their functions, have been built into the Mega II chip you see here (and that's its actual size, of course).

Two years in the making, you'll find the revolutionary Apple Mega II microchip alongside many other new custom chips on the IIgs motherboard.



We put it there for one simple reason.

Compatibility.

The IIgs runs virtually all of the 10,000

Which means you can run the most advanced software without running out of memory.

The IIgs was partly named after its graphics, and no wonder.

The IIgs can create graphics as clear and sharp as the photographs you see in this magazine.

But with one major difference.

The range of colours.

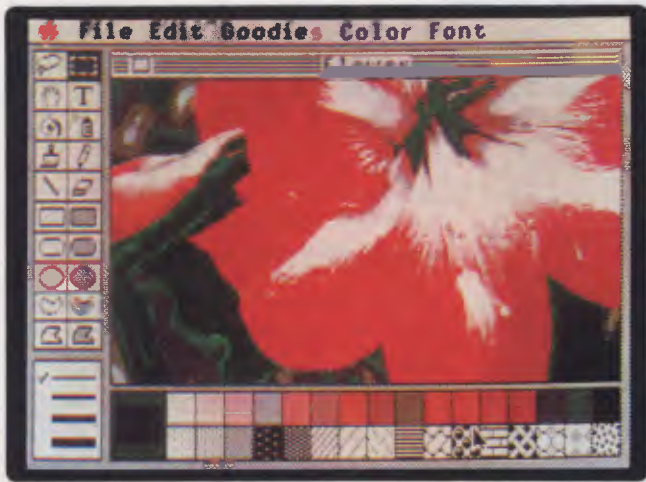
The IIgs has 4,096 in all. From delicate violet to electric red.

Any 256 can be used at a time in either of two graphic modes: 640 x 200 dots or 320 x 200 dots.

But you haven't heard anything yet. And we mean that literally.

The IIGs is so human, it even speaks.

The secret is a 32 channel Ensoniq sound chip, the kind you find in \$40,000



sound synthesizers (who says Apples aren't value for money?).

It allows you to compose for and play up to 15 instruments at a time.

(Now you know where the other half of its name comes from.)

Naturally, with such high-fidelity sound, it makes sense to add the optional Bose RoomMate hi-fi speakers.

It also made sense to redesign the IIG keyboard to give you maximum freedom.

This one is detached, so you can move it all over your desk.

Or hold it in your lap.

And to make number crunching easier, there's a numeric keypad built in.

The Mouse, now standard, can be attached to either side of the keyboard.

(We didn't want to make left-handers feel left out.)

Also standard on the IIGs is MouseDesk. The software program that gives the IIGs its Macintosh-like interface.

So now, transferring ideas into action is as easy as clicking a button.

And while the IIGs is easy to use, it's just as easy to expand.

There are eight expansion ports at the back of the machine where you can plug in peripherals.

Anything from disk drives to modems, joysticks to printers.

You can share a LaserWriter with up to 30 other computers, thanks to AppleTalk, built into every IIGs.

Not only can you plug in a cord, you can plug in a card.

Take off the top of the IIGs and you'll find eight expansion slots where once again



it's easy to make the IIGs smarter, faster or more powerful.

As improvements become available, you'll also be able to plug them in. So your IIGs will never become obsolete.

The new Apple IIGs.

It's even greater than the two computers inside it.



DUAL SPEED
NOW AVAILABLE!!

MADE IN U.S.A.
12 MONTH WARRANTY

KAYPRO introduces NON-OBSOLESCENCE

NEXT YEAR'S TECHNOLOGY?

That's easy. Replace the existing IBM PC/XT board with an IBM PC AT-compatible board, available now; IBM 32-bit standard, available soon; or whatever the future holds.

MEMORY-HUNGRY SOFTWARE?

Simply exchange the existing multi-function board 768 K standard for any configuration of memory, I/O, and controller boards

HIGH-RESOLUTION GRAPHICS?

KAYPRO's standard multivideo board features perfect monochrome clarity plus high-resolution color (IBM CGA). But, if it's IBM EGA that you want? - simply snap in a board.

FURTHER SYSTEM EXPANSION?

But of course! The KAYPRO PC is ready for anything. With six available slots, add what you need - networking, modems, more memory - the sky's the limit.

PLENTY OF STANDARD FEATURES?

DUAL SPEED:

Go from 4.77 8MHz with just a flick of a switch

POWER SUPPLY:

A generous 132 watts of power for even the most demanding hard drive.

FLOPPY DISK DRIVES:

Dual IBM-compatible floppy disk drives standard or slide in the drive of your choice.

HARD DRIVE EXPANSION:

Space provided for easy addition of internal hard drives.

BUNDLED SOFTWARE:

A full selection of business software for today and tomorrow.

KEYBOARD:

Detachable, IBM PC AT-style keyboard with security keylock.



Kaypro's new "Snap-In" technology lets you exchange or update all vital system components in seconds.

Computer technology changes with lightning speed. In the time it takes to read this, there will be dozens of new products on the market that make their predecessors obsolete. With that in mind, we'd like to give you a bit of good news. The fully IBM PC/XT compatible KAYPRO PC has been designed to eliminate computer obsolescence. That means it's a snap to update all vital system components - right down to the system's microprocessor.

And, if it's topnotch features you want, look no further. The KAYPRO PC delivers: IBM PC AT-style key-board, two disk drives, dual speed board, built-in color capability, and 768K of standard RAM. The culmination of Kaypro's 33 years of electronics engineering innovation, the American-made KAYPRO PC just may be the last computer you'll ever need.

PRICE: \$2495 **
\$3295 ** (20 MEG)

**20 MEG DOES NOT INCLUDE
A COLOUR BOARD **Suggested Retail**

(02) 542 3866

TELEX: AAT76269

For more information or
the location of your
nearest dealer call ...

KAYPRO

CORPORATION

Innovators of Electronic Products for Over 33 Years

**Suggested Retail Price Trademarks: IBM, International Business Machines

Favorite Things



sort directories, change screen colours and test system processor speed (the SY-SINFO program so widely used as a benchmark) are sheer magic. The Utilities even offer a little program to print out source code files with a left margin and pagination.

How long do you want to spend setting up a personal or business database before starting to use it? A year? A week? A day? How does 10 minutes sound? PC-File III can help you achieve this feat. A piece of what is known as user-supported software, it is available through user groups for a nominal sum, and satisfied users are asked to send a donation to the author.

Using PC-File III is really simple. Define a database with up to 42 fields, then define a report format. Subtotals and totals on numeric fields are supported, and the database size is limited only by the size of the disk. Data security is good, as PC-File III writes all additional or amended data to disk immediately.

I have intentionally left the best for last. Microsoft Word Version 3 has been my salvation over the past four months, making the writing of a 400-page manual, and typesetting it on a laser printer, possible in a minimum amount of time.

And an Omelette

Word processors tend to be either easy to learn and limited in function, or very powerful and hard to learn. Microsoft Word 3 bridges the gap. It is one of the most powerful word processors available, but is also easy to learn. A beginner can just scratch the surface of the list of features and get on with the job of creating documents — no difficulty there. Each new skill can then be added to your repertoire, one at a time, until all are mastered; the user interface is always consistent.

The features I really like most have to do with printer control. Word comes with drivers for a host of dot matrix, daisywheel and laser printers. The typefaces and type sizes for each printer are known to Word via that driver, and the user can choose fonts for the selected printer.

If you change the selected printer (a task needing only a few keystrokes), Word can determine which fonts on the new printer are closest to the fonts for the old printer, and adjust output to screen and paper accordingly. Unless some really fancy page layout work is required, say, with columns wrapped around graphics, Microsoft Word would be all many in-house-publishing operations require.

Word's inbuilt outline processor, style sheets, side-by-side paragraphs, automatic indexes and tables of contents, multi-line headers and footers and side-by-side paragraphs are indispensable.

There they are: four software packages I use every day, and the computer I would love to own ... maybe next year. □

Installed For IBM PC or Compatible (Quick Display)

Path: \

FILE ^Attributes ^Copy ^Delete Filespec Log disk ^Move ^Print
 COMMANDS ^Rename ^Tag ^Untag View ^Execute
 ←↑↓ scroll RETURN expand display ALT menu F1 quit F2 help F3 cancel

Les 'I've-Got-My- Priorities-Right' Bell

IN RECENT YEARS, there has been a boom in the popularity of spreadsheet programs — especially the ubiquitous

Lotus 1-2-3. Accountants, in particular, have been quick to see how many business problems can be translated to spreadsheet solutions, and this has spread to the adoption of spreadsheets for many other business-modelling and analysis tasks.

Not so with the database. While row-and-column analysis is familiar to most business people, the idea of a relational spreadsheet is strange and awkward, so these products have not gained in popu-▷

Our software makes your software smarter.



SMARTKEY

SmartKey does one thing. It lets you take any long, boring, repetitive or difficult-to-remember set of keystrokes and assign them to a single key. Sophisticated programs like Symphony give you a "macro" facility. SmartKey gives you macros for all your software in a single easy-to-use package. Any word, any line, any paragraph — even a whole page of "boilerplate" can be allocated to a single key and permanently saved. The uses of SmartKey are limited only by the imagination.

Available for IBM and compatibles (SmartKey 5.1), MS-DOS and CP/M-86 (SmartKey II Plus), CP/M-80 (SmartKey II) **Price: \$81***.



PC-ALIEN

An easy to use program that lets you read, write, and format disks from different CP/M and MSDOS machines! Speak to more than 220 other computers

If the disk format you need to access is not included in the current menus in PC-Alien, just send us your formatted CP/M or MSDOS diskette containing more than 50% readable ASCII text and we will try to add that format to PC-Alien's comprehensive list.

With the appropriate hardware, PC-Alien will allow you to read 3.5 inch, 80 track and 8 inch formats in CP/M-80, 86 and MSDOS. Available for IBM and compatibles. **Price: \$104***.



SMARTSTUFF

A collection of "pop up" desk tools which you can tailor to your needs. A full featured resident screen editor/ notepad. A programmable calculator. A sophisticated financial calculator. A calendar alarm clock. A telephone dialer. A DOS menu which lets you use common DOS commands. Also includes a program which lets you interrupt an application, run any other program and then return to the application just where you left off.

Available for IBM and compatibles. **Price: \$104***.



SPATH

A terrific hard disk space-saver which eliminates the need for multiple copies of overlay and other program files on disk. Run any program that uses overlays, help, or other auxiliary files from any directory, sub-directory or disk drive. Group documents or data files into separate directories and subdirectories without keeping copies of your software on each one. SPATH is easy to use and once installed it may be autoloaded and forgotten.

Available for IBM and compatibles, other MS-DOS **Price: \$33***.



PC-EIGHTY

Don't throw away your old favourite CP/M-80 software! Now you can run it at full speed on your IBM-PC or compatible. By simply exchanging the 8088 CPU chip in your machine with the latest state-of-the-art NEC V20 chip you retain 100% compatibility with other hardware and software.

The V-20 also runs 8080 (not Z-80) code at full speed. With our PC-Eighty software, you can run your copy of CP/M version 2.2 as a task under DOS. With hard disk access, a half megabyte RAM disk and simultaneous use of DOS resident programs like SmartKey.

Available for IBM and compatibles. **Price: \$140***.

Software

Dealer inquiries welcome

*Allow \$5.00 additional postage charges



AUSTRALIAN SYSTEMS SOFTWARE

FOR FURTHER INFORMATION:

Please send this coupon to
FBN Software
16 Coles Place
TORRENS ACT 2607
or call (062) 86 1 102

NAME _____

ADDRESS _____

P/CODE _____

Favorite Things

larity to the same extent. The fact remains, however, that in business there is more effort devoted to recording and processing data than there is to its analysis, and this is the kind of work for which the database is designed.

dBase III Plus breaks new ground in being both easy to use and powerful. When invoked in the ASSIST mode, the program is driven by pull-down menu blinds and an interactive user interface, which is intuitively obvious to most first-time users. Quite complex data-management tasks can be accomplished easily, with the program guiding a user through the steps.

Once users becomes more advanced, the new features of dBase III Plus come into play in assisting them with more complex tasks. The construction of multi-file relational spreadsheets, for example, is eased considerably by the new CATALOG and VIEW facilities. The SET VIEW command, in particular, makes it easy to edit and browse through relational databases without the requirement for programming.

In summary, dBase III Plus provides ease of use for the neophyte user, while still offering enough power to reassure buyers they won't have to throw the program away because they have outgrown it.

More Perfect 4.2

As I mentioned in an earlier review, I'm a heavy user of Wordstar — always have been, and it looks like I always will be. However, if the only machine I used was a PC, I'd probably dump Wordstar and switch to Word Perfect.

WP is an excellent word processor for corporate use. First of all, it's loaded with features, making it suitable for a wide variety of users. However, the features do not make it complex or difficult to use.

Some new products are further enhancing the capabilities of Word Perfect. The latest version, 4.2, includes an on-line tutorial, document summary information *a la* Wang word processing, a Table of Authorities feature (for legal users) and a number of other smaller additions from the Word Perfect users' wish list.

A new program called The Library adds new facilities to the program. The first part of this is a menu-driven front-end program, called The Shuttle, which provides a friendly face for inexperienced DOS users. The second part is a collection of utilities, including a macro editor, a program editor, alarm clock and a simple notebook



database facility.

Also new is a spreadsheet called MathPlan, which integrates with Word Perfect. Under the Shuttle, users can switch instantly between the two programs, which share a common command structure and function key usage.

All this adds up to an increasingly powerful product which is entirely appropriate for corporate purchase. Absolutely outstanding. Pity it won't run on our Compro system!

C New Standards

The importance of the C programming language is axiomatic for most PC programmers. A good C compiler makes it easy to generate systems software, utilities and even applications software of high quality at moderate cost. Assembler can give higher performance, but at much higher cost. COBOL, FORTRAN and BASIC can (sometimes) be cheaper and faster to program, but not as efficient or versatile.

Microsoft C sets new standards for quality of generated code, for quality of documentation, for portability, for conformance to the proposed ANSI standard, and for providing a programming environment, rather than just a compiler.

The Microsoft C V4.0 compiler generates good, fast code reliably. But if you should have bugs, then the Codeview debugger which comes as part of the package is an enormous help in tracking them down. This mouse-driven debugger allows single-stepping through source code, with simultaneous display of variables, multiple breakpoints, disassembly with interlaced source, display of processor registers, and is incredibly easy to use.

Add to this a selection of utilities for modifying .EXE files and a MAKE utility and you have a very comprehensive package for large-project development.

Irrelevant

As a frequent traveller with an addiction to computers, I used to suffer withdrawal symptoms when away from the office and unable to update spreadsheets, databases and other files. For a long time I hunted for a solution to this problem.

For a long time, I used a Kaypro II, a sturdy metal clunker of an 8-bit machine. It stood up well to being thrown into the back of Fokker Friendships, car boots and all kinds of other places, and served well as a general office machine as well. But as we made the transition to MS-DOS, it

Favorite Things

gradually became, well, *irrelevant*.

I looked at a variety of portable and transportable machines: the HP-110, the HP Integral, Compaq's various machines, the Data General DG One, the Toshiba 1100. None offered everything I needed: IBM compatibility, high-resolution high-contrast screen, and 10 Mbyte (at least) mass storage.

Cute, Powerful and it Works

Finally, however, I have found a machine which meets my needs: the Toshiba T3100. This machine is a clone of the IBM PC AT, in a lap-top clam-shell format. It's heavier than your typical lap-top, but that's not a problem. The machine is not intended for lap-top use, as it requires a mains power supply, but that's not a problem. This is a powerful machine designed for those who travel from office to office to hotel room — wherever mains power is available.

Unlike liquid-crystal displays, which are often difficult to read under poor lighting conditions, the T3100's red plasma discharge display is readable under virtually all conditions. It boasts 640 by 400 resolution, and when operating in text mode, has a particularly pleasing character set.

The T3100 has an 80286 processor operating at 8 MHz, with 640 Kbytes of memory (not sure at this stage how many wait states). A further 2 Mbytes of memory can be added to the machine, making it ideal for large spreadsheet work or databases using large VDISKS.

The major benefit of the 3100 is its built-in 10 Mbyte hard disk. Mine is fully loaded (and then some — it's currently covered with C compilers). A hard disk is more than a convenience feature these days — it's indispensable.

The keyboard of the T3100 has 81 keys, and is a bit restricted compared to the new XT2 and AT2 keyboards. The major lack is of a separate numeric pad — especially the plus and minus keys, which are used by Framework, for example (not to mention Flight Simulator). However, various means exist for accessing the missing keycodes, and we can usually work around them.

Other neat features include a built-in serial port, parallel port (doubles as external floppy disk controller), colour graphics adapter, and an expansion port which will (real soon now) accept a multi-standard modem.

The whole machine is unbelievably



cute, unbelievably powerful and works incredibly well.

I've had my machine for four weeks now, during which time it has racked up over 20,000 kilometres. I've used it in London, Amsterdam, Stockholm and Sydney, and everywhere I've gone it has attracted lots of interest. I know of a number of large organisations, including one large UK insurance company (it's buying *thousands* for its agents), which are buying them.

Nobody, but *nobody*, fails to be impressed by this machine.

Management Technology Education Supporting PCs Seminar

(Those readers who disapprove of blatant self-promotion should stop reading now. We disapprove too, but in this case Les is making a valid point — ed.)

A favourite purchase of several thousand companies in Australia and around the world is Management Technology Education's three-day seminar on 'Supporting Personal Computers'. The reason is simple: personal computers have virtually run amok in many large corporations, and are often outside the control of the data-processing department.

As a result, many companies' experience with personal computers has not been 100 per cent favourable; in fact, in the majority of companies, PC usage is both ineffective and inefficient. Senior DP personnel were slow to realise just how much support end users would require, and just how complex PCs are.

The Supporting Personal Computers seminar addresses the key issues which

must be resolved to effectively implement and support personal computers throughout an organisation. Day one covers management issues, such as implementation of a personal computer policy, equipment selection guidelines, establishment of a PC Support Group and various issues encountered by PC support staff, such as getting support from suppliers.

On following days we progress to discuss software selection techniques, the major software packages, operating systems, software development, hardware selection, hardware trends, hardware upgrades, asynchronous and synchronous communications, networks, and miscellaneous support techniques, such as installing PCs and DOS, writing batch files, recovering deleted files and standard maintenance procedures.

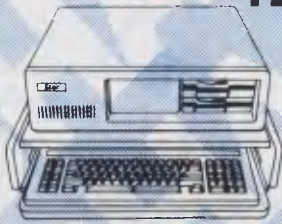
Delegates receive almost 600 pages of course notes — a kind of 'enquire within on personal computing' — which they can use for reference after the seminar, together with a floppy disk of useful software.

A good time is had by all, since discussion ranges widely, both during the formal sessions and during coffee and lunch breaks. Case studies really get debate going, and provide delegates with an opportunity to present their views and experiences.

To date, several thousand companies around the world have sent staff on this course, making it a favourite corporate purchase. And of course, this pleases me no end, because the course designer and presenter is, of course, yours truly. □

UNBEATABLE!

STAR PC/XT TURBO IBM® COMPATIBLE \$1249



4.77 to 8.77 MHz (Hardware switchable), 8087 socket, 8 extension slots. 640K RAM, serial port, parallel port, games port, clock/calendar/battery B/U, colorgraphics card, floppy drive card, 2 x 360K drives, 135W power supply. (Desk not incl.)
6 MONTHS GUARANTEE

COMPUSHIELD NATIONAL
SERVICE CONTRACT
AVAILABLE ON REQUEST

BONUS OFFER!

FREE WITH EVERY SYSTEM

PC Blue public domain Catalogue disk buyer can THEN SELECT 10 DISKS FREE.

PC747



IBM® COMPATIBLE \$1799

512K RAM on Mother Board, 8 extension slots, 1 parallel port, 2 serial ports, 8087 co-processor socket, 1 TTL monochrome output. **SAKATA SA 2500 MONITOR HI RES TTL GREEN SCREEN**, Video Bandwidth 25 MHz, 80 characters x 25 lines. **SUPER 5 EPI100 PRINTER** 100cps — 80 column, Tractor/Friction Feed, Bi-Direct, Dot Bit Addressable.
6 MONTHS UNCONDITIONAL WARRANTY

SOFTWARE SPECIALS

Microsoft Access	\$327.75
Microsoft Chart	\$396.75
Microsoft Flight	\$79.35
Microsoft Multiplan	\$272.55
Microsoft Multiplan + Chart	\$603.75
Microsoft Project	\$534.75
Microsoft Quick Basic Computer	\$134.55
Microsoft Windows	\$155.25
Microsoft Word	\$583.05
Microsoft Mouse	\$258.75
Microsoft Windows + Mouse	\$376.05
Microsoft Word + Mouse	\$755.55
Microsoft Basic Compiler	\$548.55
Microsoft Basic Interpreter	\$479.55

SUPER 5 PRINTERS

EP 1090 PRINTER	\$395
EP 1000 PRINTER	\$495
EP 1201 PRINTER	\$519
EP 1802 PRINTER	\$699
EP 1505 PRINTER	\$895
EP 1805 PRINTER	\$1495

ALL PRINTERS SOLD INCLUDE 1 BOX A4 PAPER

PC ADD ON CARDS

640K STD Mother Board	\$426
640K Turbo Mother Board	\$589
360K Floppy Card	\$69
1.2 Meg Floppy Card	\$199
MULTI I/O CARD	\$199
Colorgraphics Card	\$149
2 Meg Above RAM Card	\$499
576 RAM Card (Short BD)	\$59
RS232 Card	\$89
Printer Card	\$47
COMS 2 KIT (Upgrade Kit)	\$49

RIBBONS - TWO FOR THE PRICE OF ONE

DIABLO RIBBONS	\$14.95
LX 80	\$15.95
LQ 1500	\$19.95
MX 100	\$17.95
MX 80	\$19.95
CPA 80	\$14.95

COMMODORE PRINTER SPECIAL! \$380

CPA80C
While stocks last

FLOPPY DISKS DS/DD CERTIFIED

SPECIAL PRICE PER BOX OF 10

1 box of 10	\$17.00
2-5 boxes	\$16.50
5-10 boxes	\$16.00
10 boxes +	\$15.50

MICRO SHACK

PC BLUE
PUBLIC DOMAIN SOFTWARE

\$6 DISK

plus \$3 postage and handling

catalogue disk available \$6

COMING SOON!

COMMODORE,
ATARI ST,
AMIGA,
MAC

PRIORITY ORDER HOTLINE
008 88 8279 (ORDERS ONLY) TOLL FREE
OTHER INQUIRES TO (08) 873 2252

Or Write to
MICROSHACK FREEPOST 11
P.O. BOX 255
MITCHAM VIC 3132
All purchases subject to postage (or freight) and handling charges — minimum \$5
Prices subject to change without notice.

MICRO SHACK

MICROSHACK PTY. LTD.

MELBOURNE
483A Whitehorse Rd.,
Mitcham, Victoria
(03) 873 2252

ADELAIDE
270 Morphett St.,
Adelaide, S. Aust.
(08) 211 8808

SYDNEY
OPENING
SOON!

PHONE OUR HOTLINE
008 88 8279 TOLL FREE
FOR INSTANT SERVICE





Performance is really the name of the game in the business micro market these days. While IBM's AT may have started it all, it has quickly been eclipsed by the imitATors. And, says Matt Whelan, you could be forgiven for thinking you needed a pilot's licence for at least two of them . . . two which, naturally, made it onto his list of the top ATs of 1986.

IF YOU THINK I'm power-hungry, you are right — but it may surprise you to know that two of my selections for the pick of the ATalikes of 1986 don't even make it to the top ten in the performance stakes.

I'm a little shell-shocked after a year of comparing the fastest micros around; picking the leading five was no easy task. Despite my bias, I knew the choice had to be based not only on performance, but also on design features and value for money.

That's why the Texas Instruments Businesspro was one of the first machines on the list — it ranks a seeming lowly fourteenth on our performance chart, but is such a clever, integrated and well-engineered design it could not be overlooked.

The Televideo Telecat 286, though ranked eleventh on the fleet-sheet, was the next to get the nod — simply for its sound engineering and value for money. And that was before we discovered Data Peripherals has a big shipment of the Telecat available 'on special' at a stunning less-than-\$5000.

Also getting the nod on the basis of bang-for-the-buck is the Osborne SP, tested only last month. It's our fifth-fastest performer overall, yet can be had for \$6000 complete and ready-to-run, including a 44 Mbyte *fast* hard disk.

The Osborne ousted the locally assembled Video Technology machine, my favourite of the December issue contenders, purely on the basis of price.

My final selections, it may not surprise you to know, were two of the hottest machines we've seen.

Speed Killers

The world's fastest PC? We asked ourselves that question after testing ITT's astonishing Xtra XL, which blitzed all the performance stars of our previous AT tests.

There was little doubt, according to our sizzled stopwatches. So we photographed it for the cover of that issue (September 1986), and asked our readers the same question. We should have known better in this fast-changing world of superchip PCs

— for no sooner had the ITT wheelspun its way across our desks than the jet-propelled, *Australian-built* Earth Computer Systems Eclipse blasted its way to the top of our performance charts.

Was it over? No! The ECS could only hold its place for a few weeks before it too was blitzed — by yet another ECS release, powered by a 12.5 MHz version of the 80286 processor.

With this sort of rewrite of the performance rules, you might expect the ITT to drop from sight — but it's still the top overall performer in the category. As a multi-user machine it outclasses its opposition with mini-killing performance.

On our single-user DOS benchmarks, however, it has to settle for a close third to the two hotshot locals.

Performance Redefined

Our AT tests have always been about performance, but the latest contenders seem to have redefined the word. However, all the machines tested in the past year have been quick enough to make the PC user drool. Here's how they shaped up, test by test:

January: Our first comparison showed just how much opposition IBM would face during the year — It was blitzed by the NCR PC8, the TI in its 'Turbo' mode, and the Compaq 286.

All three were close. Despite the NCR's performance advantage, the amazing TI was my money-is-no-object choice.

May: The Archives Micro Five emerged a clear winner after the May issue second-round, ahead of a respectably quick but outclassed group which included Presi-



dent's AT, Hewlett-Packard's Vectra, and Sperry's PC/IT.

The Archives machine had enough sting to stay with the leaders right up until the end of the year — even though it gave a less-than-its-best performance because of a cluttered hard disk.

September: The adrenalin was really flowing in our stopwatch hand in September as we uncovered the great speed challenge — ITT's machine running away from the pack only to be zapped by the ECS.

These two stole the limelight from the otherwise deserving, and always delightful, Hytec Lingo AT and Telecat 286.

November: The revamped ECS machine (actually an XT clone rather than an AT-like!) stormed to an unassailable lead, leaving the fast-and-solid DSE Multitech 900 and the NEC APC IV in its wake. Bringing up a still-respectable rear were the Sanyo MBC 990 and Ferranti PC2860-AT.

December: Video Technology's AT snuck past the ITT to take over second place overall, beating Keller Automation's Micro 10, the Osborne SP, and Sperry's new baby Micro/IT.

These machines took over four of the top six performance places, at a price that re-defined the concept of value-for-money at the top end of the market.

Two Dozen Plus, Plus

We've said on occasions there were too many ATalikes hitting the market for us to keep up — nothing's changed. Our review tally has passed 24 and we're still at least two behind what's actually available in showrooms (which is always quite different from the number 'released').

However, of the ones we've benchmarked so far, these are our current carefully considered selections:

ECS Eclipse: This machine isn't even an AT clone — it's designed as a superfast XT (the idea is to ensure greater compatibility with the range of standard PC software). Its 12.5 MHz, no-wait-state 80286 processor makes its resemblance to an XT purely imaginary, however.

The Victorian-produced ECS machine has been designed as the 'ideal vehicle' for engineering and Computer-Aided Design (CAD) applications, or single-user situations where speed is vital.

If it's not fast enough for you, fear not — the company is already working on yet another 'higher-performance' version!

The Australian company has what is clearly the fastest micro available here, apart from the new-generation Compaq 386 (and it even beats that on three of our tests!). It makes *all* the ATs we've tested look positively pedestrian.

The first ECS ran rings around its imported opposition, with only the high-powered, high-priced ITT Xtra XL coming even close to its figures. The new machine rewrites personal computer performance standards, and moves clear of the pack into a class of its own.

The ECS is purpose-built for CAD applications, running the high-resolution Enhanced Graphics Adapter, a numeric coprocessor, and a fast 40 Mbyte hard disk. Since our first test of the ECS, we've had a few reports in from owners who seem very happy with their choice (and very proud of its performance!).

ITT Xtra XL: STC is justifiably proud of

this machine, which is one of the real quality products in the marketplace. It looks, and feels, solid, well-thought-out and well-engineered.

Like the Archives Micro Five, it is basically a purpose-built multi-user machine. Its design goes well beyond the AT, employing most of the available techniques (high-speed memory, disk-caching, high-speed disk access and so on) to extract superior performance in the multi-user situation.

And it goes even further with the provision of intelligent input/output controllers which allow a 16-user Xenix configuration with, according to STC, no system degradation at all. The eight-port cards carry their own 80186 processor, which takes the I/O burden off the main processor, freeing it for the serious work.

Televideo Telecat 286: The Televideo features one of the most individual designs of the group. The most obvious difference is the size of the system unit, which is not only far more elegant than the 'standard AT box', but also fits into a footprint around 60 per cent the size.

The company had to play some tricks to achieve the size reduction. The biggest problem with downsizing one of these machines is usually the restricted access to the motherboard — Televideo has handled that one neatly by allowing it to slide out from underneath the disk drives. The hard disk is mounted vertically at the side of the case, which means the space for a second floppy or hard disk drive, or tape back-up unit, is still available under the single 1.2 Mbyte floppy.

The Telecat also lost some expansion slots in the trimming exercise: it has five, compared to IBM's eight, but has serial and parallel ports built into the motherboard, and can take up to a megabyte of RAM without add-on cards.

Osborne SP: There was little about our test Osborne to make it stand out from the crowd — until we fired it up! The SP stands for Special Performance, and it does.

In fact, the machine we tested was a prototype mounted in a very standard, boring AT-clone case — the production model will feature a much more stylish tower-mount casing.

As we said last month, it matters little how the Osborne looks — its price/performance balance is outstanding.

TI Businesspro: The 6 MHz Texas Instruments machine is quite different to

MULTISYNC HIGH RESOLUTION COLOUR MONITOR

MULTISYNC

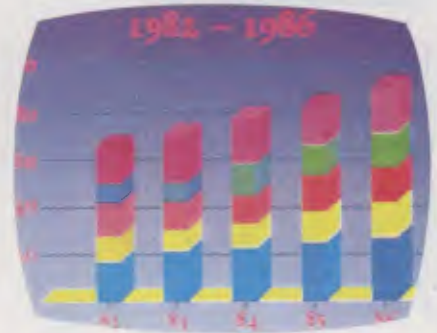
The Intelligent Monitor



Compatibility with the IBM Professional Graphics Adapter Board



Compatibility with the IBM Enhanced Graphics Adapter Board



Compatibility with the IBM Colour Graphics Adapter

FEATURES OF MULTISYNC

- MultiSync automatically scans all frequencies between 15.5 kHz and 35 kHz.
- MultiSync is compatible with the IBM PC, PC/XT, PC/AT and look-alikes.
- MultiSync is compatible with the IBM Professional Graphics Adapter, the IBM Enhanced Graphics Adapter, the IBM Colour Graphics Adapter and other IBM compatible graphics adapters.
- MultiSync's wide compatibility makes it possible to upgrade boards or software without purchasing a new monitor.
- MultiSync has a maximum horizontal resolution of 800 dots and a maximum vertical resolution of 560 lines for superior clarity of display.
- MultiSync offers both TTL and ANALOG signal inputs, and in the ANALOG mode can display an unlimited palette of colours depending on the graphics board and software being used.
- MultiSync features a TEXT SWITCH with a choice of seven colours (red, blue, green, cyan, yellow, white and magenta) displaying word processing, spread sheets, databases or other software in crisp alphanumeric text on a dark-bulb black background.
- MultiSync has a 35 cm (14") diagonal tube and a large, 250 x 180mm (W x H) viewing area.

SPECIFICATIONS

Picture Tube	370 HYB 22 dark glass, direct etched
Size	35 cm (14"), 90° deflection
Dot Pitch	0.31mm
Input: Video	RGB (Intensity)
Level	TTL or analog
Sync.	TTL positive/negative, separate or composite analog composite or Sync. on green
Terminal	D-Sub 9 pin
Synchronisation:	
Horizontal	15.5 kHz - 35 kHz
Selection	Automatic
Vertical	50Hz - 60Hz
Resolution:	
Horizontal	800 dots (max.)
Vertical	560 lines (max.)
Bandwidth	30MHz (3 dB)
Display Colours	8/16/64 in TTL mode Multicolour in analog mode
Active Display Area	250 x 180mm
Misconvergence	Less than 0.6mm
Power Supply	240V, 50Hz
Power Consumption	78 W max.
Dimensions	368 (W) x 227.6 (H) x 382 (D)mm
Weight	15.2 kg

HYPEC ELECTRONICS PTY LTD

21 Ryedale Rd, West Ryde, Sydney NSW Australia 2114.

Tel: (02) 808 3666. Fax: 808 3596. Cable: LAMRON

SYDNEY. Telex: AA71551 LAMRON.

TELEPHONE ORDER HOTLINE: (02) 808 3666.

Bank cheque, money order, Visa,
Bankcard & MasterCard accepted.

HYPEC
ELECTRONICS

NEC
MULTISYNC

the usual AT design, although it follows the same basic theme.

First, it is obviously designed to sit upright beside the desk rather than on it as a monitor support — the way all these too-big 'desktops' should be used. A bolt-on stand is provided as standard on the TI, and the drives are mounted so they'll be horizontal when the machine is stood in a tower configuration on the floor.

The second obvious difference is the rear panel — while most machines slavishly follow IBM's standard of providing eight expansion slots, the TI has 14. This

external difference hints at major internal variations — the TI is a cleverly designed machine, and fits a whole lot more into the package than the others.

You don't even have to use the expansion slots when you add memory to the TI, as it has an extra board which slides in from the front of the machine, straight into a special connector on the motherboard; it can carry 3 Mbytes of RAM. Also, there's room for no less than six half-height drives, four at the usual right-hand (or top) end of the case, and two more on the left.

The TI monitor and keyboard carry on the design brilliance. The monitor has its own tilt/swivel stand, and carries a volume control for the speaker mounted in the system unit. In the front of the monitor base, at either side, are sockets for the keyboard and mouse connectors — thoughtfully interchangeable, so left-handers can mouse it up in comfort.

The keyboard has a tiled design — if you lift any of the tiles (using the tool supplied, which sits in a slot of its own underneath the keyboard) you find working key movements. You can move the key loca-

Against The StopwATch, Again

PERFORMANCE is what the AT is all about — and it's the one area in which most of its competitors seek to outgun it — so *that* formed the basis of all our comparisons. To ensure we had consistent, comparable results across the range of machines tested, we retained an identical set of benchmarks throughout the year's testing. For those who missed the original stories, here are the details of the performance tests used.

Lies, damn lies, statistics... and benchmarks. Benchmarks can be misleading, we know, but in the case of a direct comparison of such similar machines we consider any measured test a valid indicator. We didn't set out to create special benchmarks to test the ATs — we simply put together a collection of tests we've used before and added a few that happened to take our fancy at the time.

Our tests measured straight processor speed in only two cases (to give us an idea how the different versions of the 286 compared), and in the others measured overall performance in typical user situations. The tests were:

■ **BBBMark** — Boring, BASIC Benchmark isn't really what it stands for, but it will do. It's a straight do-almost-nothing loop in Microsoft BASIC which tests the processor's ability to run around in circles. It goes like this:

```
10 FOR I=1 TO 10000
20 A=A
30 NEXT I
```

■ **CBSieve** — a compiled CBASIC (Digital Research's CB86) version of old faithful, the Sieve of Eratosthenes.

You'll usually see the Sieve benchmark written in C, occasionally in MBASIC — we just happened to have a CB86 compiler for the ATs, and no C compiler at the time. It doesn't really matter for the sake of our tests, but you can't compare these Sieve times with those in other languages on other machines.

■ **Lotus** — a three-stage test using one of the most popular PC packages, Lotus 1-2-3. We timed the machines loading a 300-Kbyte-plus file, recalculating it, and saving it to disk again. The spreadsheet contents were meaningless, simple calculations duplicated in blocks until they filled the available memory of the 512 Kbyte AT.

■ **dBase** — another three-stager, used often by Les Bell to compare the overall speed of test machines. The results of this test can't be compared to our previous dBase benchmarks, however, as we used the new Version 2.43* and made the test five times as long. The first stage of this test measures computation speed, the second a combination of CPU power and disk I/O, and the third measures straight file handling and disk accessing.

■ **Doit** — Just something we needed to do for the other tests, so we made it a test on its own... our Doit batch file loaded three quarters of a megabyte of files onto the hard disk from the AT's 1.2 Mbyte high-speed floppy, from three subdirectories on the floppy to three newly created subdirectories on the hard disk. This gave us a measure of floppy-to-hard-disk transfer speed.

We measured each machine several times on each test, and drew up a chart

of the results. In the first comparison we rated each of them on the results, and drew up a performance grading chart. The rating system was simple — the fastest machine on that particular test got 100, and the others were given points that amounted to their time expressed as a percentage of the winner's. This system seemed less valid the second and third times around, when we wanted not only to compare the machines in the individual test session, but also rate all of the ATs tested against each other.

So from the second comparison we instituted a system of rating all the challengers against the 'standard', the IBM AT. We compared each machine's times against the AT and rated them as a percentage of the IBM. Thus a machine with similar performance to the AT would show up as 100 per cent, one with 20 per cent better performance would show up as 120 per cent, and so on.

On the first test we had the NCR machine for a short time only, and missed the Doit test on it. We decided to give it an 'estimate' for this test so future ratings charts (including this issue's one) can give a complete overall rating to the other machines. The estimate was based on its performance on the other tests, and took into account its strengths and weaknesses.

All the machines were set up as similarly as possible for the tests. Where possible their hard disks were formatted and loaded with exactly the same files, in the same order. We ran the tests in the same order on each as well. □

tions around to suit yourself! (Although at the time of testing, the software required to redefine the keyboard didn't yet exist).

Screening Ahead

In the earlier tests we noted manufacturers like Texas Instruments and Hewlett-Packard weren't content to be 'limited' by the IBM standard, electing instead to provide standard-equipment 'extras' like high-resolution video controllers.

Later groups of test machines showed this trend was accelerating — most now provide multi-mode or high-resolution video as standard. Of our top five, only the Osborne comes without an EGA-style high-resolution colour screen.

The ITT came with a dual-mode graphics card (colour graphics and monochrome text outputs ran through separate cables to the dual-mode monitor).

The ECS sported a Digicom Digis-1000 Enhanced Graphics/Printer adaptor, which

provides the three IBM modes — monochrome display, colour graphics and enhanced graphics adaptors — as well as the Hercules mono graphics mode.

The Televideo had just the sort of screen we would expect of a company which made its name selling quality terminals — a 14-inch high-resolution non-glare display with a high-resolution controller. It well and truly lived up to the company's reputation.

The TI is able to 'downgrade' to the IBM CGA standard but also runs a TI-PC compatible high-resolution mode that is very impressive.

Multi-Speedsters

Multi-mode processors are the order of the day as much as multi-mode video cards — all but one of our top machines came with switchable processor speeds.

The ITT allowed three-way switching, between 6 MHz (the IBM standard), 8 MHz

with one wait-state, and 8 MHz with no wait-states. Two speeds can be selected as 'standard' using the set-up program — a default speed (usually the fastest) and an alternate speed (usually the slow IBM-compatible speed). Once selected, these can be toggled at the keyboard.

ITT describes the ability to select 6 MHz as 'complete backward compatibility'.

The Televideo runs 8 MHz with one wait-state as its fastest speed, and allows a change to the IBM speed through a switch mounted at the rear of the machine — a less-convenient, but still useful, arrangement.

Because of its lack of switchable speeds, the only stand-out compatibility problem was with the ECS, which is just too fast for Softguard's Superlok copy protection scheme. We were unable to install dBase III Plus (the protected version 1.0; unprotected it works just fine — another solid argument against this copy-protec-

	BBBMARK	CBSIEVE	Load	Lotus Recalc	Save	Stage 1	dBase II			DOIT	Issue Tested
							Stage 2	Stage 3			
ECS 12.5 MHz	3.7	1.75	12.4	3.0	11.7	144	209	228	54.0	November 1986	
Video Technology	5.3	2.9	18.0	4.5	12.7	220	249	276	33.5	December 1986	
ITT Xtra XL	5.5	2.65	16.5	4.4	13.0	238	267	298	50.0	September 1986	
Micro 10	5.5	2.9	20.2	4.7	12.9	223	294	329	42.3	December 1986	
Osborne SP	5.3	2.9	22.5	4.4	12.4	222	297	334	60.5	December 1986	
Sperry Micro IT	5.6	2.7	23.6	4.6	12.3	221	336	367	65.2	December 1986	
MicroFive	5.6	2.89	22.0	4.9	12.9	294	258	353	66.2	May 1986	
DSE Multitech	5.5	2.93	22.8	4.5	24.4	224	322	359	64.4	November 1986	
NPC APC IV	6.9	3.68	22.5	5.5	13.0	280	331	372	42.7	November 1986	
Hypac Lingo AT	6.9	3.69	23.0	5.8	13.0	280	326	366	69.0	September 1986	
Televideo Telecat	6.9	3.70	22.2	5.8	13.5	281	366	403	55.0	September 1986	
NCR PC8	7.0	3.70	23.3	6.0	14.0	280	315	351	68.0*	January 1986	
Sanyo MBC 990	7.5	3.63	23.2	5.9	15.5	303	378	422	40.5	November 1986	
TI Turbo	7.3	3.64	23.4	6.0	14.4	307	391	435	46.0	January 1986	
Compaq 8 MHz	6.9	3.69	22.5	5.5	13.8	281	434	476	62.3	January 1986	
President AT	6.9	3.56	23.5	6.0	14.1	306	382	425	85.5	May 1986	
HIP Vectra	6.9	3.69	23.2	5.5	23.0	283	472	514	70.0	May 1986	
Sperry PC/IT	6.9	3.71	22.8	5.8	25.1	287	393	573	71.3	May 1986	
Ferranti PC2860-AT	7.0	3.71	23.5	6.0	24.2	284	458	501	67.0	November 1986	
IBM AT	9.1	4.89	23.8	7.7	23.3	378	408	458	57.0	January 1986	
Kaypro 286i	9.1	4.89	23.5	7.7	23.5	379	403	452	77.3	January 1986	

AT Best

tion stupidity).

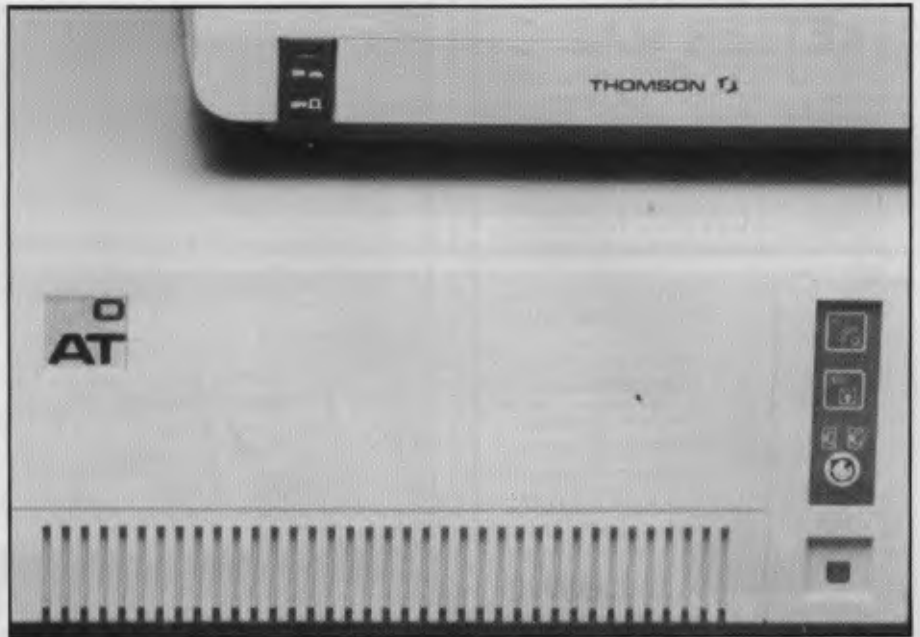
ECS has sent a machine to Softguard, which is looking at the problem. Meanwhile buyers who want the fastest machine in town also need a copy program like Unguard, because the only alternative is having ECS slow the machine down (which it will do if you're silly enough to ask...).

We still regard this as a flaw in the machine — switch-selectable speed would be the ideal solution.

A Few Observations

I won't go into a blow-by-blow description of our performance testing (you can see for yourselves in our performance charts, which cover the leading 21 machines), but will make a few observations on the behaviour of the top five.

The obvious bits first: the ECS and the ITT really are rocketships. However, there are very few applications where you'll no-



	BBMARK	CBSIEVE	Load	Lotus		dBase II			DOIT	% of IBM
				Recalc	Save	Stage 1	Stage 2	Stage 3		
ECS 12.5 MHz	245	279	191	256	199	262	195	200	105	215
Video Technology	171	168	132	171	183	171	163	165	170	167
ITT Xtra XL	165	184	144	175	179	158	152	153	114	159
Micro 10	165	168	117	163	180	169	138	139	134	153
Osborne SP	171	168	105	175	187	170	137	137	94	150
Sperry Micro IT	162	181	100	167	189	171	121	124	87	145
MicroFive	162	169	108	157	180	128	158	129	86	142
DSF Multitech	165	166	104	171	95	168	126	127	88	135
NE PC IV	131	132	105	140	179	135	123	123	133	134
Hyp & Lingo AT	131	132	103	132	179	135	125	125	82	128
Televideo Telecat	131	132	107	132	172	134	111	113	103	127
NCR PC8	130	132	102	128	166	135	129	130	83	126
Sanyo MIC 990	121	134	102	130	150	124	107	108	140	125
TI Turbo	124	134	101	128	161	123	104	105	123	123
Compaq 8 MHz	131	132	105	140	168	134	94	96	91	122
President AT	131	137	101	128	165	123	106	107	66	119
HP Vectra	131	132	102	140	101	133	86	89	81	111
Sperry PC/IT	131	131	104	132	92	131	103	79	79	110
Ferranti PC2860-AT	130	131	101	128	96	133	89	91	85	110
IBM AT	100	100	100	100	100	100	100	100	100	100
Kaypro 286i	100	100	101	100	99	99	101	101	73	97

Write a letter with just 5 key-strokes

Lewis LETTER MAGIC

Lewis LETTER MAGIC dramatically reduces your time and effort in producing letters, labels, reports, simple invoices, etc. Easy to master as it only includes those commands needed to write letters. More than just a word processor, LETTER MAGIC includes a powerful database. Lets you merge individual details into bulk mailings.

Ideal for sales, customer maintenance, clubs and any office that writes letters. \$454.00 incl. tax.



Dr Geoffrey Lewis
"LETTER MAGIC is my most innovative product. With LETTER MAGIC I have automated the production of letters."

Lewis CROSS-CHEQUE

Lewis CROSS-CHEQUE helps you keep better track of your accounts (and your business) by doing all your cashbook work for you. Lets you prepare a detailed report for your accountant.

Ideal for businesses not needing general ledger accounting, such as doctors, shops, farmers. Over 300 users already. \$318.00 incl. tax.

Lewis PAY-PACK

PAY-PACK lets you pay your staff using your own computer. Produces pay slips, group certificates, cash break-ups, reports, etc. Now being used by over 250 employers. \$786.00.

Demo Kits — Each comprises the manual and a disk allowing you to test all aspects on your own computer. Your payment can be credited to your purchase. Available for most MSDOS & CPM86.

Send coupon to:
Custom-Made Software Pty Ltd
P.O. Box 507, Randwick, NSW 2031
Tel: (02) 399 8566

	Letter Magic	Cross- Cheque	Pay- Pack
Send more info.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Send demo kit (cheque enclosed)	\$36 <input type="checkbox"/>	\$36 <input type="checkbox"/>	\$60 <input type="checkbox"/>
Send full system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Name:

Address:

Phone: Computer:

AT Best



tice the difference — right down to the TI, these machines are *f-a-s-t!*

The Telecat's excellent overall performance was all the more impressive when you consider it runs a relatively standard hard disk — in contrast, we could hear the telltale sound of (high-speed) voice-coil actuation on virtually all the top-line machines.

The Televideo result is an example of what a little careful tuning will do for standard components — when Televideo goes to a faster processor and voice-coil drives I want to watch its maiden flight!

See Your Bank Manager Today

You'll need to if you want to buy an ITT — the price of that engineering excellence and performance tuning isn't cheap. STC admits the XL price is a little 'heavy' for a single-user desktop machine, but has never considered that to be its market.

Instead, it sees the machine as a network master or, more often, as a high-performance Xenix multi-user machine to rival very powerful minis, and in that role it starts to look like a bargain.

Starting price for the Model I, with 640 Kbytes of memory and a 40 Mbyte hard disk, is around \$14,000 — the top-of-the-line Model IV, with 1.64 Mbytes memory, a 72 Mbyte hard disk, 60 Mbyte tape drive and intelligent I/O controller for eight users runs out at close to thirty big ones.

The ECS machine is spectacular in the power-for-the-dollar stakes, retailing at around \$10,000 as tested. (ECS can be contacted on (03) 439-4900. The Sydney

dealer, who supplied our test machine, is Magic Computers of Harris Street, Ultimo.)

The Osborne and Televideo machines are a relative steal considering their performance. The base version of the Osborne AT sells for around \$5000, including monitor and a 20 Mbyte disk drive. The voice-coil 44 Mbyte drive that did so much for its speed on test brings the price up to just under \$6000.

Televideo's Telecat 286 was decidedly impressive at its retail level of \$6800 for the 20 Mbyte model and \$7800 for the 30 Mbyte machine. Both prices include video card and monitor, and are well above the 'special' prices to be had at the moment.

The TI is a little expensive at more than \$12,000, but the inspired engineering more than makes up for it.

I Can't Do It . . .

I had enough trouble selecting five machines from an impressive pack — so don't ask me to choose between them.

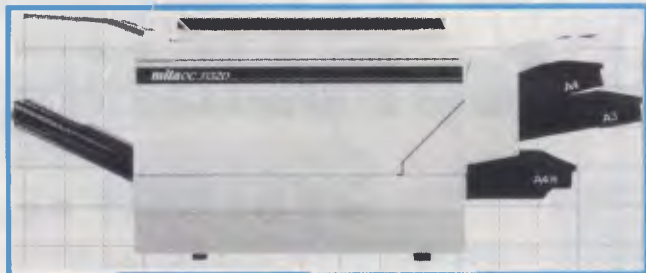
I loved the ECS machine's speed, but would be just a little nervous about compatibility problems unless I was buying it for the CAD-style applications it is purpose-built for — in that area it would be untouchable.

The ITT and the TI machines were also just my style but, again, I would have to be spending the boss's money before I could stretch to them.

The Televideo and the Osborne have won me, however — at the price they're close to unbeatable. □

MITA Copiers

- 30 copies a minute
- Auto duplex copying
- 4-cassette feed



DC — 313ZD

- Auto document feed (option)
- 20 bin sorter & collator (option)
- Easy-to-read fluorescent display panel



DC — 1001

- Letter perfect copies on plain paper
- 11 quick copies per minute
- Variety of copy sizes (foolscap max.)
- Stock bypass (like a second cassette)
- Convenient stationary plater

FORDIGRAPH Shredders



Ambassador 800

- Space saving design
- Shreds computer paper continuously
- Large shredder wastebin
- Powerful 1/2 H.P. motor



Ambassador 1300

- Handles 15" computer paper with ease
- Complete with work tray
- Large portable waste basket
- Up to 26 sheets at a time
- Choice of cutting widths
- Strong 1 H.P. motor



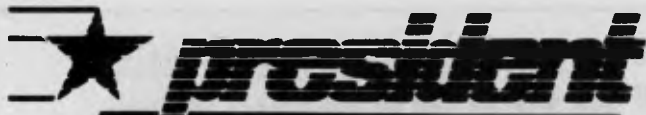
BARRIE'S (AUST) PTY LTD

Trading as BARRIE'S OFFICE SUPPLIES

617-649 SPENCER STREET, WEST MELBOURNE, 3003

P.O. BOX 4948, G.P.O. MELBOURNE, 3001

Telephone: 329 6500 Facsimile No. 329 2810



...The Australian way!

You don't have to pay for a President Desk Top Publishing System ...



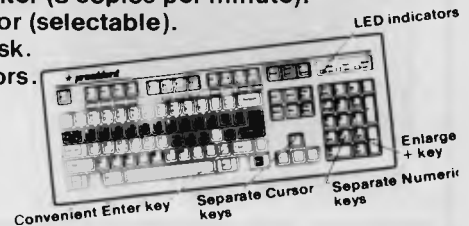
it pays for itself!

Check our features and you'll see why we're ahead of the rest.

The President 286 Publisher Computer (specially manufactured in Australia by President), linked with the AVR-300 Flat-bed Image Scanner and MEGAscan software will give you the speed and power required for professional publishing and office alike.

The President 286 System includes:

- Advanced Vision Research 300 Flat-bed Image Scanner and MEGAscan Software.
- Modified Canon based laser printer (8 copies per minute).
- 6-8-10 mega HZ 80286 processor (selectable).
- 47 megabytes voice coil hard disk.
- Optional E.G.A. or WYSE Monitors.
- 60 megabytes tape back-up.
- 1.3 megabyte MegaBuffer.
- CGA Monitor and Card.
- 1 megabyte RAM.
- A 101 Key Publishing Keyboard.



President Computers P/L Head Office
 Hornsby (02) 476 2700
 Bondi Junction (02) 387 7366
 Campbelltown (046) 26 8166

President Computers Victoria
 Carlton (03) 347 0555

President Computers Marketing
 Adelaide — Seeking Distributor

President Computers Queensland
 Labrador (075) 37 4641
 Ftude Valley (07) 52 3288
 South Side (07) 341 3258
 Darwin (089) 81 5905
 Perth (09) 328 6522
 Tasmania (003) 31 5302
 Albury (060) 21 4481
 Dubbo (068) 82 3833
 New Zealand (64) 9 790527
 New Guinea 6755 254422



...The Australian way!
DeskTop Publishing Division.

PAGEmaster DESKTOP PUBLISHING

Fast image scanning and printing of documents.

THE FIRST and LAST

WORD IN DESKTOP PUBLISHING AND IMAGE SCANNING ...

VENTURA DESKTOP PUBLISHING

Text manipulation and advanced typesetting facilities.

MegaGEM

MegaFREEZE

Mega^{OPTIONS} ...

GEM SOFTWARE

COMPATIBILITY

DOS
Wordprocessors
Spreadsheets
CAD CAM
LOTUS
etc. etc . . .

GEMdraw
GEMpaint
GEMwrite
GEMword

MegaOPTIONS

MegaSCAN
MegaFREEZE
MegaGEM
MegaFAX
MegaREAD
MegaFILE
MegaDISK

Image Scanning
Screen Capture
GEM Product Compatibility
Facsimile Facility
Optical Character Recognition
Image Archival & Retrieval
1.3meg byte RAM Availability

PAGEmaster can be configured to meet your own requirements

PAGEmaster Junior

MegaScan Software and Buffer Built to suit IBM or Compatible.

PAGEmaster I

PAGEmaster Junior plus PRESIDENT AVR300 IMAGE SCANNER, mouse, laser adapter & multi device adapter

PAGEmaster II

PAGEmaster I plus President Laser Printer - 300 dots per inch resolution - eight pages

PAGEmaster III

PAGEmaster II plus President 286 Computer - 44Mb Hard Disk (voice coil), 1 Mb RAM, 60 Mb Streaming Tape, C.G.A. monitor.

PAGEmaster IV

PAGEmaster III plus VENTURA Desktop Publishing and GEM.

IBM INDUSTRIAL STANDARD
HARDWARE & SOFTWARE
COMPATIBLE!

BORLAND ROUND-UP

Borland products are everybody's favourite things. Good quality, value-for-money, innovative programs, they come in the modern-day equivalent of Julie Andrews' brown paper packages tied up with string — el cheapo shrink wrapping. When his dog bites, when his IBM stings, John Hepworth simply runs one of his favourite Borland packages, and then he don't feel so bad.

Borland Round-up

THINK OF BORLAND, and what products jump to mind? Turbo Pascal for sure, and Sidekick as well, and Reflex: all hot sellers that have helped boost this young company to number four in the world of PC software sellers. Annual sales currently exceed \$A200 million and that's less than four years after Philippe Kahn (75% backed by European finance) founded the company in Scotts Valley, California.

Each of the four years has been an exciting record-breaker for Borland, with imaginative releases and new market developments happening every few months. Two of the most interesting developments for Borland in the last year were the acquisition of Singular Software (Cupertino, California) who had developed Interlace, a relational database program for Apple's Macintosh — now relaunched as 'Reflex for the Mac' — and the joint marketing arrangement made with Toshiba. The US market is now seeing the top-of-the-line Toshiba T3100 sold with both Sidekick and Superkey as standard, and the new T1100 Plus comes with Sidekick. And, Borland has put all of its IBM PC-compatible software on 9 cm disks — suitable for use with IBM's Convertible and Compaq's Portable II. (See *John Hepworth's review of the IBM Convertible*, 'The Little Blue Sportscar', in this issue.)

But this year, Borland's big news is in Europe: They've gone public on the London Exchange and have fired up an aggressive marketing campaign in the UK and France. The newly appointed Director of European Operations — Alain Bancquart of European MicroPro fame — is aiming to make Borland "Europe's largest microcomputer software publisher."

And there has been a rush of acquisitions aimed at strengthening Borland's hold on distribution — recently they acquired Fraciel, a French software distributor now renamed Borland International France, to give them a base for translating and distribution in that area, and they have bought a larger stake in their sole German distributor (and added the Borland name to the company).

Mention of the Borland name and distributorships brings us to what's happening here in the Antipodes (or not happening, as things stand now). The infighting for the exclusive right to market Borland's money-spinners in Australia started way back in mid-1984 and is still continuing amongst the five local software houses generally considered in the running for



the agency. At one time or another, each of them was convinced that it had the business sewn up, but, as one runner summed it up, "[Borland] had a change of plans and told us it was all off."

The only 'commitment' that Borland has made to date as a result of all the lobbying from this end, is that they indicated that they have decided to make a decision some time in the future regarding an Australian distributor and that, eventually, they will do the marketing here themselves. With Borland taking that (rather indefinite) approach, it speaks *very* well for Turbo Pascal, Sidekick and the rest of the stable that they have gained an active and enthusiastic core of dedicated users. And with *that* approach, it's not surprising that none of the local contenders have been actively promoting Borland — Why should they when someone else might get the agency next week, or Borland might... do what?

While there's no winner yet in the Borland stakes, the losers are the users (and Borland, too!). One industry pundit pointed out that the lack of strong, local support is costing Borland about half of its potential market here in Australia.

How was Borland's winning stable created in such a few years, and how have so many loyal customers been won over? The answer lies in the consistent creation of good products, with good user interfaces, at a fair price.

The stable now includes two languages (Turbo Pascal and Turbo Prolog), tutorials (Turbo Tutor), RAM-resident utilities for writers, programmers and other users (Turbo Lightning, Superkey and Sidekick), source code for applications (Database, Editor, Games and Graphics Toolboxes, and Word Wizard) and a database (Reflex and Reflex Workshop).

Turbo Pascal

Turbo Pascal was (and is) a revolutionary concept in compilers. Traditionally, compilers are expensive and inconvenient, requiring programmers to use a separate editor to create the source code and then going through a tedious compile and link cycle to produce the final executable program. As a result, many programmers use an interpreter (if available) to develop and debug source code, and only compile when happy with the interpreted results. This is fine if a matching interpreter and compiler are available in the language and dialect of your choice.

The Turbo Pascal system includes in the one program a powerful editor for the source code, using compatible keystrokes to Wordstar, and a fast compiler. If the compiler detects an error in the source code during a compile, it stops, jumps back to the editor, specifies the type of error detected, and positions the cursor at the error. The code can be compiled to disk (so the program is saved and may be run independently of the compiler), or to memory (allowing it to be run from inside the compiler during development). When the code is compiled to memory, run-time errors also cause a jump back to the source code, accompanied by information on the type of error and its position.

Turbo Pascal 3.0 is the current version. It creates only .COM files. Whispers of a future version 4.0 indicate it will offer the option to produce .OBJ modules which can be linked with other .OBJ modules created by Turbo Pascal, C, BASIC, Fortran and so on. In the meantime, the former BCD and 8087 support options are now standard on the MS-DOS and PC-DOS versions, allowing the compiling of programs with reals from 1E-63 to 1E+63 with 18 significant digits, and faster numeric manipulation, respectively.

Turbo Prolog

The other Borland language is the newly released Turbo Prolog. The promise of artificial intelligence has tantalised scores of programmers since the birth of the digital computer. While true artificial intelligence is a long way off, the creation of programs with quasi-intelligence is becoming a reality. Writing such programs in the conventional procedural languages, such as Pascal, BASIC Fortran, Cobol and so on, is nearly impossible. Prolog is a language which promises to make writing expert systems, if not artificial intelligence programs, a lot easier.



Chapter 16 TURBO EDITOR TOOLBOX CONSTANTS

Chapter 17 TURBO EDITOR TOOLBOX DATA TYPES

Chapter 18 TURBO EDITOR TOOLBOX VARIABLES

Chapter 19 TURBO EDITOR TOOLBOX PROCEDURES AND FUNCTIONS

This section describes, in alphabetical order, the Turbo Editor Toolbox procedures and functions. The call-up for each procedure or function is given, followed by a detailed description of its function. Remarks and restrictions are given where appropriate, as well as cross-referencing to related procedures and functions. The Turbo Editor file that contains the procedure or function is given in brackets next to the name of the procedure or function.

Advance [CMD.ED]

Declaration procedure Advance;
Usage Advance;
Parameters None
Function This routine is local to *EditRightWord*, and is used to move the cursor rightward one character, moving to the beginning of the following line if necessary.

EditAbort [INPUT.ED]

Declaration procedure EditAbort;
Usage EditAbort;
Parameters None
Function This routine aborts the typeahead buffer. It sets the global variable *Abortcmd*, which should be checked by any procedure that does input. It then calls *EditErrormsg* to display a message on the command line and clear the typeahead buffer.
Remarks In the default editing system, this is the only command processor that is called from *Pokechr* instead of *Getchr*. This ensures that it will be called first.

The Editor Toolbox Technical Reference (Part IV of the manual) is almost a toolbox itself — the clear, easy to follow explanations give detailed coverage of the constants, types, variables, procedures and functions available.

Most Prolog implementations are interpreters, while Turbo Prolog is a compiler, creating either standalone .EXE files ready to run, or .OBJ modules for linking. Like Turbo Pascal, it has a built-in editor, using Wordstar-compatible commands, and drops back to the editor during compiling or while running programs from inside the compiler.

How many copies of Turbo Prolog will Borland sell? The sceptics said of Turbo Pascal that only a few programmers would need such a compiler, and that pricing should be based on covering a lot of development time with a handful of sales. The quality of the product, and a price around 10 per cent of the traditional price of microcomputer compilers, saw around half a million sold. Clearly there are not this many commercial programmers out there — so many copies are going to interested users who want to dabble, to learn, to write little routines for themselves. The same could well happen to Turbo Prolog.

Turbo Tutor

Learning a new language is always hard work, made doubly so when textbooks are not available. When Turbo Pascal was first introduced, there were no specific books in the computer sections of bookshops for this dialect of Pascal. What texts were available were usually based on mainframe implementations, and did not cover the unique Turbo features and extensions.

To partially solve this problem, Borland released Turbo Tutor. Version 1 was a simple paperback book, which lead the user through the skills of Pascal, Turbo style. Packed with sample programs, the book also came with a disk on which were copies of all the programs in the book. Now Version 2 of Turbo Tutor has been

Reflex offers the choice of five different views of the data and can window several of them on the screen at the same time.

1/01/85	
Views	Edit Print/File Records Search Form
SALES RECORD	
MONTH: Jan-85	Field & Sort Settings..
STORE: Haven	Vary..
PRODUCT: UCrs	Add Record
# OF SALES: 567	Delete Record
SALES (\$000): \$333	Perform Sort
COST (\$000): \$281	Recalc
GR PROFIT (\$000): \$53	Clear Database
NOTES:	
Records Commands	

168	
Views	Edit Print/File Records Search List
MONTH	STORE
Jan-85	Haven
Jan-85	Haven
Jan-85	Haven
Jan-85	NewPark
Jan-85	NewPark
Jan-85	NewPark
Jan-85	Pierce
Jan-85	Pierce
Jan-85	Pierce
Jan-85	Tremont
Jan-85	Tremont
Jan-85	Tremont
Feb-85	Haven
# OF SALES	SALES (\$000)
567	\$333
349	\$173
470	\$112
398	\$387
193	\$138
168	\$64
537	\$319
219	\$113
188	\$71
278	\$143
234	\$129
153	\$59
618	\$488
COST (\$000)	
\$281	
\$588.01	
% MARGIN: 15.8 %	

Borland Round-up

released. The book has nearly doubled in the number of pages, the writing style has been refined, and now two disks are included. Even better, one of the disks is an interactive hands-on tutorial.

Source Code

One of the best ways to learn any language is to see examples of good source code. One of the fastest ways to speed up a project is to have a range of modules or subroutines pre-written for specific tasks, which can be grafted onto your own programs.

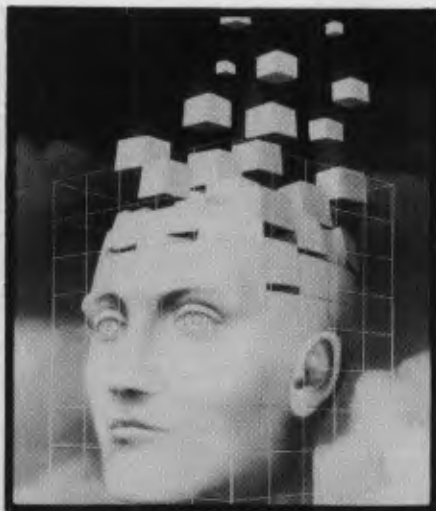
The four Turbo Pascal toolboxes offer a fantastic collection of prewritten routines and programs —

Editor Toolbox creates a Wordstar-style word processor (in a somewhat pared-down form). The manual starts with a tutorial on design and implementation of word processors, and then describes each subroutine on the disk with comments on usage and how to include it in your own programs. These routines are not limited to use in word processing. Say you're writing a database report routine and want to word-wrap a field down a column of a report. Routines in the Editor Toolbox will help this and many other tasks.

Graphics Toolbox is similar, making easier the writing of graphics routines which will be portable (at source code level) between machines with Color Graphics Adapters and Hercules boards. Windowing, window copying, curve fitting and many other tricks are supported.

Gameworks gives an insight into the programming of Chess, Bridge and Go-Moku. Source code and executable files for these games are provided.

The **Database Toolbox** includes B+ tree routines and QuickSort routines, ready for



inclusion in your database program. It even has a compact and ready-to-run database included for demonstration purposes. The Database Toolbox also has a general-purpose installation program for inclusion in your software, allowing the user to select the appropriate terminal configuration for your software and their system.

Word Wizard is yet another toolbox/tutorial. Written in Turbo Pascal, and with source code included, it uses the Turbo Lightning 'engine' to solve word games and crossword puzzles, while simultaneously demonstrating the methods of accessing those Turbo Lightning features.

Sidekick

Over half-a-million users are organizing their desk tops with Sidekick — the program that launched the rash of RAM-resident utility programs now on the market. Sidekick is loaded into memory before another program is run, and sleeps there until either the two shift keys or the Ctrl and Alt keys are pressed simultaneously. Then the other program is suspended and Sidekick takes over the screen.

Sidekick offers a mini word processor,

which can also read in a screen display from the suspended application; a calendar with appointments which can be scrolled forward or backwards by months or years; a calculator in hex, binary and decimal; an ASCII table in decimal and hex, which also shows on screen the true appearance of each character; and a dialler. Help is available at the press of a key.

Travelling Sidekick, an add-on program to Sidekick, creates appointments listings and generally takes care of scheduling a professional life, using files created by Sidekick. It comes in a nifty leather-look binder, with a solar calculator and forms for printing out all relevant data.

Superkey

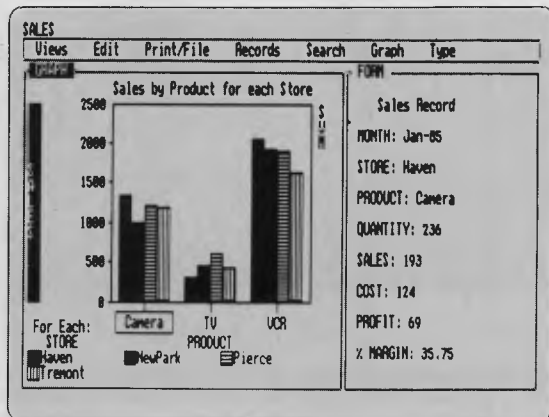
Do you have a program which requires a host of arcane keystrokes to achieve some simple, repetitive action? Then you could be a customer for Superkey, a keyboard enhancer which allows the creation and storage of macros which are invoked at the press of a single key and are seen by the application program as the whole original series of keystrokes.

Turbo Lightning

Turbo Lightning is a RAM-resident dictionary/thesaurus which promises to become the 'engine' for looking up all kinds of textual data. Initially it comes with a dictionary and thesaurus, and can do spell checking or offer synonyms. Proofreading can be automatic, beeping whenever you mis-spell a word.

In full screen mode, all words on screen are checked, and unknown words are highlighted. Alternative spellings for misspelled words (or alternative words from the thesaurus) can be selected, and Lightning can insert them into your application as if they came from the keyboard. ▶

Field	SALES			
Camera	TU	VCR	ALL	
1334	388	2856	3698	
1001	443	1922	3366	
1200	604	1910	3722	
1194	435	1618	3247	
4737	1790	7506	14033	



MONTH/STORE	PRODUCT	# OF SALES	SALES	% OF STORE	% OF MONTH	COM	EST
January							
Haven	Camera	230	193.0	11.3%	9.7%		
Haven	TV	242	80.0	11.3%	2.5%		
Haven	VCR	245	311.0	11.3%	14.8%		
Sub-Total For Haven:		657	654.0	100.0%	29.0%		
NewPark	Camera	193	193.0	11.3%	8.9%		
NewPark	TV	105	210.0	11.3%	7.0%		
NewPark	VCR	162	162.0	11.3%	6.8%		
Sub-Total For NewPark:		370	654.0	100.0%	25.8%		
Pierce	Camera	270	176.0	11.3%	9.3%		
Pierce	TV	100	92.0	11.3%	3.1%		
Pierce	VCR	257	210.0	11.3%	10.0%		
Sub-Total For Pierce:		677	654.0	100.0%	34.0%		
Trenton		274	100.0	11.3%	1.0%		
Trenton	Camera	161	35.0	11.3%	2.4%		
Trenton	TV	45	21.0	11.3%	0.9%		
Trenton	VCR	162	210.0	11.3%	9.8%		
Sub-Total For Trenton:		377	210.0	100.0%	20.0%		
Total For January:		3374	654.0		100.0%		
Sub-Total For Haven:		657	654.0	100.0%			
Trenton		377	210.0	26.8%			
Pierce		677	654.0	100.0%	25.4%		
Sub-Total For Pierce:		677	654.0	100.0%	25.4%		
Trenton		377	210.0	26.4%			

Borland Round-up

Lightning is compatible with most word processors, databases and other well-known applications.

Reflex

Reflex is Borland's revolutionary database. A totally RAM-based design, supporting the Intel/Lotus/Microsoft extended memory boards, it offers several 'views' of your data.

The List view arranges records in rows and columns, with each row a record and each column a field. Individual records can be seen one at a time in Form view. They look like cards in a card file, up to 500 lines high and 500 characters wide, and can have field names, prompts and headings selected by the user.

The Graph view demonstrates graphically the relationships between elements of the database. Crosstab analyses data into a table. Say you have four salesmen, each selling to the same four cities; Crosstab could make the columns cities and the rows salesmen, and add sales for salesman A in city B in the database and show the result in one cell, repeating the process for all other combinations of salesman and city.

The Report view is exceptionally powerful, with full and simple control of output format, including all the prompts, headings, subheadings, totals and subtotals that one could desire. Sorting within the database and report are independent, and can be done with multiple keys.

Reflex uses windowing to display more than one view at a time on the screen, and supports either the CGA or Hercules boards — it's exceptional in handling the latter. The program can also read in data



files from other applications, including Lotus 1-2-3, Symphony, dBase II and III, PFS, DIF and ASCII. During the translate process the records being imported can be selected by user-defined criteria.

Borland has recently released Reflex Workshop, which supports Reflex with 22 prewritten applications and a comprehensive tutorial. The applications range from financial management to project manage-

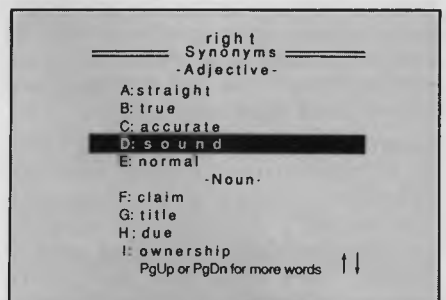
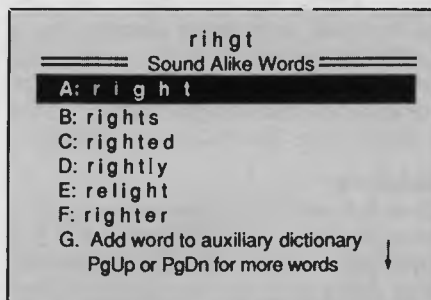
ment to arranging a conference schedule.

Quality and Value

As mentioned above, Borland is noted for its policy of offering a good product at a fair price, with good documentation. There are no packaging frills to soak up money — the manuals are well-written, well-printed and clear, but they are paperback books to save money on fancy binders, and the disks are merely slipped inside the manual and the whole lot is shrink-wrapped. As a result, pretty well any computer user can afford Borland products — and some, like me, have a copy of virtually everything ever released by the company.

Availability

All Borland products are available for IBM-PCs and clones, and some are also available for CP/M machines and the Apple Macintosh. The products reviewed came from PC Extras, (02) 319 2155; illustrative material was supplied by Software Source, (02) 389 6388, and Imagineering, (02) 662 4499. □

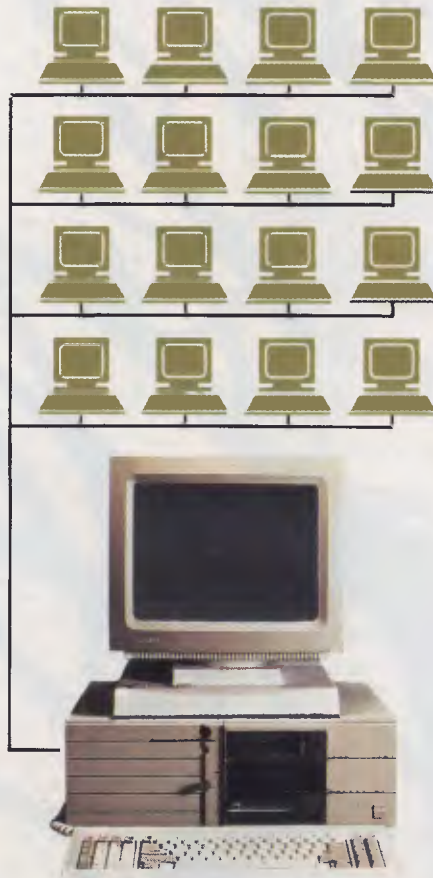


In full screen mode, Turbo Lightning checks the spelling of words as they are typed in — if it doesn't recognize a word, it sounds a "beep" and automatically lists similar words on the screen, allowing either a correction in the text or an addition to the dictionary. And, the thesaurus is just as easy to use.

Product	Disks	Memory Needed	Manual Size	RRP (tax Inc)
Reflex Workshop	2	384k	406pp	\$135
Reflex 1.1	3	384k	500pp	\$293
Turbo Prolog 1.0	2	384k	220pp	\$15
Turbo Lightning 1.0	3	128k	84pp	\$195
Turbo Pascal 3.0	1	128k#	386pp	\$200
Turbo Tutor 2.0	2	128k#	408pp	\$84
Graphix Toolbox	1	128k	256pp	\$135
Gameworks	2	192k	148pp	\$135
Database Toolbox	1	128k#	151pp	\$135
Editor Toolbox	2	192k	245pp	\$135
Sidekick (PC)	1	128k	122pp	\$152
Sidekick (Mac)	1	128k	175pp	\$152
Superkey	1	128k	165pp	\$168
Word Wizard	1	128k	40pp	\$130
Travelling Sidekick	1	128k	78pp	\$151

The Borland stable — Note that the programs marked with a hatch (#) require 64k RAM if they are run under CP/M-80. Note also, that the price quoted for Sidekick is for the protected version; the unprotected is \$110.

MORE BANG, LESS BUCKS.



The ITT XTRA XL* super micro has the performance to match mini computers that cost more than twice as much.

WE COULDN'T SAY THIS IF IT WASN'T TRUE:

The ITT XTRA XL is a new multi-user high performance super micro computer that rivals the performance of systems costing more than twice as much. There, we've said it, and it's absolutely true.

CHECK OUT THE PERFORMANCE

ITT XTRA XL works as a superb multi-user machine. A unique communications system maximises responsiveness for concurrent users. It combines the 80286 chip zero wait state memory, disk caching plus an additional processor to handle input/output. The result: A computer many times faster than similar systems.

FEATURE AFTER FEATURE:

- Xenix Multi User and PICK AT3/AT6 operating system.
- Up to 16 users using inexpensive ASCII terminals.
- Exceptional low cost per user – compare it to Wang, Dec, Data General and NCR minis of comparable performance.
- The ideal LAN engine. Protect and maximise your current investment by networking existing IBM PC's.
- 1.6MB of memory to a powerful 16MB.
- Up to 144MB of on-board disk with 60MB streaming tape.
- Immediate delivery.
- Nationwide service and support.

SYDNEY/CANBERRA: Peter Jackson
(02) 925 7272

BRISBANE: David Hall (07) 832 5511
MELBOURNE: Russell Scrimshaw
(03) 615 6666

ADELAIDE: Gerard O'Leary
(08) 42 5671


PERTH: Terry McAllister (09) 444 0211

BECAUSE DOLLARS ARE THE ULTIMATE BOTTOM LINE

STC

Business Communication Systems
5 Blue Street, North Sydney 2060

THE ORCHARD UNDER SIEGE



The desktop publishing Apple, a high-yielding fruit in the sunny Apple orchard, is likely to take a bruising from the introduction of Pagemaker for the IBM AT ... and there are other pests' on the apple-pie horizon. In this update on the sapling desktop publishing industry, Tim Hartnell explores all the juicy alternatives now open to you.



Desktop Publishing

THE WALLS ARE closing in on Apple. After more than 18 months of having the desktop publishing game basically to itself, the PC challenge is starting to be felt.

Steve Clemons is international marketing manager for Aldus Corporation, the folks who brought the world the number-one desktop publishing program for the Macintosh, Pagemaker. He told me recently that the profit reported by Apple in its last financial year was almost exactly the same figure as the amount of hardware sales which Apple told Aldus were created by people wanting to run Pagemaker. In other words, claims Clemons, Apple's recent profit has been due almost entirely to the near-stranglehold they had on real desktop publishing.

Of course, there have been some not-so-successful programs to bring desktop publishing to the non-Macintosh world, such as the ponderously slow Personal Publisher, and the okay-for-school-but-not-for-real-life Newsroom, but until recently, if you wanted to be involved on any meaningful level with desktop publishing, you had to wander into the orchard.

This gave Apple an atypical penetration into the corporate market. Most people who need computers to work with in Australia buy IBM PC clones. Those who needed to do desktop publishing, or wanted access to particular graphics power which was not provided by the clone world, bought a Macintosh. I was one of them. Although I am, at heart, a dedicated PC-person, I bought a Mac, a Laserwriter and the whole caboodle when I wanted to get involved with desktop publishing. I have never regretted it (although the keyboard might win an award as the least-ergonomic device ever invented by humankind). However, if 'real' desktop publishing software had been available for my PC, I'm sure I would have been tempted to buy the software, a much cheaper laser printer than Apple's, and possibly an Extended Graphics Adaptor and a 'go faster' board. More and more, I suggest, in 1987 we'll see those in the corporate sector who want to make use of the benefits of desktop publishing sprucing up their clones, rather than singing the Macintosh melody.

Certainly, that's the impression created by Aldus with PC-Pagemaker, and by Hewlett-Packard and their 'Document Description Language'. The aggressive home-grown clonemaker, President Computers, which puts its machines together on the

Pagemaker for the PC is fast, even faster than Pagemaker on the Mac. You need an IBM PC AT or compatible (the XT's and PCs are too slow for the program to run satisfactorily), with at least 512 Kbytes of RAM, a 10 Mbyte or larger fixed disk, a mouse, and an IBM Enhanced Graphics Adapter or Hercules Graphics Card.

hi-tech Gold Coast, is backing the PC horse, of course, but with a whole system, sold as a job lot — scanner, XT-clone, laser printer, 'Pagemaster III' software. Here we'll look at these three approaches to giving desktop publishing power, as well as checking out the latest developments in the Apple world. The PCs might be muscling in, but Mac will not go down without a fight.

PC Pagemaker

Pagemaker for the PC is fast, even faster than Pagemaker on the Mac. You need an IBM PC AT or compatible (the XT's and PCs are too slow for the program to run satisfactorily), with at least 512 Kbytes of RAM, a 10 Mbyte (or larger) fixed disk, a mouse, and an IBM Enhanced Graphics Adapter or Hercules Graphics Card. The program runs under Microsoft Windows, and — as a general rule — Software Corporation of Australia (the importer of the program) says any clone which will run Windows will be able to run Pagemaker.

You can see that if you have a plain-vanilla PC clone, running at 3.7 MHz and just with twin floppies, you'll need to do a bit of pricey upgrading before you'll be able to run Pagemaker. However, such upgrading will probably be cheaper than junking your PC and buying a Mac and Laserwriter.

As I pointed out, the program needs a 10 Mbyte or larger fixed disk, and needs to be run on an AT. If you've got an XT with

fixed disk, you'll be able to run Pagemaker, but it will be too slow to be of much use to you. There are a number of low-cost 'go faster' cards which can be added to an XT to give it near-AT performance. Note that you need the EGA or Hercules card in order to run the program satisfactorily. Pagemaker will run on the standard IBM Colour Graphics Adapter, but its 640 by 200 resolution is nowhere near high enough to allow you to use the program properly.

The program supports many popular word processors, including Word Perfect, Microsoft Word, Multimate, Wordstar 3.3 and Xywrite III. And, as you'd expect, you can pump ASCII files directly into it.

The most expensive part of an Apple desktop publishing system is the Laserwriter. By going the PC route, you get access to much, much cheaper laser printers. Pagemaker on the PC can print to any Windows-compatible printer, such as the Hewlett-Packard Laserjet and Laserjet Plus. The release of Pagemaker for the PC is a significant event in the developing history of desktop publishing. Many, many people have been waiting for it to become available.

Pagemaker is distributed in Australia by Software Corporation of Australia, (03) 699 7255) and (02) 211 4099.

President Computers

Pagemaker's market will come largely from those who already have their AT's, and want the software. President Computers believes there is another market, of companies which either do not have an AT clone, or have so many of them another one wouldn't hurt. President's desktop publishing solution is a \$23,000 (plus tax) package of President's own ATalike with a hard disk, a Canon AI Laser Printer, a scanner, and the Pagemaker-like software Pagemaster III.

It is a fast and impressive system — the inclusion of a scanner in the package is a good idea. The scanner, a President AVR-300 Image Scanner, is swift and accurate — it's a 'flat-bed' unit (like a photocopier) which means you can scan pages from books and magazines, in contrast to many scanners which demand a single page be fed into the system.

President's system was launched in late-October, last year, coinciding with a similar announcement in California by Advance Vision Research, the company which developed the system. Despite its American parentage, the President-▷

Desktop Publishing

badged system is assembled in the Sunshine State.

I gained the impression, when watching a demonstration of the Pagemaster III software (which runs under Digital Research's GEM — a route which Aldus says it considered, but rejected in favour of Microsoft Windows) that it was very fast, and easy to use, employing a Mac-like user interface, controlled by a mouse. It is a real, genuine what-you-see-is-what-you-get-folks system. President offers just two hours on-site training as part of its package, which suggests the company is confident this is all that is needed to get creditable results. Certainly, Pagemaster III looks very much like Pagemaker, and a first-time user should have little trouble in producing simple documents, with more sophisticated output after a little more experience.

What do you get for your money? For a start, the AT-clone comes with a 30 Mbyte hard disk, and a 60 Mbyte internal tape back-up, 1 Mbyte RAM on the motherboard, two 1.2 Mbyte/360 Kbyte disk drives (so you can use them as quad-density, or drop back to the standard 360 Kbyte), colour graphics card and colour monitor, the image scanner, and the Canon Laser Printer (with an adapter so it can be driven from the AT). The operating system is MS-DOS 3.10a, and in addition to Pagemaster III, you get President's own word processor (President Write), their spreadsheet (President Calc), and a diary/planner program.

So, you get a lot for your \$23,000 (plus tax). The system seems sound, and because it is all supplied as a package, you won't be forever trying to find cables to link all the bits together. There is no doubt the system works well, delivers what is claimed for it, and for the price represents value which three years ago would have been inconceivable. Is there a market for it? President obviously thinks so. As I suggested earlier, the market seems to be limited to those organisations or individuals without a computer or laser printer or anything, who want to get into desktop publishing and, for some reason, don't want to go the Apple route; and to those companies who have PCs coming out of their ears, want to become desktop publishers, and feel an additional computer wouldn't go astray.

If you want to know more, and want to see the system in action (and it's pretty impressive, believe me) you can call President's head office on (02) 476 2700 for the name of your nearest dealer.

One of Apple's real advantages is that, during its virtually unopposed control of the market, many other companies went to work with a will to provide products which would stretch the possibilities of desktop publishing.

Hewlett-Packard

The control language Postscript enables the Apple Laserwriter to perform its many wonders. Postscript, developed by the United States company Adobe Systems, translates the on-screen representation of text into information the printer can use. It is transparent to the user. That is, you don't have to know anything about Postscript in order to be able to use it. You just turn part of the text on your screen into bold, and make the headlines bigger than the body copy, and put a little graphic here, and a thick blank here, and Postscript automatically converts this into the data the printer needs in order to print the page out. Page-description languages enable computers to perform a variety of graphics-oriented functions easily, including controlling type styles and sizes, drawing lines and arcs, and filling blank spaces with patterns.

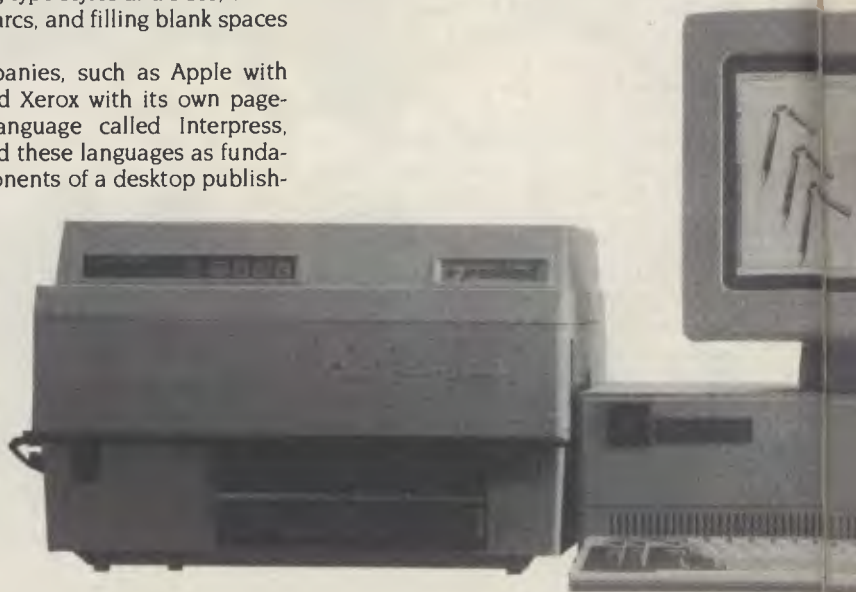
Some companies, such as Apple with Postscript, and Xerox with its own page-description language called Interpress, have embraced these languages as fundamental components of a desktop publish-

ing system. HP claims that although page-description languages have a place in the market, they suffer from one fundamental drawback: memory demand. Page-description languages eat up a lot of memory. On the Mac, for example, Postscript resides in ROM on the printer-controller board, boosting the memory requirement (and, of course, the price) of the Laserwriter. HP claims the majority of today's desktop publishing needs do not require the added capabilities — nor the added expense — of a page-description language.

Although there are more Hewlett-Packard Laserjet (and Laserjet Plus) printers installed world-wide than any other brand of laser printer, until recently they have been somewhat limited compared to the Apple Laserwriter. The HP printers were fine if you made limited demands, and saw them essentially as quiet daisywheel replacements.

(In fact, HP encouraged users to see the printers as very ordinary, by supplying only one typeface (Courier) which looks just like a typewriter. It is beyond me why HP thought a company which bought a laser printer would want the output to look like typewriter output, rather than like the output of a typesetting machine. Typeset-like fonts were available, as 'optional extras', for around \$500 a plug-in font cartridge, and these allowed a limited number of fonts to be in use at a time, with limited headline sizes.)

Despite these limitations, HP's reputation for technical quality control, the fact that it was the first serious player in the laser printer stakes, and its installed base



of other HP equipment, have all contributed to the fact that there are more HP Laserjets in use than any other make. HP has also strongly supported software developers, so just about any major software in the world which supports laser printers will specifically work on an HP Laserjet.

At the beginning of this section of the article I talked about Postscript. This language has become the de facto standard for laser (and other, more sophisticated) printer control. HP printers do not speak Postscript. To get around this, HP has adopted a document-description language, DDL, developed by the United States company Imagen Corporation.

DDL appears to incorporate all the graphic control features of other page-description languages, such as Postscript, along with control of such operations as merging text and graphics. Under the terms of HP's agreement with Imagen, DDL is being implemented for existing and future HP printers and personal computers.

HP has a good, solid, expensive PC clone called the Vectra, and the company is pushing this, a Laserjet with DDL, and specific software as its 'desktop publishing solution'.

As we discussed earlier, printer-control languages mediate between the software application and the printer to describe how a set of images will be rendered on the printer. DDL describes a document in two sections: as a collection of images, and as a set of rules for placing these images on paper. These two sections are

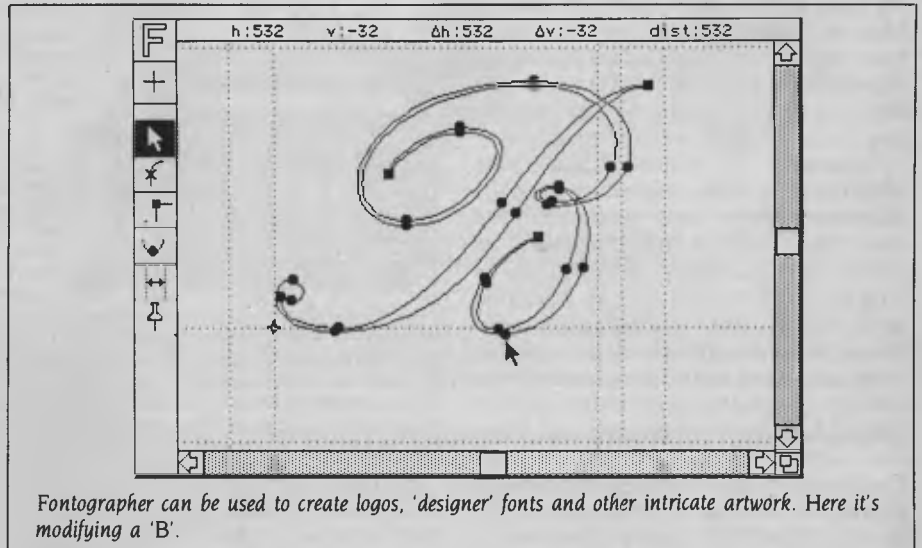


merged only when the document is actually printed. According to Walt Sledzieski of HP's Laser Printer Division, this separation of image from rules increases the per-

view, HP is pushing its own equipment, and the capabilities of DDL, as a sensible upgrade path to allow companies who already have some installed computer equipment to move gently into desktop publishing.

I tend to agree with HP. Most users of 'desktop publishing' are really users of typeset-like, 'pretty' output. They have no real need for, nor the time and skills to produce 'book-quality' documents. They simply want their internal documents to look as good as possible, without demanding excessive work.

It may well be that the HP path is one you could profitably follow. If you decide



Fontographer can be used to create logos, 'designer' fonts and other intricate artwork. Here it's modifying a 'B'.

formance for sophisticated applications.

Imagen's big boss, Patrick Welch, says DDL "takes the capabilities of the basic page description languages several steps further, by allowing the user to define entire documents, rather than just pages."

We've seen that there are companies, such as Apple and President, which are promoting the purchase of dedicated desktop publishing systems, which may or may not be compatible with existing office equipment. Hewlett-Packard believes that, for most users, a desktop-publishing system should be seen primarily as an enhancement to a company's existing hardware/software base. As a result of this

the Laserwriter is too expensive, or simply too feature-laden for your needs, an HP Laserjet is worth considering. But, before you buy HP's printer, you really ought to look at the other ones in the same, and lower, price brackets, such as Australia's own Impact printer, or Canon's Laser 1.

Despite the claims made for DDL, my experience has been that trying to produce more than rudimentary typesetlike output on the HP Laserjet can be a frustrating and difficult experience. I used a Laserjet for a month, and then went out and bought an Apple Laserwriter. You can draw your own conclusions.

If you want to know more about HP's approach, ring 895 2895 in Melbourne, or their STD free number 008 033821.

Apple Computer

That brings us neatly back to where we began, in the orchard, with the folks who started the desktop publishing revolution, and appear, to some observers, to be in ▶



President's desktop publishing solution is an their own AT with a 30 Mbyte hard disk, a Canon Laser printer, a scanner and Pagemaster III.

danger of losing their commanding control of the field.

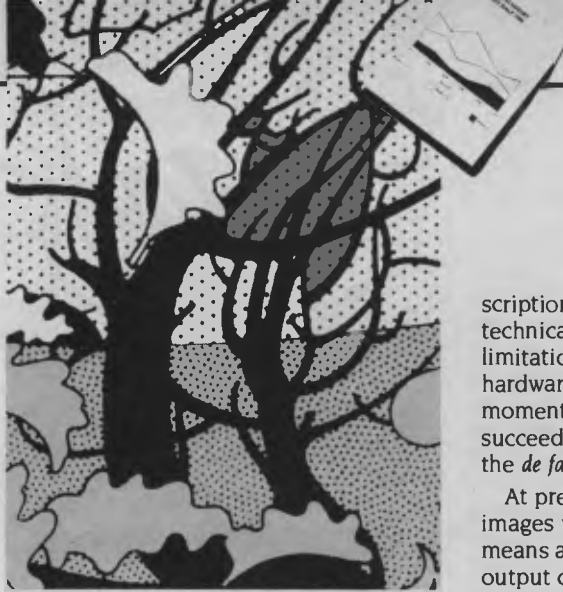
Apple is not sitting back waiting for its prize market to be pinched from underneath it. One of Apple's real advantages is that, during its virtually unopposed control of the market, many other companies, such as Aldus with Pagemaker, went to work with a will to provide products which would stretch the possibilities of desktop publishing. These third-party developers have continued their work — let's look at some of the more interesting and significant of these developments.

PageMaker on the Mac has been one of the driving forces behind desktop publishing. But the program was not without flaws, as anyone who has used it for more than the most trivial tasks will agree. Pagemaker 2.0, due out shortly for the Mac, will incorporate all the new features now in the PC version of the program.

Pagemaker 2.0, claims Aldus, offers more than 20 new features which previous Pagemaker users have requested. The main ones are automatic hyphenation based on a dictionary of 90,000 words (and Steve Clemons claims an Australianised version of the dictionary, rather than the usual Yankee-speak, will be available here), as well as user-defined entries; increased typographic capabilities, such as manual kerning on all printers, and automatic kerning on selected printers (kerning adjusts the space between characters), as well as other word spacing and letter control; the ability to produce documents up to 128 pages in length; and the ability to work on facing pages at the same time.

Steve Jobs, the truant half of the pair who conjured up Apple in that Californian garage, is now thumping his own drum with his new company Next Incorporated. At a desktop publishing convention in San Francisco, he pointed out that, within the past 10 years, word processing has virtually become an inbuilt generic function of all computing systems. He said that, at the moment, we're in a transition with desktop publishing from seeing it as an add-on to current technology, to a generic function. He said it would only take until the end of 1989 for this move to be made. Within five years, Mr Jobs predicted, every computing system would have desktop publishing capabilities built into it.

Jobs said new full-page displays will be easier to use, and much more powerful hardware would be developed to handle them. He claimed Postscript has already won the battle as the standard page de-



scription language, as it has the right technical approach, and any performance limitations would be overcome by new hardware. There is, says Jobs, "too much momentum behind Postscript for it not to succeed", so it would eventually become the *de facto* imaging standard.

At present, the Laserwriter produces its images with '300 dots per inch' (dpi). This means a solid black square inch of printed output consists of a square of 90,000 (300

BUILDINGS OF THE PALO ALTO NEIGHBORHOOD



Though not known for its outstanding architecture, Palo Alto, California has many buildings which please the eye and add to the overall ambience of the community. The old main post office, for example, is a lovely assemblage of columns and ornate balustrades. Built in 1943, the building was used as the main post office until 1984, at which time the modern facility near the freeway was constructed.

Our neighbor to the north, San Francisco, is well known for its charming Victorian homes. Palo Alto is not without its displays of old-world class. In particular, the downtown area boasts numerous examples of classic

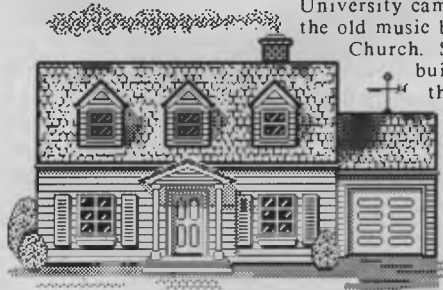
Victorians. Many have been painted in multitudes of colors with painstaking detail paid to borders and trims. They are truly delightful!

Of course, the traditional home of the '50's is alive and well on our quiet neighborhood streets. Though overwhelmed by Eichler homes in South Palo Alto, there are a number of classic homes to be found in the area near Oregon Expressway. Many of the homes were built just before the rapid expansion and re-apportionment of property and lot lines in Palo Alto, so they have the added benefit of huge back yards, and frequently are surrounded by more trees than the homes of later build.

The only problems with the homes of Palo Alto is their cost. This neighborhood is one of the most expensive in which to buy property in the entire U.S. A home can hardly be found for under \$150,000, and even the smaller homes are well into the \$200,000's. It is remarkable to think that only 15 years ago, many of these were selling for less than the cost of a 1986 BMW 318i.

Many of the most notable buildings of Palo Alto are actually located on the Stanford University campus. Among these are the President's home, the old music building, and the famous Stanford Memorial Church. Stanford also boasts some of the ugliest buildings to be found in the area. In particular, the Meyer Undergraduate Library is known as "UGLY" for short by the students. Hoover

Continued



Palo Alto architecture represents periods from Victorian to modern.



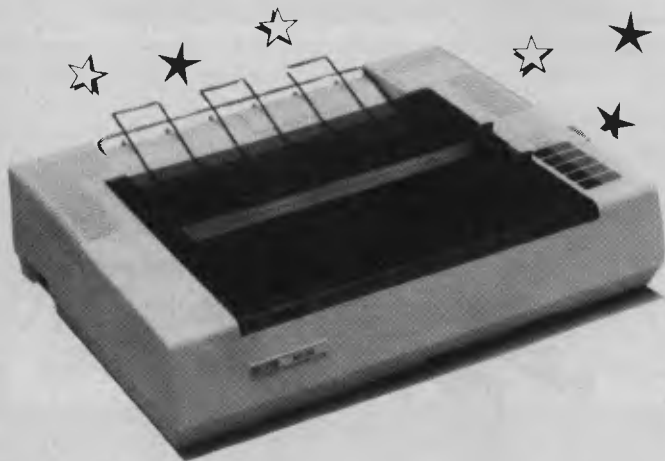
Hewlett-Packard's Document Description Language describes the document as graphics and text separately and merges them only when printing out — an advantage in sophisticated applications, it's claimed.

HANGOVER SPECIALS!

If you were too tired and emotional during December to take advantage of our specials, then we have a big bag of goodies for you for '87.

High resolution colour
ADI-PX22 640 x 350 EGA
 14" with tilt and swivel base .. \$1050
EGA Video Board emulates CGA
 and EGA with 16 colours \$550
 or both the above \$1500

NEW RELEASE



Nakajima Dot Matrix Printers
AR-50 200 CPS 80 col with pull tractor
 feed, IBM and Epson emulation
 near letter quality \$799.00
AR-100 as above 132 col ... \$999.00



As usual we can supply Software, Printer Paper, Special Cables, PC/XT/AT plug-in expansion boards, Fanfold Sticky Labels, Floppy Discs & Drives, Modems, NEC & Epson Printers, Laser Printers, Maths Co-processors, Intelligent & Helpful Advice and above all else GREAT SERVICE. If you can resist all of that but would like to know more just clip the coupon and we will send you our latest price list and newsletter.

To: Hales & Rogers.

Please send me the following item/s.

.....

Name

Address

Postcode

Price List & Newsletter only.

Add \$5 for each order post & packing.

Cheque enclosed \$.....



Please charge my Bankcard Master Card

.....

Signature:

Expiry Date:

Adco-HR/FP187

Hales & Rogers
 Pty. Ltd.

5 Mobbs Lane, Carlingford 2118
Tel. (02) 858 5322

Warranty: All products sold are covered by the manufacturer's warranty.

Sales Tax: All prices include sales tax. We can supply tax free, please call for prices.

Sources: All products are sourced from the authorised Australian distributor and carry their full support.

Prices: Are subject to change without notice. Please check before ordering.

Stock: We endeavour to keep stocks of the more popular items at all times. Delivery usually overnight providing your order is in before noon!

times 300) dots. Professional typesetting machines are typically four or eight times this (1,200 dpi, or 2,400 dpi), but 300 dpi is pretty good, and is more than acceptable for most applications. Jobs predicted a convergence at 400 dpi, covering FAX machines, scanners and third-generation laser printers.

So much for the future. What is available now for Mac-publishers? In the hardware line, three United States companies are making bigger screens. One of these is the 38 cm FPD from Radius, and is designed to work 'on its side', so you can see a full page at once.

Infomagic, (02) 858 4111, handles Radius products in Australia.

The second is Micrographic Images' 48 cm display, Megascreeen, with a resolution of 1024 by 900. Finally, E-Machines is marketing a 42 cm display called Big Picture, with a resolution of 1024 by 808.

Two new, non-Apple disk drives have just become available in America. One of these is called Drive 5.25, from Abaton Technology Corporation. This package consists of both hardware and software for the transfer of files between IBM PCs and Macs. The system can read and write IBM, CP/M and Unix disks, and can also work as a standalone CP/M computer. FT100 is a software package which transfers MS-DOS files from PC to Mac. It was developed by Dayna Communications. The second drive, sounding more like a weight-control product, is the MacSlimline Series, from the company Univation. It's an external hard disk subsystem, complete with a removable 10 Mbyte Winchester hard disk, or a 40 Mbyte optional tape back-up unit.

And a swag of software has been released over the past four to six months. Even though not all of it is available in Australia, it is interesting to see the kind of desktop publishing software which is being sold, if only to show the areas where people are working on new developments.

ACTA, from Symmetry Corporation, is an outline processor which integrates with many other programs. Dualtext, from a company with the natty name of The Electronic Publisher, is a complete automatic copy-taking and inter-office communications system, which works using the standard telephone network. The Electronic Publisher also has a product called Newswrite, which is a word processor designed for authors and journalists, and includes fonts, editing, glossaries and copy-fit. Extra, is an integrated desktop publishing program, which includes a word processor,



graphics, typesetting capabilities and a spelling checker — from Quark Incorporated.

Desktop Art, from Dynamic Graphics, is a set of five double-disk packs, with each pack containing around 200 to 300 graphics, including animals, common objects, individuals, famous personalities (including Jesus complete with crown of thorns, and Rembrandt with palette), seasonal symbols (like Father Christmas and fire-crackers), silhouettes, and design elements. The first two packs are MacPaint documents (so they are 75 dpi), but the other three (which have the titles 'Education', 'Sport' and 'Four Seasons') include MacDraw and FullPaint documents at 300 dpi.

Desktop Art is handled in Australia by Dynamic Graphics, on (02) 660 0211, or STD-free 008 22 5319.

For the past 20 years, Dynamic Graphics

has sold a monthly publication of camera-ready 'clip art', called the Clipper Creative Art Service. This was, of course, provided as hardcopy material. Now, moving with the times, Dynamic offers a Macintosh version of the Clipper service, with a disk each month. This Clipper art, although still with an American flavour, includes useful Australian items, such as recent disks which included pictures of the Opera House, and camera-ready material for use in conjunction with Australia Day.

Just Like Magic

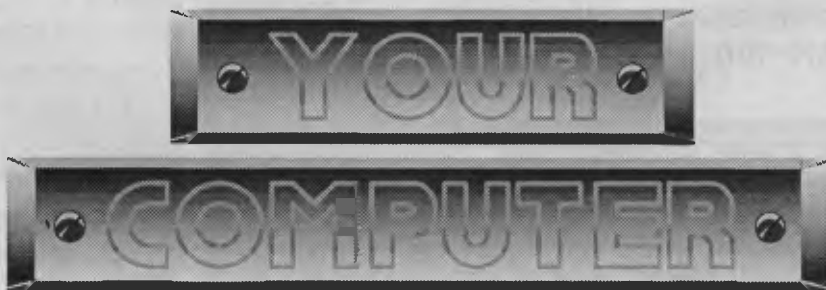
Also in the graphics area is Graphic Works, from Mindscape, which is a paint program which works in layers with Laserwriter fonts and multiple pages. Fontographer, from Altsys Corporation, is now in its second incarnation (version 2.0), and is a package to create logos, fonts and intricate artwork.

Fontographer is also distributed in Australia by Infomagic, (02) 858 4111.

In addition to Fontographer, Infomagic handles a wide range of Macintosh 'goodies for desktop publishers', including the 'sideways' monitor (from Radius) mentioned earlier. The most significant new product recently brought to Australia by Infomagic seems to me to be Ragtime, a program advertised under the slogan 'In-▷

YOUR COMPUTER

YOUR COMPUTER



True laser fonts can be scaled without losing definition — these examples from Image Club (in Paintbrush, Chrome Bumper and Brass Plate) could be 'blown up' and used much larger.

EARTH

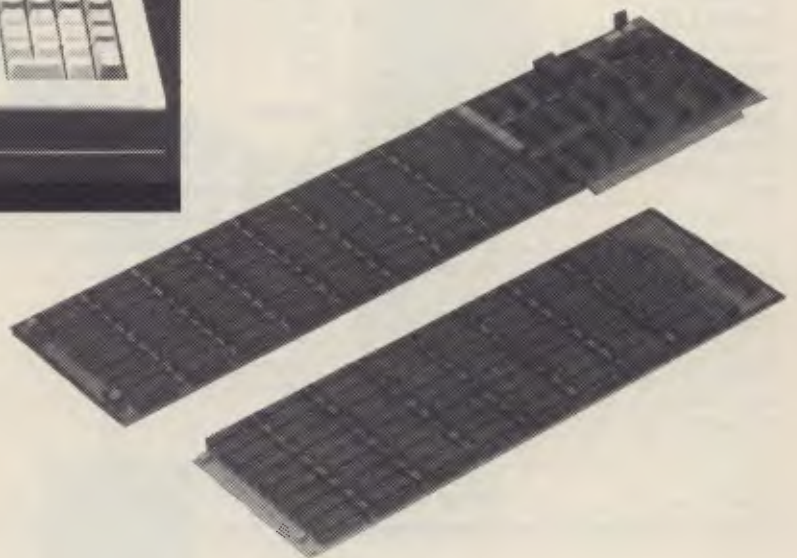
Earth Computer Systems ECS range are the fastest XT compatible computers available. The user is provided with the ultimate in processing performance with access to the very wide range of XT usable software available, yet processed at speeds far greater than that of AT type computers. This performance is available from just \$3995 ex tax.*



The Earth Computer Systems Extended Memory Module (EMM) and Expansion Card (EMMX) allow for 4 Mbytes of EMS compatible memory in one PC/XT slot.

By conforming to the LIM-EMS specifications, 100% compatibility with LOTUS-123, MICROSOFT WINDOWS and many other applications is assured.

Configurations from 1 to 8 megabytes are available, prices start at \$650 ex tax for 1 megabyte.



EARTH
COMPUTER SYSTEMS

2/15 Brisbane St, Eltham, Vic. 3095.
Ph (03) 439 4900 FAX (03) 431 1425

*ECS 286-20, 25 Mbyte Hard Disc,
10 Mhz 80286, 640 Kbyte RAM, 2 serial,
1 parallel, 1 F.D.D., MSDOS, GW BASIC

FREE CATALOGUE!
SEND SELF-ADDRESSED
A4 SIZE ENVELOPE WITH \$1.00 STAMP

DISCWARE

the biggest range of PC products AT THE BEST PRICES

Olivetti M24 Hard Disk \$5490

640KB RAM, 20MB internal hard disk, 360KB floppy disk drive, parallel and serial ports, hi-res green or amber monitor, 6 month warranty.

Inboard 386/AT \$Call

Feel the power! The state of the art high performance 32 bit 16 MHz plug in board for the AT.

Hyperace 286 + 10 MHz \$890

The Australian designed speed-up card.

Clipper Autumn '86 \$Call

The multi user version now available.

EGA Monitor & Card \$1,425

SUPER SPECIALS FOR THIS MONTH ONLY

Miniscribe 72 MB	\$2990.00
Le Modem	\$360.00
Seagate 30 MB	\$1190.00
Hypertec 512 KB M/Function Card	\$409.00

Draflx 1. \$695

The first high performance CAD software everyone can afford.

Low-cost, high performance computer-aided design & drafting (CAD) software is finally available for use on your PC. There's never been a professional CAD package so complete at such a low cost.

Olivetti M24 SP \$Call

8086 @ 10MHz, 640KB, 20 MB, limited stock.

The SBT Database Accounting Library in dBASE III. Free source code in every box.

dProfessional Time & Billing	\$695
dOrder Sales Order Processing	\$395
dInvoice/dStatement Accounts Receivable/Inventory Control	\$595
dPurchase Purchase Order	\$395
dPayable Accounts Payable	\$595
dLedger General Ledger/Finance	\$695
dAssets Asset/Depreciation	\$595
dProject Project/Job Accounting	\$695
dBackup Menu/Backup	\$99
Multi-user version available	

IBM SOFTWARE

	RRP	Our Price
Borland's Superkey	169.00	119.00
Clipper Compiler dB III	1349.00	899.00
Copywrite	125.00	95.00
Crosstalk XVI	315.00	199.00
dBase III plus	1470.00	945.00
Fastback	299.00	250.00
Framework 2	1395.00	1050.00
Graftalk 4.08	1350.00	1199.00
Harvard Total Project Manager	1049.00	699.00
Harvard Presentation Graphics	849.00	569.00
Lattice 'C'	995.00	875.00
Lotus 123 rel. 2.01	1099.00	650.00
Microsoft Word V.3.0	999.00	745.00
Microsoft Word V.3.0 Mouse	1299.00	945.00
Mirror	145.00	109.00
MultiMate 3.3	1199.00	745.00
Notebook II	370.00	339.00
Norton Utilities 3.1	175.00	149.00
Open Access V.2.0	1299.00	899.00
Paradox	1470.00	959.00
PC Alien	105.00	99.00
Reflex 1.1	298.00	229.00
Super Calc 4	895.00	599.00
Symphony 1.2	1470.00	959.00
Side Kick ver. 1.5	109.00	85.00
TK! Solver 1.6	599.00	499.00
Timeline ver. 2.0	890.00	670.00

IBM SOFTWARE

	RRP	Our Price
Turbo Lightning	225.00	149.00
Turbo Pascal, 8087, BDC'	fr 125.00	fr 85.00
Turbo Prologue	200.00	149.00
TypeQuick	87.00	84.00
Word Perfect 4.1	879.00	659.00
Wordstar	599.00	350.00
Wordstar 2000+ rel. 2.0	950.00	599.00
Wordstar Professional	849.00	485.00
Products not listed: call for best price	call	call

MDDEMS

NetComm 3+12 modem	\$229.00
NetComm Smart 123A	\$1050.00
NetComm Smart 1234	\$1290.00
NetComm Smart 2123	\$539.00
NetComm In/Modem	\$360.00
NetComm In/Modem 1234	\$1190.00
NetComm In/Modem 123	\$790.00
NetComm Smart 2400	\$899.00
NetComm Smart 1200	\$629.00
NetComm Trailblazer	\$Call

IBM HARDWARE

SAM Computer Phone Answering	\$660.00
VoiceCommand	\$1290.00
Cipher 25MB tape	\$1890.00
20 MB Drive Card	\$1450.00
Intel Above Board	\$599.00
Hercules Ram Font	\$499.00
Qubie 20MB hard disk	\$1050.00
Qubie 44MB hard disk	\$2600.00
Qubie 5 Pak 384KB	\$429.00
8087	\$279.00
Taxan Super Vision IV	\$1290.00
Sigma Color 400	\$990.00
Taxan Super Vision III	\$839.00
Qubie color monitor	\$699.00
Irwin 10MB tape internal	\$1150.00
Irwin 10MB tape external	\$1590.00
AST 6Pak with Sidekick	\$379.00
Microsoft Mouse	\$295.00
Tandon 20MB hard disk	\$1049.00
Toshiba P351 Printer	\$Call
NEC P5 Pinwriter	\$1800.00
NEC P6	\$880.00
NEC P7	\$1190.00
NEC ELF Spinwriter	\$799.00
Brother M1509	\$829.00
Epson LQ1000	\$1490.00



Prices apply to stocks held as at 1/12/86.
Availability may be limited at prices advertised

Call for specials and sales-tax exempted prices: (02) 212-6933, Call in, order by phone, or send cheque or money order to: DISCWARE, 5th floor, 3 Smail Street, BROADWAY NSW 2007 TLX: AA23509. For all products not listed call (02) 212-6933. Viatel * 778 000#

DISCWARE

the best amongst the best

KAYPRO PC

the non-obsolence PC

NEXT YEAR'S TECHNOLOGY?

That's easy. Replace the existing IBM PC AT board with an IBM PC AT-compatible board, available now. IBM 32-bit standard, available soon, or whatever the future holds.

MEMORY-HUNGRY SOFTWARE?

The Discware Kaypro comes standard with 768 KB — and if that's not enough, plug in an Above-Memory board of your choice.

HIGH-RESOLUTION GRAPHICS?

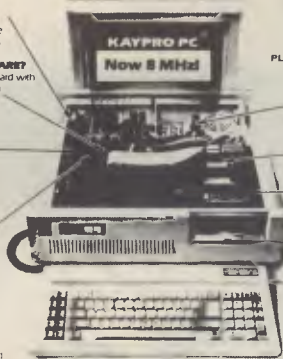
KAYPRO's standard multivideo board features perfect monochrome clarity plus high-resolution colour (IBM CGA). But, if it's IBM EGA that you want? — simply snap in a board.

FURTHER SYSTEM EXPANSION?

But of course! The KAYPRO PC is ready for anything. With six available slots, add what you need — networking, modems, more memory — the sky's the limit.

MONITOR

A large range of monochrome and colour monitors available.



NOVELL ADVANCED NETWORK

Network your Kaypros with Novell's Advanced Network (Netware®). Let us design a network application for your business needs.

PLENTY OF STANDARD FEATURES?

POWER SUPPLY:

A generous 1.12 watts of power for even the most demanding hard drive.

FLOPPY DISK DRIVES:

Dual IBM-compatible floppy disk drives, standard or side in the drive of your choice.

HARD DRIVE EXPANSION:

Space provided for easy additions of internal hard drives.

BUNDLED SOFTWARE:

A full selection of business software for today and tomorrow.

KEYBOARD:

Detachable IBM PC AT-style keyboard with security keylock.

The Discware Guarantee

Not only does the Kaypro PC carry 12 month warranty, but, Discware offers an unprecedented support plan.

Should your Kaypro PC malfunction during the warranty period we will either replace or repair the faulty computer on the spot. And we provide hot line support free of charge.

TOSHIBA T3100

the AT for those on the go



- CPU: 8 MHz 80286.
 RAM: 640 KB expandable internally to 2.5 MB.
 ROM: IBM AT compatible.
 DISK STORAGE: 720 KB 3.5" floppy disk drive, one 10 MB hard disk, connection for external 1.2 MB/360 KB 5.25" floppy disk drive.
 EXPANSION: Internal expansion slot.
 INPUT/OUTPUT: Serial and parallel ports.

KAYPRO 286i

the world's first AT compatible



- CPU: 8.0 MHz 80286.
 RAM: 640 KB expandable to 15 MB.
 ROM: IBM AT compatible.
 DISK STORAGE: 1.2 MB floppy disk drive, one 30 MB High Speed hard disk.
 EXPANSION: Eight expansion slots.
 INPUT/OUTPUT: 1 each serial and parallel ports.
 POWER: 185 watt power supply.

KAYPRO 386

the mean machine



- CPU: 16 MHz 80386.
 RAM: 1 MB 32 Bit wide RAM, expandable to 16 MB.
 ROM: IBM AT compatible.
 DISK STORAGE: 1.2 MB floppy disk drive, one 40 MB High Speed hard disk.
 DISK CONTROLLER: IBM AT compatible disk controller supporting up to two (2) floppy disk drives and two (2) hard disks of up to 130 MB each.
 EXPANSION: Six available expansion slots: one 32 Bit, three 16 Bit and two 8 Bit. Room for 5 half height devices.
 INPUT/OUTPUT: 1 each serial and parallel ports on the motherboard.
 POWER: 215 watt power supply.



5th Floor, 3 Smail Street, Broadway NSW 2007 Tel: (02) 212 6933

Desktop Publishing

tegrated Page Processing'. If you have a Mac, and little software for it, Ragtime might well be an 'all-in-one' solution to most of your software needs, as it pro-

vides facilities for word processing, desktop publishing, forms generation and spreadsheet work, in an integrated package.

The desktop publishing part of Ragtime includes a split-screen facility, with up to nine windows on the screen at once, so you could work with nine different parts of

ADVANCED VISION RESEARCH ADVANCED VISION RESEARCH_{INC.}

1943 Hartog Drive, San Jose, CA 95131 Phone: (408) 436-5566 FAX: (408) 436-2914

MegaFax

MegaFax enables users of Pagemaster products to both send a graphics file to remote facsimile machines, and to receive fax transmissions on their PC's for editing or for printing on the system's laser printer. MegaFax serves as an image transfer utility between Pagemaster 300 dpi graphic images and Group III fax file 200 dpi images. Combined with AVR's MegaScan Image/Text Editing software and high quality HP LaserJet compatible fonts, facsimile images of unprecedented clarity and content can be quickly composed and sent worldwide.

AVR uses GammaLink's fax modem board and software as the PC to phone line interface. By using the GammaFax high-speed PC-to-PC file transfer capability, Pagemaster users have the option of avoiding the 200 dpi resolution of Group III fax machines and transfer 300 dpi images directly between similarly equipped PC workstations at rates up to 9600 bits per second.

MegaFax Features

- *PC to Group III FAX transmission
- *FAX-to-PC reception
- *PC-to-PC communication at 9600 baud
- *Automatic 300 dpi <-> 200 dpi scaling
- *Compatible with MegaScan and AVR-300 Image Scanner
- *Mouse driven user interface



Think how useful it could be to send and receive graphics files via fax — it's now possible with the Megafax option for Pagemaster, from President.

the document simultaneously. The program allows you to add lines into your documents, and you can highlight lines of text by reversing them, to produce white text on a black background.

The word processor portion of Ragtime allows you to work in columns, with automatic text-flowing from column to column, leading (the ability to change the amount of space between lines of text), and sizing of fonts from a minimum measurement of one point (so tiny you can't read it), up to 127 point ('Second Coming' headline size) type.

Infomagic also handles a set of new Laserwriter typefaces produced by the company Image Club. These are true laser fonts (rather than bit-mapped fonts such as those which appear in MacPaint output), so they can be infinitely scaled without loss of definition. The Image Club fonts can be downloaded to the Laserwriter, or any Postscript-compatible device.



16,000 (!) pictures can be stored in a single file. To find a particular picture, you can either 'browse through' the file, picture by picture, or search for it by name or description. Part or all of a picture can then be pasted into another application. The product includes a desk accessory, so you can retrieve pictures from Picturebase without leaving your current application. A number of sample pictures are included with Picturebase.

Additional details on these are available from Infomagic.

There are, of course, many more products in the pipeline to give even more power and flexibility to the Mac working as a desktop publishing device, but this selection shows the kind of products available.

Conclusion

It's almost like the early days of personal computers, all over again. For a while, ▽

Each font family includes at least two variations, such as 'extended', 'bold', 'thin' and 'grey'. The most interesting of these fonts, in my opinion, are Paintbrush, Chrome Bumper and Brass Plate.

Finally, also from Infomagic, is the Picturebase art-management system. This allows you to arrange Macintosh clip art, MacPaint and MacDraw documents into an organised library, so you know what you have, and can get to it easily. Up to



Using third-party software, very sophisticated desktop publishing results can be produced on Hewlett-Packard's Laserjet printer.

things were getting pretty stale in the computer field. Lots of ho-hum, me-too PC clones and boring spreadsheets and word processors. Now, with desktop publishing entering its second phase, with PCs in the running and the stakes heating up all over, there's a bit of life in town — at last.

There are now a number of clear alternatives if you want to get involved with desktop publishing. If you already have part, or all, of the hardware on hand, you might decide on Pagemaker for your IBM. If you want to start from scratch, you can



follow the Macintosh or the President line, or you can modify your set-up to take advantage of Hewlett-Packard products.

It's certainly extremely interesting at the moment, and the effort being put into software and hardware for desktop publishing can only benefit the computer industry as a whole. If you do not become involved in desktop publishing, the spin-offs from the products being developed will find their way into the future computer investments you make. □

If you want a taste of desktop publishing (and a chance to appreciate some of the problems), see Tim Hartnell's DIY desktop publishing program, Newsletter Publisher, in YC, August 1986.

Magazine MICRO

Exploring The Use Of Microcomputers In Magazine Publishing
Volume One, Number 9 □ A Renegade Publication
Terry Ulick, Editor

Building A Publishing Model Part One: Planning

Last issue, we introduced you to an exciting new page makeup technology for creating pages on the Macintosh computer. We are putting such a program to use this issue, and we can't tell just what a pleasure it is to put pages together on a computer screen instead of a paste-up board!

This issue we start

building what is commonly referred to as a "publishing model." If you're not sure exactly what the term "model" means, you're not alone. We have had trouble with the term, but in our view, a model is a combination of statistics about your operation, put together in such a way as to show their relationships. From

this model, you can see how various aspects of your operation in turn affect each other, and changing variables can be altered at the bottom. With such a model, it is also possible to forecast into the future based upon the past.

Ideally, the model will allow you to



Pagemaker on the PC turns out exactly the same professional-looking results as on the Mac, with the advantage of allowing access to much cheaper laser printers.

Pagemaker on the Mac has been one of the driving forces behind desktop publishing. Version 2.0 has more than 20 new features, including the ability to work on facing pages at the same time.



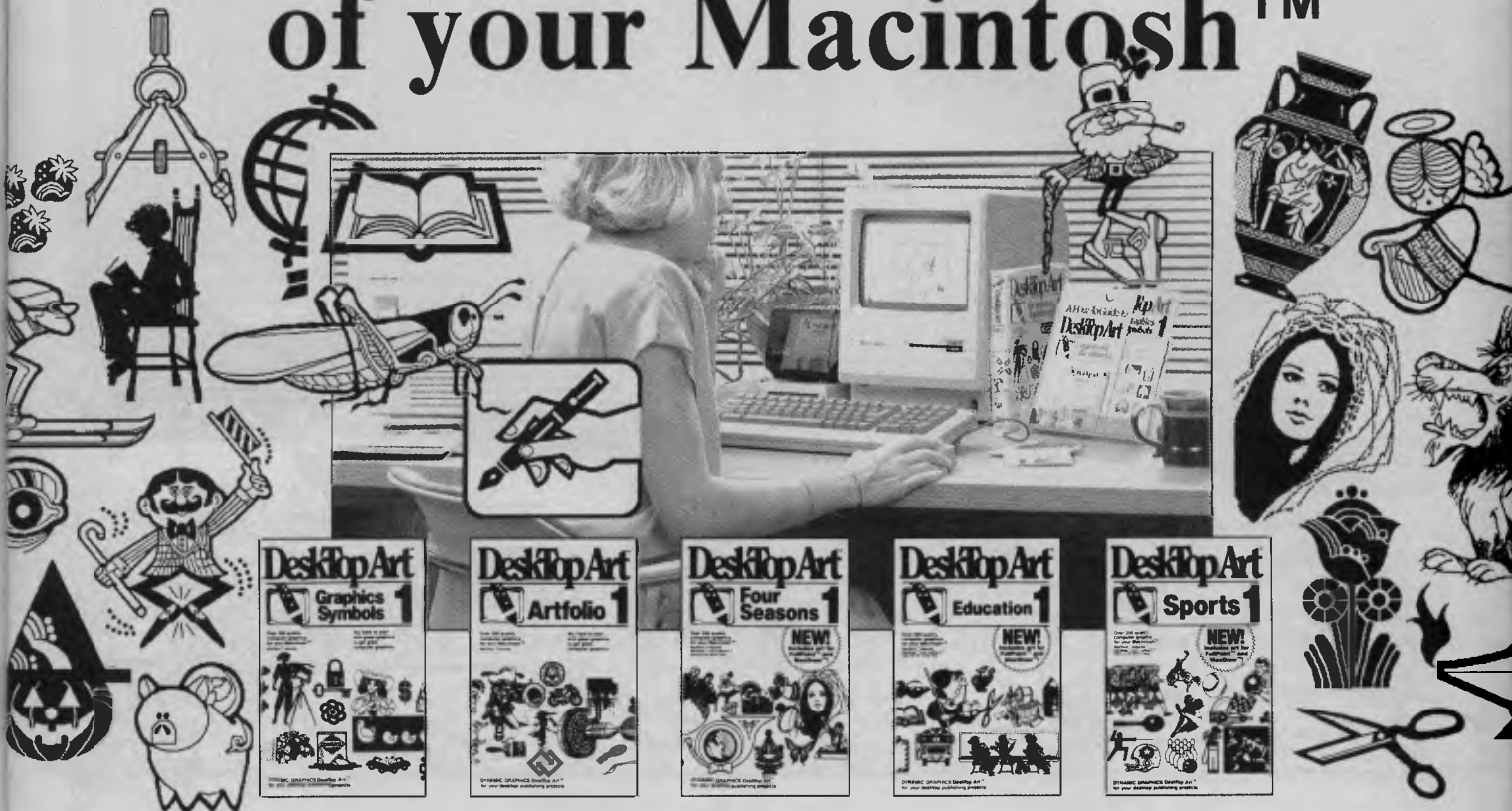
Desktop Art provides a library of hundreds of graphics, from animals to seasonal graphics to general design elements.





DeskTop Art™

quality illustrations that match the versatility of your Macintosh™



Each DeskTop Art collection has been specially compiled from Dynamic Graphics' art library of more than 20,000 professional illustrations by top commercial artists.

With DeskTop Art collections for the Macintosh, you create stand-out communications every time ... newsletters, reports, brochures, ad layouts, forms, overhead transparencies - all you desktop publishing projects will profit.

The DeskTop Art collections are compatible with Macintosh publishing programs and include 200-300 graphics stored as MacPaint™ documents. Three of the packages also include FullPaint™ and MacDraw™ graphics documents for better visual resolution.

Instruction Manual, Pictorial Index, Heavy Duty Storage Case Included. . . each DeskTop Art package includes a 24- to 26-page instruction manual, a pictorial index of the art in miniature and a clear plastic storage case that includes a built-in easel to hold your manual or index for reference while you work.

Over 1200 high quality graphics

SPORTS 1 - action graphics for all major sports and many recreational categories. More than 200 illustrations including 6 FullPaint files and 2-3 pages of MacDraw graphics. Item 09EN-816 - \$165*

EDUCATION 1 - illustrations for every level, primary grades through college. Over 200 graphics including 6 FullPaint files and 2-3 pages of MacDraw graphics. Item 09EN-820 - \$165*

FOUR SEASONS 1 - over 200 illustrations for every season and major holiday. Includes 6 FullPaint files and 2-3 pages of MacDraw graphics. Item 09EN-812 - \$165*

ARTFOLIO 1 - a potpourri of illustrations and symbols, including animals, common objects, people, occupations. More than 300 graphics stored as MacPaint documents. Item 09EN-801 - \$165*

GRAPHICS & SYMBOLS 1 - more than 300 pictograms, seasonal and nonseasonal symbols and design elements stored as MacPaint documents. Item 09EN-810 - \$165*

ORDER DESK TOP ART TODAY

Please send the Desk Top Art collection(s) indicated below, at \$165.00 each plus Sales Tax, postage and handling. Please find my cheque enclosed.

- Sport 1 (NEW!)
- Education 1 (NEW!)
- Four Seasons 1 (NEW!)
- Artfolio 1
- Graphics & Symbols 1

Attention _____

Company Name _____

Street _____

City/Suburb _____

State _____

Postcode _____

Purchase Order No. (if required) _____

Business Phone No. _____

Authorised by (signature) _____

Mail To:

Dynamic Graphics Pty Ltd
36-38 Parramatta Road, GLEBE NSW 2037
OR PHONE TOLL FREE
008 22 5319 (STD Calls)
660 0211 (Local Calls)

* Orders for Desk Top Art must include Sales Tax.



A JAPANESE STORY WITH 7000 C

KONICHIWA! Selling software in Japan is a tall order, and a task not to be lightly undertaken. Not only is the Japanese language very different from English (Aahhhghh — those 'Jinglish' manuals) but the character set is humungous. There are two primary sets of Kanji characters known as JIS 1 and JIS 2. Each defines roughly 3500 characters which are essentially Chinese in origin. The situation is further complicated by the use of two additional (but smaller) uniquely Japanese character sets, known as Katakana and Hiragana. School children begin by learning to write using the simpler 49-character Katakana syllabary. To cap it off, most Japanese technical writing includes occasional words in English.

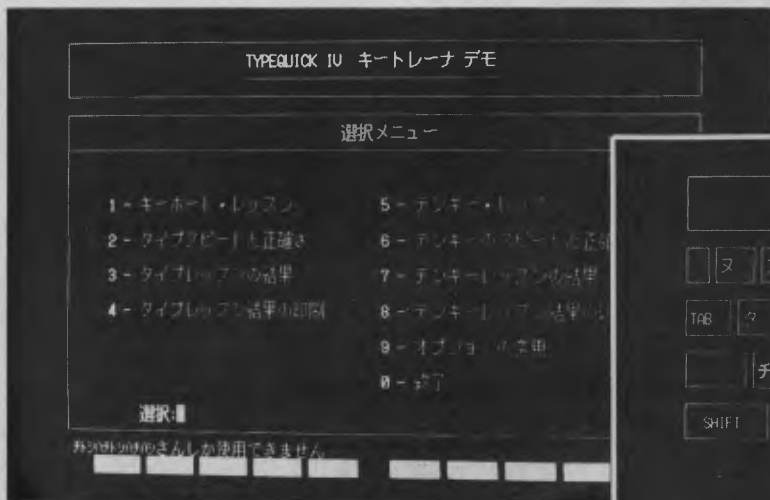
The larger computer companies (including NEC and Fujitsu) are still in the pro-

Frank Lee, himself a most honourable developer of computer programs, reports on the first Australian software product to be translated into Japanese, while Brendan Akhurst has his own perspective on the Kanjiroo and Katakoala invasion.

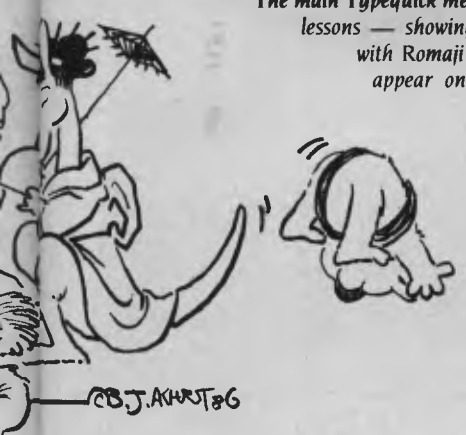
cess of defining a standard keyboard to replace the old Japanese keyboards which can take up a complete desk space.

High-res (No, Not Hi Les!)

The need to display the complex Kanji symbols is the primary reason why most computers of Japanese origin have high-resolution graphics as standard. Examples include the NEC APC series and the Panafacom Duet 16. A by-product is the very non-IBMish screen-memory layout. Programmers familiar with the NEC APC III are aware that you just don't put data into certain byte positions in the window memory. The reason lies in the origins of the APC III. It is essentially a cut-down Japanese NEC 9801 with the Kanji facility disabled. It takes only one byte to display an ASCII character, but two bytes to define



The main Typequick menu and a screen from the lessons — showing the 'qwerty' keyboard with Romaji characters — as they appear on the NEC 9801 screen.



CHARACTERS

a Kanji symbol. These symbols are so complex that even with a high-resolution monitor you can pack only 40 to a row.

It seems the most popular 16-bit PC in Japan is currently the NEC 9801. There are about 500,000 already in use (compared with only 100,000 IBM 5500s). The 9801 is based on NEC's fast equivalent of the Intel 8086, and runs at either 6 or 8 MHz. It has a very large (but not IBM-compatible) ROM BIOS, high-resolution colour graphics and provision for a Microsoft mouse. It runs a Japanese version of MS-DOS. All the utilities have their prompts translated into Japanese. The floppy disk drives can be used for either 640 Kbyte or 1.2 Mbyte formats. Be warned, however, that although it can read IBM 360 Kbyte diskettes, it cannot write to them. Transferring files from the 9801 to the IBM-PC re-

quires serial communication hardware and software. Although NEC BASIC is in ROM, it is also available under MS-DOS. Surprisingly, the ROM BASIC cannot handle MS-DOS formatted diskettes!

The upshot of all this is that there is not much of a market for straight IBM PC-type software in Japan. Not, that is, unless one is prepared to put in a great deal of effort into what amounts to a complete re-write.

Typequick — Work Faster

Hats off, then, to Sydney-based Typequick, and to its managing director Noel McIntosh for beating the odds and landing a lucrative contract with Japan Management Consultants (JMC) in Tokyo earlier this year. Having purchased a 9801 to use as the target machine, the staff at Typequick battled through (real) Japanese technical manuals (no English translations exist) and created Japanese equivalents — formulated to teach either Romaji or Katakana — of their highly successful typing tutor program. Readers may recall that Typequick topped our 1985 Personal Computer Of The Year in the Australian software segment (and was originally reviewed in our May, 1984, issue). It was also the first Australian software package to be marketed by IBM under its own logo. IBM Japan has also signed a contract with Typequick and will distribute the copyrighted Japanese version for the IX and IBM 5500 series of personal computers.

Prior to the Japanese conversion, Type-

quick made extensive sales in the English-speaking world. Over 3000 students have improved their typing skills in the United States, and users include the Ford Motor Company, Hewlett Packard, BMW North America and Boeing Computer Services.

Our standard (QWERTY) keyboard is also used on the great majority of Japanese computers and electronic typewriters ('Wapros'). To enter a Kanji word, one types the phonetic equivalent in 'Romaji' (from 'Roman plus Kanji'). A software front-end processor throws up a menu of all the Kanji equivalents which sound the same. The user then selects from that menu. This front-end processor has been tacked on to Wordstar 2000. It uses an enormous dictionary (around 180 Kbytes) to do the conversion. The computer generally provides the Kanji symbols in ROM. The JIS 2 set is usually optional.

This means that the Japanese have to learn to type on a standard keyboard, all of which adds up to a major market for Typequick's new baby. Given the current Australian yen for the Yen, software exporting is more than ever an attractive proposition. The Yen has multiplied (in Australian terms) by a factor of four in as many years. McIntosh says that about one million Japanese (mainly women) are trained in keyboard skills each year. This demand should perpetuate, since it is traditional for Japanese women to leave

Sit down,
take a deep breath,
and relax!

Your Computer has
just taken the hassle
out of buying a
computer —



- ★ All Top Brands Reviewed
- ★ IBM's AT & JX, AT clones
 - ★ Commodore Amiga
 - ★ Latest Microbees
 - ★ Portables
 - ★ Games Machines
 - ★ Best Buys!

Available at your Newsagent
now!

Or simply send \$4.50 plus \$1.50 post
and packing to The Federal Publishing
Co, PO Box 227, Waterloo 2017 NSW.

Soft-Sell in Japan



Typequick used the NEC 9801 to develop their Japanese version of the tutorial — the high resolution monitor is a necessity, and it happens to be the most popular PC in Japan.

the workforce at about age 28.

JMC anticipates sales in the order of \$A8 million over the next three years. With a staff of 450, JMC has an annual turnover of \$A20 million.

Typequick claims that approximately \$A105,000 went into the task of translating the product and introducing it into the Japanese market. Some of this was offset by assistance from the New South Wales Government's Department of Industrial Development and Decentralisation.

It's Not Enough to Do as the Romans Do

To break into the Japanese market one needs to have the services of people who already know Japan. In this case, the 'vector' was the Sydney-based company Dynapacific and its counterpart in Tokyo, Data Pacific (Japan). These two companies jointly organised meetings with prospec-

tive buyers, resulting in the eventual contract with JMC.

Dynapacific has invested in a NEC 9801 and intends to offer assistance to companies considering taking the yellow brick road to Tokyo. The managing director Graeme Bruce speaks fluent Japanese and provides translation and interpretation for clients who need to front up to non-English speaking Japanese.

Perhaps your software product is right for Japan. Conversion to Japanese will probably cost you more than the original developmental outlay, but there is a very large market overseas — (and overseas sales don't attract sales tax). Come on all you software developers, let's get this country's deficit back where it belongs. Besides, it's a great excuse to sample the culinary delights of Tokyo — one of the world's greatest restaurants. (Of course, you won't be able to afford it — but it sure looks good.) □

\$275 SOFTWARE & 300/1200 MODEM PACKAGE FOR ALL PC/MS-DOS COMPUTERS!

Full
VIATEL
support

Announcing the All-Australian
HYPEC ELECTRONICS 300/1200
MODEM Comms Package!

Never before such a Value-for-Money offer: Here's what you get for just \$275:

HYPEC 300/1200 BPS MODEM:

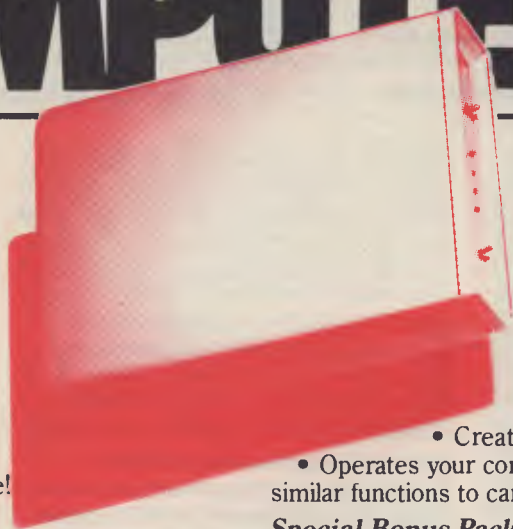
- Designed and manufactured in Australia to suit local communications standards.
 - Optional HYPEC AutoDialer Accessory available!
 - Suits any computer with RS232 Interface!
 - Connects to Viatel at 1200/75 BPS!
 - Dials up Bulletin Boards at 300 BPS Full Duplex!
 - Goes on-line to Databases and remote Mainframes!
- Telemcom Approval pending.

PLUS

Australia's own feature-packed COMMUNICATIONS SOFTWARE PROGRAMME! **SuperCom II FREE OF COST!** Yes! Normally \$175 - it's FREE with your **HYPEC Modem Package!**

SuperCom II, Australia's own highly-acclaimed Communications Software Programme:

- Provides full support for the Viatel Videotext system, in addition to all on-line databases and mainframe computers!



- Emulates all popular terminals!
- Automatic Log-on!
- Saves and replays frames, including Viatel!
- Sends and Receives to mainframes!
- Captures dial-up sessions to disk!
- Sets-up advanced dialling directories and batch command files!
- Uses Modem 7 & YAM batch transfer protocols!
- Creates & Edits custom terminal emulations!
- Operates your computer remotely in photostat mode, with similar functions to carbon copy*!

Special Bonus Package Offer! HYPEC Automatic Dial-Up Answer Unit just \$50 with every HYPEC Modem sold!

You just won't beat this fantastic offer on communications equipment anywhere else. So call us on the HYPEC Hotline, and BUY AUSTRALIAN-MADE! *Registered trade name.

HYPEC ELECTRONICS PTY LTD
21 Ryedale Rd, West Ryde, Sydney NSW Australia 2114.
Tel: (02) 808 3666. Fax: 808 3596. Cable: LAMRON SYDNEY. Telex: AA71551 LAMRON.
TELEPHONE ORDER HOTLINE: (02) 808 3666.

Bank cheque, money order, Visa, Bankcard & MasterCard accepted.

HYPEC
ELECTRONICS

THE ADVERTISING AGENCY: HYPEC.7

CHOOSING A FEW OF OUR FAVOURITE Cs

Regular readers have doubtless been following Les Bell's series, 'C for Smarties', and wondering which C compiler they should buy. Les and his team have set out to answer the question in a comprehensive evaluation of a number of C compilers and interpreters.



WITH THE WIDESPREAD adoption of the C programming language as the standard for PC software development (it must be the C-son) there is growing interest in the rapidly increasing number of C compilers available, and in their associated tools: function libraries, debuggers, editors and the like.

In this first of an occasional series of reviews of programmer's tools, we seek out at a number of C compilers, giving objective assessments of performance, together with product descriptions which we hope will assist programmers in selecting an appropriate tool for their needs.

Before starting to examine the compilers, we need to establish just what we are looking for, see? In other words, just what makes a good C compiler?

We can identify a number of characteristics which distinguish the various C compilers on the market. These are:

■ Reliability

Professional programmers, in particular, need to be sure that when a bug emerges in their code, they put it there — not the

compiler. To professional programmers, time is money, and they cannot afford to waste time debugging the compiler when they should be debugging their own code. All other characteristics are irrelevant if this cannot be satisfied. Reliability is also important to the beginner programmer, who is discouraged by the appearance of bugs. Hackers alone may be willing to trade off reliability for cost (hackers are notoriously short of money for software).

■ Support from Third-Party Vendors

The emergence of suppliers of pre-compiled function libraries for PC compilers has encouraged programmers to sweeten up their products with the inclusion of windows, mouse-driven menus, communications functions and the like. If you want your programs to look good, you'll have to use some of these libraries. Other libraries support B+-Tree file access, screen forms and other functions essential to business software.

Compilers which are not supported by these third-party products are obviously of less utility. Similarly, programmers may be dependent on sophisticated debugging

tools. While programmer of the old school (like me) may view such new-fangled gizmos with scorn (we paid our dues, debugging the hard way, and don't see why these youngsters should have it easy!) there's no doubt that when you're in a hole, some of these split-screen, debuggers, which can simultaneously display source and object code, can pay for themselves in minutes. The same applies to profilers, which tell you which parts of your code are executed most frequently and should therefore have the most optimisation attention paid to them.

■ Run-time Performance

Speaking of which, a slow program is undoubtedly less appealing than a fast, responsive one. Compilers which generate slow code — all other factors being equal — are of less interest than those that generate fast code. Hence our interest in benchmark performance.

■ Small Code Size

Likewise, code size is important, not so much to the beginner, but definitely to the programmer working on large projects. It doesn't really matter whether a program

The Great C Comparo

comes out at 16 Kbytes or 12, but it certainly does make a difference whether it comes out at 640 or 512 Kbytes! Incidentally, this is why Ashton-Tate had to switch C compilers between dBase III and III Plus — on the older compiler, III Plus was coming out at over 640 Kbytes, which just won't fit into the memory of the PC.

■ Compile Speed

This is more important to beginners and hackers than to professional programmers. Beginners tend to have to recompile programs frequently as they discover bugs; the professional is more inclined to the view that the program is ultimately compiled once but run millions of times, and that therefore run-time performance is more important.

■ Memory Models Supported (for 8086/88)

The 8086/8088/80286 processor family uses what is termed a segmented architecture. This breaks memory up into 64 Kbyte chunks called segments, and there are various ways of combining segments into a program. The simplest, called '8080 model', simply places all code and data into a single segment; this limits the size of the program and its data.

More commonly used is 'small model', in which the code and data are separated into two segments. This allows larger programs at virtually no cost in terms of speed or complexity.

The next refinement is to allow multiple segments for either code or data or both. Now, to access widely separated data items, the processor's segment registers must be reloaded, which slows the machine, and of course pointers must now be 32-bit values rather than 16 bits in size, using up more memory.

Different compilers have different ways of coping with this situation, but, of course, it is important for large programs that it be dealt with somehow.

■ Conformance to Standard and Portability

One of the major benefits of the C language is its portability — the ability to move programs between machines, operating systems and compilers. As soon as you start to use non-standard features of a compiler, you are severely restricting the portability of your code. Admittedly, you can make use of the C preprocessor to assist, but, in general, programmers find it harder to switch between dialects of the same language than to switch between totally different languages.

Adherence to a standard ensures that code written to those standards will com-

Beginners tend to have to recompile programs frequently as they discover bugs; the professional is more inclined to the view that the program is ultimately compiled once but run millions of times, and that therefore run-time performance is more important.

pile correctly first time, that programming skills can be transferred, that function libraries will port correctly and that code you write will have a long life on different systems.

■ Comprehensive, Usable Documentation

This almost goes without saying. The more documentation you have, the better. It should be well organised, indexed, with sections describing the compiler options, associated utilities such as librarians, and the function library. Non-standard functions, in particular, should be thoroughly documented with examples, and something I would like to see is a definition of exactly in what way non-standard functions are non-standard and what the Unix equivalents are.

In fact, programmers' needs vary as they progress through different stages of using a language. Beginners need a compiler that is fast, simple, unsurprising, and are generally less concerned about speed and compactness of generated code. They need good-quality documentation, ideally with a tutorial orientation, and the ability to compile at least a good selection of introductory tutorial programs.

The hacker needs a compiler that is ideally fast, generates fast and compact code, isn't too laden with options, and has the ability to compile standard code as well as a wide selection of public domain code.

The professional programmer needs a compiler that is above all reliable, has a wide range of options to generate code for different memory models, can link to an assembler, has strong support from suppliers of libraries and support tools, gen-

erates tight code and is well documented. The professional is generally willing to pay for it.

What Does ANSI Mean?

The proposed ANSI standard X3J11 for the C programming language incorporates a number of advances and new features. Unlike some earlier language standards (for example, ISO Pascal) this one adds features and does not constitute a subset of all practical compilers, and in practice many compilers are starting to support the ANSI standard extensions, such as function prototyping.

Methodology

An evaluation of several C compilers is an ▷

What is a Compiler?

GOOD QUESTION! Computers actually execute internally stored programs in a code called object code, which comprises simple instructions to move the contents of memory around and process it in excruciatingly simple ways. When I say excruciatingly, I mean excruciatingly — even simple tasks like comparing two words can require pedantic execution of hundreds of instructions.

We can write instructions into the computer in their binary patterns, but these patterns do not make much sense to humans, and so we more often use a code called assembly language, in which each instruction is represented by a three- or four-letter (or so) mnemonic, such as MOV (move), STO (store) or whatever. This helps a bit, but there has to be an easier way.

There is, in the form of so-called high-level languages. C is a high-level language, in that a single statement of C corresponds to multiple — as many as several hundred — object-code instructions. It is well known that it takes the same time to write 10 lines of code, regardless of the level of the language, so programmers are able to write much larger and more complex programs in high-level languages.

The high-level language cannot be executed directly by the processor, and so must be translated by some other program. This program is the compiler, which reads the original C programs and writes out files of object code which perform the same functions. In practice, the compiler outputs the object code in a special intermediate format called an object (.OBJ) file, which can be combined with other .OBJ files by the linker program, to generate the final program in an EXE file. □

Accounting for **IBM**[®] (OR COMPATIBLE) & **Apple**[®]

QUALITY SOFTWARE
FOR MUCH LESS THAN
YOU'D EXPECT TO PAY.

MacOneWrite

Familiar one-write peg board accounting package for the Macintosh. Easy to install and use. 3 modules: Cash Disbursements, Accounts Receivable, General Ledger System or stand alone application.



R.R.P. PER MODULE **\$295***

BusinessWorks

A full-featured accounting system providing reports, help messages, show windows. For Apple IIC and IIE 4 modules including General Ledger, Accounts Payable, Accounts Receivable, Inventory Control.



R.R.P. PER MODULE **\$395***

C.P.A. PLUS

The accounting system for Lotus 1.2.3. Fully featured. Fully integrated. General Ledger, Accounts Payable, Accounts Receivable plus graphs and forecasting. Custom designed reports.



R.R.P. **\$495***

PRIVATE LABEL SYSTEM 4

Fully integrated accounting system. Accounts Receivable, Payable, General Ledger, Invoicing. "Step by step" documentation, "Help" feature and test files.



R.R.P. **\$495***

CASH DESK

A powerful Cash Book/General Ledger. Links to most popular spreadsheet programs. Trial balances, bank reconciliations, etc.



R.R.P. **\$725***

ASSET MANAGER

A professional accounting tool to keep asset registers up to date. Handles compound assets, multiple companies, flexible depreciation, etc.



R.R.P. **\$995**

DISTRIBUTED BY:



IBM, IBM PC/XT are trademarks of International Business Machines Corp. Apple II/III/IIc are trademarks of Apple Computer Inc.

*Exc. Sales Tax

33/8-24 KIPPAX STREET SURRY HILLS 2010

FOR FURTHER INFORMATION CALL:

SYDNEY (02) 211 1266

MELBOURNE (03) 553 0016

BRISBANE (07) 341 5088

The MIX C compiler is conspicuous in this crowd because of its low price — at \$79.95 it is the cheapest by a considerable margin. Accompanied by a large (roughly 450-page) tutorial manual, this product is clearly aimed at the beginning C programmer.

ambitious undertaking. Having ascertained what constitutes a good C compiler, one must then design appropriate benchmark tests and investigative techniques for comparing the compilers. Then, of course, any of the compilers may be negatively affected by poor performance in an area not specifically being investigated (sigh!).

Microsoft C Version 4.0

MICROSOFT HAS, of course, a longer track record than any other company in supplying software development tools for microcomputers. This company has introduced a number of high-level language interpreters and compilers, ranging from BASIC through FORTRAN, COBOL and Pascal to C. Until last year, Microsoft had not released its own C compiler, but instead supplied the Lattice compiler under a marketing agreement with that company. However, Microsoft had for some time been developing and using its own compiler inhouse.

Last year, the compiler was released as Microsoft C Version 3.00. Recently, Version 4.00 was released, which takes the development even further. The documentation is very comprehensive; three folders contain four volumes — a User's Guide, Microsoft Codeview Manual, C Language Reference Manual and a Run-Time Library Reference Manual. These stacks of paper are well organised and complete.

Microsoft C boasts an unusually extensive function library, which closely conforms to the Unix/Xenix 'standard', as well

as closely conforming to the proposed ANSI standard for the C programming language. In fact, the MS-DOS compiler shares a common run-time library with the Xenix C compiler.

The Microsoft compiler supports more memory models than any of the others reviewed: small, compact, medium, large and huge. These are defined as follows:

small model: one (up to) 64 Kbyte segment for code and one segment for data;

compact model: one segment for code and multiple data segments;

medium model: a single data segment and multiple code segments;

large model: multiple code and multiple data segments; and

huge model: as for large, but with no restrictions on array sizes.

These models are simply default ways of declaring different kinds of pointers. Microsoft C supports three kinds of pointers: near pointers, far pointers and huge pointers. Near pointers are simply 16-bit values, often interchangeable with integers (though this is obviously implementation-dependent); while far pointers are 32-bit entities which comprise a segment value and an offset value, both 16 bits each. Address arithmetic (and this applies to most compilers) is performed on the offset value only, on the assumption that comparisons and subtractions are only performed on pointers to related objects in the same data segment. While this is adequate for most purposes, it does impose a limitation on array sizes.

The huge pointer type is the same size as a far pointer, but pointer arithmetic on huge pointers is carried out on all 32 bits, thus allowing data items which are referenced by huge pointers to span more than one segment (though there are some restrictions in the interests of efficiency).

Apart from extensions such as these, the Microsoft C compiler adheres very closely to the proposed ANSI standard for the language. It supports such advanced features as structure assignment, the void type, enumerated types, and function prototyping in forward-reference declarations of functions. While some facilities are not implemented, such as the const and volatile storage classes, the corresponding keywords are reserved. In addition, the manual describes the size of an int as 16 bits on the 8086/80286, but 32 bits on the 80386 and 68000, indicating the likelihood of future versions of the

The Great C Comparo

compiler for those processors.

As you might expect, the Microsoft C compiler provides comprehensive support for DOS functions — for example, network file sharing with record locking, subdirectory manipulation and access to environment variables. Support for PC hardware is minimal; presumably third-party vendors will take the opportunity to supply libraries for this purpose.

8087 support is comprehensive: the compiler comes with a library which emulates the 8087, and can be linked with this to sense the presence of an 8087 and either use it or call the emulation routines. Alternatively, the compiler can generate in-line code for the 8087/80287, for optimum performance, but such code will not run on machines which do not have the maths chip.

The compiler features two control programs: MSC.EXE, which uses the same syntax as other Microsoft compilers, and CL.EXE, which is compatible with the compiler controller for the Xenix version of this compiler. The major difference between the two is that CL can automatically invoke the linker. Three utilities are provided to further customise systems using code generated by the compiler. EXE-PACK.EXE compresses sequences of identical characters and optimises the relocation table of .EXE files, making them smaller and faster to load. EXEMOD.EXE allows the programmer to edit the contents of the .EXE file header, to allocate more stack space, change the allocation values and so on. Finally, SETENV.EXE allows the user to increase the size of the environment area allocated by COMMAND.COM in DOS 3.1 and earlier.

One of the most attractive features of the Microsoft C compiler is the Codeview debugger; this is an interactive source-level debugger, which uses windows to display the source code, command interaction and trace values. When used with the Microsoft Mouse, the Codeview debugger is particularly convenient and powerful. Multiple breakpoints can be set with just a mouse click, and variables can be watched. The display can show a disassembled listing with interleaved source code if required, and the processor registers can be displayed. Intelligent use of the Colour Graphics Adapter allows debugger display in one window while graphics output is placed in another.

All in all, the Microsoft C compiler is a very impressive product, and a good

choice for the professional programmer working with these IBM PC or other MS-DOS systems.

Computer Innovations Optimising C86 V 2.30a

Computer Innovations was one of the early entrants to the 16-bit C-compiler market, with versions of its compiler for both MS-DOS and CP/M-86. The compiler is therefore a mature and stable product, which has evolved gradually to provide a good general set of facilities.

CI-C86 comes with 10 libraries for the PC. Two of these are small- and big-model libraries of IBM PC-specific functions; the remaining eight libraries offer combinations of big/small model, pre-DOS 2.0/DOS 2.0 and later, and software/8087 floating point code.

The IBM PC-specific functions are a handy bonus, including routines for access to the RS232 ports, the printer ports, keyboard and screen handling routines, including graphics.

This is not a small compiler, particularly with 10 libraries. Consequently, it is supplied as a collection of squeezed files on five floppy disks, making installation just a little bit more complex than simply copying the files onto a hard disk. Fortunately, a batch file simplifies the process.

Generated code is reliable and bug-free; whenever I've had problems, I've found the solution to lie in my code and not the compiler.

Bit fields are supported, but not the void type, nor structure assignment, nor enumerated types. These are not currently major deficiencies, since few programs make use of them. This can be expected to change with the increased adoption of ANSI features in other compilers.

Performance is quite acceptable; the new version 3.0 compiler (due for release real soon now) is said to be significantly faster.

The documentation consists of a single manual, which covers the various programs which make up the system: the four passes of the compiler, the librarian and archivist utilities, plus the different libraries for the compiler.

All functions are extensively documented with example programs, and this is further reinforced with some applications notes which illustrate topics like programming the serial ports on the PC, accessing BIOS routines and driving ANSISYS.

I purchased two copies of this compiler directly from CI in New Jersey, and found

LINEA-MAIL

NOT just another Mailing Labels system.

NOT just another Mailing List manager.

LINEA-MAIL can:

1. Manage multiple Mailing Lists and multiple Letter Files.
2. Create Standard or One-off Letters, or use pre-printed stationery.
3. Select or search by any Mailing List field, by number range, by Category. (Ideal for generating special lists of clients, members, prospects).
4. Sort by Postcode for bulk mail.
5. Produce Telephone Lists and Name and Address Lists.
6. Print Mailing Labels 1 to 4 across.
7. Produce selected Summary Lists, including a mailing run summary.
8. Has a Notepad area for each Mailing List entry, for any useful information for later browsing or printing.
9. Edit letters on-the-fly as you print them, to enter individual amounts or special messages.

★ Many more useful features to improve your business efficiency.

★ No need for a separate text-editor or word-processor.

★ **Easy to use**, even if you are not a computer whiz! Menus and prompting messages to guide you at all times.

★ Comprehensive 60 page manual.

★ **Value for money**, why pay \$300 or \$400 when LINEA-MAIL does the job for less.

★ For IBM PC/XT/AT or compatibles.

PRICE: \$80.00 (plus \$16 Sales Tax)
(Money-back Guarantee)

Send to:
FREEPOST 7
LINEA COMPUTING CONSULTANTS P/L
P.O. BOX 131
HAWKER A.C.T. 2614

Please send _____ copies of LINEA-MAIL.

Please send me a demo version. _____ (\$5.00)

I enclose \$ _____ (Cheque/Money Order)

Name: _____

Company: _____

Address: _____

Phone: _____ Computer: _____

The Great C Comparo

the company to be very friendly and helpful to deal with, and offering good support (not that we've needed it).

Incidentally, users of this compiler should be aware of a book called *Systems Software Tools* by Ted J. Biggerstaff, published by Prentice-Hall. This book, which teaches the principles and practice of systems software design, contains source code for a terminal emulator program and a windowing, multi-tasking operating environment for the IBM PC. A disk containing the source code will be available shortly — and of course, it's all for CI C86.

I believe one of the early versions of this compiler has been placed in the public domain, which would certainly make it a great bargain. And meanwhile, by the time you read this, there should be another new-improved version of CI C86, called C86+, on the market.

DeSmet C

HERE'S A COMPILER to conjure with: high performance in a well-thought-out package, at a low cost. DeSmet C is, to the 16-bit CP/M-86 and MS-DOS world, what BDS C was (is?) to the 8-bit CP/M-80 user. That is, it offers adequately high performance, reliability and full functionality, at a price attractive to hackers, and is good enough for a lot of quick and dirty and small systems work.

DeSmet C, from CWare, is supplied on four disks, which contain a comprehensive collection of software and utilities. Apart from the compiler itself, which operates in two passes (parser and code generator), there is also an assembler (which doubles as pass three of the compiler), a linker (called BIND), libraries and various header files. So far, all is as expected — but the fun has barely begun!

Also supplied on the disks are a full-screen editor, librarian, symbolic source code debugger, profiler, VDISK program, source-code comparator program, and various utilities and example programs. These are no lightweight utilities, either, as a brief experiment will show.

The compiler is a fairly straightforward affair, lacking the support for ANSI features which more expensive products boast. Such features include structure assignment, enumerated types and bit fields. I have mixed feelings about this: if this older dialect of the C language was good enough to write the Unix operating system in, then it ought to be good enough for most of us. Certainly, I've managed without such 'fancy' additions for a

long time now — but I suspect my code might look better if I did use them.

The DeSmet compiler supports only small memory model — that is, one code segment and one data segment. This is adequate for many applications; and for applications which require more code, DeSmet provides one work-around in the form of an overlay manager which will allow the programmer to place multiple overlays into the .EXE file and load them as required. This is good for small-memory systems also (remember them?). Alternatively, the overlays can be permanently loaded into memory, for greatest speed.

The output of the DeSmet compiler is a .O file in a proprietary object format. Actually, the output of the compiler is assembler, which is passed to the assembler directly, and it is the assembler which produces the .O file. This means it is possible for the programmer to insert assembly source in the C program source file, preceded by the #asm 'preprocessor directive'. The assembler is fairly plain vanilla, with no support for macros, codemacros or any of the other goodies to be found in MASM. On the other hand, the only use for this assembler is to write very short routines to perform functions like accessing the IBM PC ROM BIOS.

The compiler provides good support for DOS functions like chain(), exec() and others, and also has functions for IBM PC scree and keyboard access.

The editor, 'see', is quite powerful and easy to customise for non-IBM hardware, since the source code for the screen driver component is supplied in source code form, and can be bound to the object version of see provided. Other utilities (such as the debugger) use the same screen driver. See has quite adequate facilities, including the ability to create macros, to auto-indent and even to automatically auto-indent following a { character.

Two libraries are provided, one with software floating point support and one with 8087 code. It was not clear from my (admittedly brief) reading of the documentation whether the 8087 code is inline, or whether it uses subroutine calls.

The debugger is a source-code type which operates in the same way as see, with a Lotus-style menu across the top of the screen. The compiler and linker can include symbol-table information in the generated code, which is picked up by the D88 debugger to allow display of source

code, values of variables and expressions, including arrays and structures. Screen flipping (from debugger to program output) is supported on the IBM PC and similar machines (source code for the driver is supplied).

The profiler is quite a neat idea; triggered by the system clock, it simply collects the current value of the program counter and increments the count in one of 1024 buckets which produce the performance histogram.

Documentation for this compiler is on the flimsy side, but is nonetheless fairly complete, extending even to a description of the 8086 and 8087 instruction sets.

The benchmark timings reveal that the DeSmet compiler is no slouch, being just behind the Microsoft compiler in performance, at a considerably lower price.

A particularly attractive 'feature' of the DeSmet package is the way in which it has started to attract public domain support. A brief look through the libraries of the C Users Group, for example, reveals that the majority of recently contributed programs were written using this compiler.

Eco-C

JACK PERDUN IS best known for his books on C programming for Que Corporation, but he is also active as a software developer with his company, EcoSoft. A strong and vocal believer in the future of the C programming language, Purdum has set about developing an up-to-date, powerful compiler at a low price. The result is Eco-C, a low-cost yet powerful and up-to-date compiler (!).

The compiler is supplied on two disks, and is simply and easily installed on either a floppy-only system or on a hard disk system by running the appropriate batch files (two versions of the compiler's manager are supplied).

Like other low-cost compilers, Eco-C supports only the small model (64 Kbyte code, 64 Kbyte data). However, it supports the construction of files in memory, allowing access to large data sets. Unfortunately, memory-resident overlay code (*a la* DeSmet) is not supported.

The compiler comprises six files, which install themselves in your hard disk BIN subdirectory; this suggests Eco-C is a multi-pass compiler, though I doubt it makes six passes through the code. The various passes are managed by a program called CC.EXE, written by Chris DeVoney of Que Corporation. This automatically opens the appropriate files in the appro-

priate subdirectories, and also automatically invokes the MS-DOS link program.

CC.EXE is moderately smart, and includes a 'MAKE' option, loosely modelled on the UNIX MAKE utility, and which examines the date and time stamps on the various source and object files and only recompiles those files which have been updated since the last compile. A nice feature, not too difficult to implement, and very useful in large projects. The source code for CC.C is provided, so the system can be extensively modified.

Floating-point support uses the IEEE format, and will use an 8087 co-processor if one is available; a compiler variable called 8087 indicates the presence of the floating-point chip.

Eco-C does not support some features of Unix V7 (K&R) C, most notably bit fields. On the other hand, it does provide support for some of the proposed ANSI X3J11 C features, such as the void function type (for functions which do not return a value), function prototyping, and structure assignment and function returns.

The compiler is supplied with a comprehensive library of over 200 functions, which are for the most part modelled on the Unix System V libraries, with some from the Berkeley versions of Unix. In addition, there are hardware access functions for IBM PC screen manipulation using hardware functions, as well as other useful functions such as -

```
int soundex(s)
```

```
char *s;
```

which calculates the soundex code for a string.

The compiler provides good performance, as the benchmarks show, and is good value at the price.

MIX C Compiler V 2.0.2

THE MIX C COMPILER is conspicuous in this crowd because of its low price — at \$89.95 it is the cheapest by a considerable margin. Accompanied by a large (roughly 450-page) tutorial manual, this one is clearly aimed at the beginning C programmer.

MIX C is available for both the CP/M-80 and MS-DOS operating systems, and despite the constraints placed on its designers in running on both those operating systems, it is a full implementation of the C language as described in K & R. In fact, it is a superset: it supports enumerated types, structure assignment, and other advanced features which K & R warned were coming but are only now finding their way into the ANSI standard for C.



The compiler comprises a single program, apparently single pass, though it's hard to be sure, with a matching linker. The compiler produces a source code listing on the screen as it works, which slows it down a little, as the benchmark timings show. However, this is useful for the beginning programmer, as any errors are displayed in context with error numbers and an arrow to the offending character in the erroneous statement. Unfortunately, explanations of the error numbers are not printed until the end of the listing, but many will be obvious in any case.

The output of the compiler is a .MIX file which contains relocatable object code.

This is passed to the linker, which links it with the standard library to generate a .COM file (this is unusual; most compilers use the Microsoft linker and produce .EXE files). This does mean programs are restricted to 64 Kbytes of combined code and data, but that is unlikely to affect beginning programmers.

The resulting code is far from blindingly fast, as the benchmarks table shows, although compile times are competitive. An optional optimisation program can be passed over the object .MIX file to produce worthwhile improvements in performance at minimal cost in file size (see table). The sieve benchmark, for example, ▷

The Great C Comparo

improves from 2008 seconds to 164 seconds! I don't know what SPEEDUP.COM is doing, but it must be doing something right!

A similar optimiser called SHRINK.COM will provide space improvements. Alternatively, the run-time code can be omitted from the generated .COM file, to make it even smaller; however, it must then be loaded at run-time from the RUNTIME.OVY file.

The package provides an unusual way of managing the standard function library; rather than providing a librarian, a program is used to convert the library into an ASCII file which can be edited and appended to. It can then be re-converted back into its binary form — ingenious, not too much trouble, and quite appropriate.

The documentation is nothing if not comprehensive. At 450 pages, it is a lot more than one expects with an inexpensive compiler. An initial section introduces the user to the compiler and linker through a sample program, and this is fol-

lowed by the biggest section of the book, a tutorial on C programming. Then comes the reference section, which is not all that well organised for reference (it seems to follow a format similar to the tutorial), and finally a reference section on the compiler and linker options and utilities.

At the price, this is a class act, and compares favourably with compilers at five to 10 times the price. However, I would have to suggest that this compiler is not suitable for full-scale production work; it does not generate as fast code as the leaders, nor is it as well supported with function libraries and other add-ons, or do the compiler and linker have as many options and features (big and other model support, 80286 support, and so on).

Hi-Tech C Compiler Version 3.02
IT IS ALWAYS nice to be able to point to local products which are on a competitive level to the internationally marketed United States products which dominate our computer scene. Over the years, a number of products have shown Austra-

lian software to be up to world standards: the Zardax word processor, Typequick typing tutor, and other products, have all succeeded in world markets.

In the Hi-Tech C Compiler, Australian Clyde Smith-Stubbs has done it again. This compiler has been around for a couple of years now, with versions for CP/M-80, CP/M-86 and MS-DOS/PC-DOS. For Australian users, the advantages of local support direct from the author are obvious.

The compiler is supplied on two disks, with an installation program which places the files in a subdirectory with the compiler manager program in the root directory of the fixed disk. Operation on a floppy-only system is possible, and doesn't seem to painful; the only problem we found was that the installation program did not edit our AUTOEXEC.BAT file correctly. No matter, I never trust these programs anyway.

The compiler is actually implemented as four passes, plus a separate link stage, followed by an .EXE file-generation stage. ▶

TULLY COMPU-PRINT

For all your Computer and Office Stationery Requirements

COMPUTER PAPER, LABELS & BINDERS

11*9.5" — 70 GSM KEEN EDGE
WORD PROC. PAPER.

PACK OF 750 \$25.00
CARTON 2500 \$45.50

A4 WORD PROC. PAPER
70 GSM KEEN EDGE

PACK OF 500 \$30.00
CARTON 2500 \$60.00

11 * 15 PLAIN OR B.H.S.
70 GSM — LASER BOND.

CARTON 2500 \$48.50

COMPUTER ADDRESS LABELS * 2500

102 * 36 \$34.50
89 * 23 \$21.00

COLOURED COMPUTER BINDERS

11 * 9.5 \$3.00
11 * 15 \$3.00

PLEASE NOTE ALL PRODUCTS
ARE ABLE TO BE ORDERED
ON VIATEL

5 1/4" FLOPPY DISKETTE STORAGE

- * HIGH IMPACT AND SMOKED PLASTIC LID.
- * HOLDS 80 TO 100 5 1/4" DISKS.
- * LOCKABLE AND HINGED LID.

anti-static
\$18'00



5 1/4" FLOPPY DISKS

Single sided/double density disks \$1.90 ea.
Double sided/double density disks \$2.40 ea.

RIBBONS FOR EPSON PRINTERS

LQ-1500 \$12.50
MX/RX/FX 100 \$14.50
MX/RX/FX 80 \$ 9.50
LX/GX 80 \$ 9.50

If you buy 100 disks at a time, we will give you a free 100 capacity disk box



PHONE ORDERS
HOT LINE
(07) 379 5100

ENQUIRIES
(07) 379 5218

REVERSE CHARGES ACCEPTED



Open: — 7am-7pm Mon-Sat
SEND MAIL ORDERS & CORRESPONDENCE TO

TULLY COMPU-PRINT
P.O. Box 20,
Graceville East, Qld. 4075.

PLEASE SEND ME THE FOLLOWING ITEMS OVERNIGHT BY KWIKASAIR:

\$ 0

\$ 0

\$ 0

GUARANTEED OVERNIGHT DELIVERY BY KWIKASAIR: \$6.00

Enclosed Cheque/Purchase Order/Visa/
Bankcard Mastercard for the balance of: \$ 0

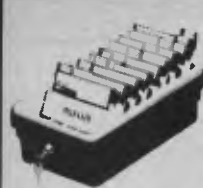
SIGNATURE: _____ CARD EXP: MONTH _____ YEAR _____

NAME: Mr/Mrs/Miss _____

ADDRESS: _____

SUBURB: _____ STATE: _____ P/CODE: _____

TOLL FREE MAIL ORDER NUMBER
008 335 757
 (STRICTLY ORDERS ONLY)
 INQUIRIES TO (03) 543 7877



JUMBO 5 1/4" DISK STORAGE
 If you've got lots of disks, you'll appreciate the extra capacity of this disk storage unit when it comes to locating "that" disk!

Features...

- 100 disk capacity
- Smoked plastic cover
- Lockable (2 keys supplied)
- 9 Dividers/spacers

Cat. C16027 only **\$24.95**



COMPUTER PAPER
 Quality paper at a low price! 2,500 sheets of 11 x 9 1/2", 60 gsm bond paper.

Cat. C21001 Normally \$44.95
SPECIAL, ONLY \$37.95



PAPER TAMER

- Restores order to the top of your desk or work area
- Made of white plastic coated steel
- Stores up to 900 continuous sheets
- Allows perfect paper feed
- Allows easy examination of print out

C21050 **\$44.95**
 (Printer and paper not included)



5 1/4" DISK STORAGE
 Efficient and practical. Protect your disks from being damaged or lost!

Features...

- 50 disk capacity
- Smoked plastic cover
- Lockable (2 keys supplied)
- Dividers/spacers

Cat. C16030 only **\$19.95**



CANON A-40 PRINTER

- Serial Impact Dot Matrix
- 140 C.P.S
- Near Letter Quality Mode
- 1.4K Buffer

Cat. C20040 **\$525**



2 & 4 WAY RS232 DATA TRANSFER SWITCHES

If you have two or four compatible devices that need to share a third or fifth, then these inexpensive data transfer switches will save you the time and hassle of constantly changing cables and leads around.

- No power required
- Speed and code transparent
- Two/Four position rotary switch on front panel
- Three/Five interface connections on rear panel
- Switch comes standard with female connector

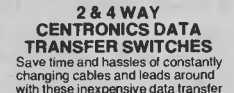
2 WAY Cat.X19120 **\$125**
4 WAY Cat.X19125 **\$145**



3 1/2" DISK STORAGE UNIT

- Holds up to 40 x 3 1/2" diskettes.
- Lockable (2 keys supplied)
- High impact plastic lid and base

Cat. C16035 only **\$19.95**



2 & 4 WAY CENTRONICS DATA TRANSFER SWITCHES

Save time and hassles of constantly changing cables and leads around with these inexpensive data transfer switches. These data switches support the 36 pin centronics interface used by Centronics, Printronics, Data Products, Epson, Star, Micronics, and many other printer manufacturers.

- No power required
- Speed and code transparent
- Two/Four position rotary switch on front panel
- Three/Five interface connections on rear panel
- Switch comes standard with female connector
- Bale locks are standard

2 WAY Cat.X19130 **\$125**
4 WAY Cat.X19135 **\$145**



CENTRONICS GENDER CHANGERS

- Female to Female.
- Saves modifying or replacing non-mating Centronics cables.
- All 36 pins wired straight through.

Cat. X15660 Male to Male
 Cat. X15661 Male to Female
 Cat. X15662 Female to Female

Normally \$33.95
Our Price \$24.95



RS232 GENDER CHANGERS

- Saves modifying or replacing non-mating RS232 cables.
- All 25 pins wired straight through.

Cat. X15650 Male to Male
 Cat. X15651 Male to Female
 Cat. X15652 Female to Female

Normally \$19.95 each
Our Price \$14.95



RS232 DATA SWITCH WITH TESTER

- No power required
- Ideal for 1 computer to 2 peripherals or 2 computers to one peripheral.
- 25 pin RS232 "D" connectors.
- Six dual coloured LED indicators showing certain flow status:

T.D. Transmit Data
 R.D. Receive Data
 R.T.S. Request To Send
 C.T.S. Clear To Send
 D.S.R. Data Set Ready
 D.T.R. Data Terminal Ready

- Size: 200(W) x 68(H) x 150(D)mm

Cat.X19110 **R.R.P. \$169**
Our Price \$149

RS232 MINI PATCH BOX

- Interface RS232 devices
- 25 pin inputs
- 25 leads with binned end supplied
- Complete with instructions

Cat. X15653 Male to Male
 Cat. X15654 Female to Male
 Cat. X15655 Female to Female

Normally \$25.95
Our Price \$19.95



SAKATA HIGH RESOLUTION COLOUR MONITOR
 High quality IBM* compatible monitors, great with VCR's too!

SPECIFICATIONS:
 CRT: 13", 90° deflection colour
Input Signal:
 Video Signal: Separate video signal
 Sync: Positive
 Input Level: TTL Level
Scanning Frequency:
 Horizontal: 15.7KHz
 Vertical: 60Hz
Display Size: 245(H) x 182(V)mm
Resolution:
 Horizontal: 640 dots
 Vertical: 200 lines
Size: 343(H) x 362(W) x 421(D)mm
 Weight: 11.6kg
 Cat. X????? **\$695**



IBM* AT COMPATIBLE!

Assembled & Tested in Australia!

- 6 MHz
- 80286 CPU
- 8 slots
- 1 M/Byte main board
- 1.2 M/Byte Floppy disk drive
- 20 M/Byte Hard disk
- Colour graphics display card
- Floppy and Hard disk controller card
- Printer card and RS232
- 200W Power supply
- Keyboard
- Manual

All this for just \$3,995
 (Monitor not included)



IBM* COMPATIBLES from \$895*

Assembled & Tested in Australia!
 Incredible deals to suit everyone including special package deals!

- **256K RAM:** Colour Graphics, Disk Controller Card, 1 parallel port, 2 disk drives and 3 months warranty only \$1,195
- **640K RAM:** Colour graphics, Multifunction Card, Disk Controller Card, 2 serial and 1 parallel ports, 2 disk drives and 3 months warranty only \$1,295

PERIPHERALS GALORE!!



SAMSUNG TTL MONITOR
 A quality 12" TTL monitor, with a high contrast, non-glare screen at a very reasonable price!

SPECIFICATIONS:
Picture Tube: 12" diagonal 90° deflection
Phosphor: Green (P39)
Mode: TTL
TTL Input Signal:
 Polarity: TTL Positive
 Level: 4V p-p + -1.5V
 Impedance: 75ohm
Active Video Period:
 Horizontal: 44.25 uS maximum
 Vertical: 18.98 mS maximum
Video Band Width: 16 MHz (-3dB)
Scanning Frequency:
 Horizontal: 18.432 + -0.1KHz
 Vertical: 50 Hz + -0.5%
Active Display Area:
 216(H) x 160(V)mm
Display Characters: 80 characters x 25 lines
Input Connector: 9 pin connector
Controls:
 Front: Power ON/OFF, Contrast
 Rear: V-Hold, V-Size, Brightness
 Internal: Vertical Linearity,
 Horizontal Linearity, Horizontal Width, Focus.

Description Cat.No. 1-9 10+
Green X14517 **\$199 \$189**
Amber X14518 **\$199 \$189**



EP1090 DOT MATRIX PRINTER

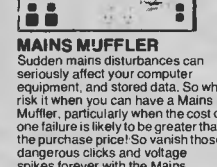
- 80 C.P.S.
- Pica or Elite character set
- 9 pin head
- 100 million character life

Cat.C20030 only **\$435**



MICRODOT 5 1/4" DISKS
 100% certified and error free guaranteed! 5 year warranty Where else can you get top quality disks at these prices?!

1-9 10+
S/S Cat.C12440 \$14.95 \$13.95
D/S Cat.C12445 \$18.95 \$17.95



MAINS MUFFLER
 Sudden mains disturbances can seriously affect your computer equipment, and stored data. So why risk it when you can have a Mains Muffler, particularly when the cost of one failure is likely to be greater than the purchase price! So vanish those dangerous clicks and voltage spikes forever with the Mains Muffler!

SPECIFICATIONS:
 Maximum total load:
 1000W 4 Amp 250V 50Hz
Outlet Sockets:
 Attenuation: 150KHz - 47dB
 500KHz - 88dB
 10MHz - 66dB

Dual T Section:
 VDR Transient suppression
 Surge capacity 200 Amp 8 x 20uS

2 WAY Cat. X10089 **\$249**
4 WAY Cat. X10090 **\$299**



NEC DISK DRIVES

5 1/4" SLIMLINE
 Double sided, double density, 1 M/Byte unformatted.
 Cat. C11906 **\$295**

8" SLIMLINE
 Double sided, double density, 1.6 M/Byte unformatted.
 Cat. C11908 **\$795**



TTL MONITORS
 Fantastic resolution! Enjoy a crisp, sharp image with the latest Pitron TTL monitor/IBM* compatible, green display, swivel and tilt base.

Green Cat. X14510 Normally \$289
Amber Cat. X14512 Normally \$289
SPECIAL, ONLY \$269



20 M/BYTE HARD DISK DRIVE FOR IBM* AND COMPATIBLES
 Includes hard disk controller card.
 Cat. X20010 **WAS \$1,250**
SPECIAL, ONLY \$995
 *IBM is a registered trade mark.



RITRON 2 MONITORS
 Stylish, swivel base monitor, available in amber or green.

Green Cat. X14506 Normally \$235
Amber Cat. X14508 Normally \$239
SPECIAL, ONLY \$199



APPLE JOYSTICKS
 Ideal for games or word processing. Fits most 6502 "compatible" computers.
 Cat. C14200 **\$39.95**



IBM* COMPATIBLE DISK DRIVES
 Tired of paying up to 100% more for Japanese Disk Drives? We now have "direct import" Taiwanese disk drives at much lower prices!

Cat.No.	Description	Price
C11801	500K	\$199
C11803	1 M/Byte	\$239
C11805	1.6 M/Byte	\$259



APPLE* COMPATIBLE SLIMLINE DISK DRIVE
 Japanese Chinton mechanism, compatible with Apple 2+
 Cat. X19901 Normally \$225
SPECIAL \$195



5 1/4" DISK SPECIALS!
 All prices 10 disk boxes!

	1-9	10+
XIDEX S/D/D	\$29.95	\$29.95
Cat C12401		
D/S/D/D	\$38.95	\$36.95
Cat C12410		
High Density	\$125	
Cat C12520		
VERBATIM DATALIFE		
S/D/D/D	\$27.95	\$26.95
Cat. C12501		
D/S/D/D	\$34.95	\$32.95
Cat. C12504		
VERBATIM VALULIFE		
S/D/D/D	\$24.95	\$22.95
Cat. C12421		
D/S/D/D	\$29.95	\$25.95
Cat. C12425		

3 1/2" DISK SPECIALS!
 STOP PRESS!
 PRICES SLASHED ON 3 1/2" DISKS!
 SAVE \$10 PER BOX!!

Verbatim S/S (C12610) \$54.95
 Verbatim D/S (C12612) \$59.95
 Xidex S/S (C12600) \$55.95
 Xidex D/S (C12602) \$79.95

NEED HIGH DENSITY DISKS FOR YOUR IBM AT?
 R.R.P. \$113 Our Price \$99.95



Rod Irving Electronics
 48 A Beckett St, MELBOURNE
 Phone (03) 663 6151
 425 High St, NORTHCOLE
 Phone (03) 489 8866

Mail Order and Correspondence:
 P.O. Box 628, CLAYTON 3168
 Telex: AA 151938



MAIL ORDER HOTLINE 008 335757 (TOLL FREE) (STRICTLY ORDERS ONLY)

LOCAL ORDERS & INQUIRIES (03) 543 7877

POSTAGE RATES:

Weight	\$1 - \$9.99	\$10 - \$24.99	\$25 - \$49.99	\$50 - \$99.99	\$100 - \$199	\$200 - \$499	\$500 plus
	\$2.00	\$3.00	\$4.00	\$5.00	\$7.50	\$10.00	\$12.50

FREE POSTAGE FOR ORDERS OVER \$75 & UNDER 3KG!!

The above postage rates are for basic postage only. Road Freight, bulky and fragile items will be charged at different rates.

Certified Post for orders over \$100 included free!
 Registered Post for orders over \$200 included free!

All sales tax exempt orders and wholesale inquiries to:
RITRONICS WHOLESALERS,
 56 Renner Rd, Clayton,
 Ph. (03) 543 2166 (3 lines)

Errors and omissions excepted
 *Apple and IBM are registered trade names



The Great C Comparo

The compiler generates a proprietary object code format which cannot be used with the DOS linker. Assembly language output can also be generated.

The first pass of the compiler, the pre-processor, performs some fairly strict type checking, rather after the fashion of a Pascal compiler (or the Unix lint program). This considerably improves the portability of code, both from this compiler to another, and from others — if you are likely to have problems with type conversions this compiler will warn you.

Two memory models are supported, through the use of two code generators and two sets of libraris. The small model supports up to 64 Kbytes of code and 64 Kbytes of data, while the large model supports up to 1 Mbyte of mixed code and data.

The dialect of C supported by the compiler is very standard (is there such a thing as very standard? — ed), with some recent extensions, such as structure assignment and the void type. Enumerated types are supported, with some restrictions appropriate to the type; this assists in writing clear code.

Register variables are supported (though it is not clear in the documentation just how many can be used, except on the Z-80 where the limit is one), but bit fields are not supported (a strange omission).

An optimisation pass will work for either speed or space optimisation. And 8087 support is provided, through the use of calls to a library; a software fp library is also supported. The default action is to generate 8087 code; only if the `-n` flag is given on the command line does the compiler load the software fp library. This caused us some problems at first, as our benchmarks refused to run; we feel the default action of the compiler should be to generate plain vanilla code which will at least run.

Support for operation under DOS is good, with functions provided for subdirectory and environment access, as well as process spawning and the more unusual `dup(fd)` function, which forces a duplicate file descriptor.

The documentation is terse but adequate, at 106 pages of laser-printer output (at a guess). However, important information is often buried in throw-away lines, such as the point that the `-n` flag is required on non-8087 systems (above). We'd suggest reading the manual carefully, with

It is always nice to be able to point to local products which are on a competitive level to the internationally marketed United States products which dominate our computer scene. Over the years, a number of products have shown Australian software to be up to world standards . . .

a fluorescent-ink marker in hand.

The compiler comes with a companion relocating macro assembler which accepts a variant of standard Intel ASM-86 mnemonics. It has some unusual features, such as the ability to use temporary labels for local references and to assemble conditional long branches (which assemble to a short branch if possible, otherwise to a short branch of the opposite sense around a long unconditional jump).

Also provided is an interactive symbolic debugger, which, while it cannot display source code, is nonetheless quite powerful and useful. Its syntax takes a little getting used to, though.

Lattice C Version 3.0

THE LOCAL distributor for Lattice prod-

ucts was contacted to provide a copy of the compiler for review, but declined to do so.

The Best Course . . .

As with all categories of software, it is impossible to pick out any one of these products as the 'best'. Each of them has its distinctive features and advantages in different circumstances.

For the beginning C programmer, we'd suggest the MIX compiler because a) it is inexpensive (you might not stick with C in the long run) and b) the documentation has an extensive tutorial. The restrictions of this compiler, particularly the lack of large model support, will not matter to the neophyte, while its ease of use and diagnostic listing will assist considerably.

For the hobbyist/hacker, it's hard to go past the DeSmet compiler. It's fast, fairly complete, and well supported, and a bargain at the price. Anyone writing code with this compiler should not consider membership of the C Users Group — they should simply go ahead and join anyway. A great compiler for writing games, small utilities and even quite large projects.

At the top level, it's a choice between Microsoft C and Computer Innovations Optimising C86. Microsoft C is a higher-performance product, and the inclusion of the Codeview debugger, together with the luxurious documentation, pretty well clinches it. On the other hand, CI C86 has a pretty useful library of functions for access to PC hardware, which is attractive to those writing printer drivers, comms and similar utilities for the IBM PC. The best course? Probably to buy both (?).

Distributors

Computer Innovations C86
The Computer Factory,
214 Harbord Road,
Brookvale 2100.
(02) 938 2522
Price: \$900 (inc tax)

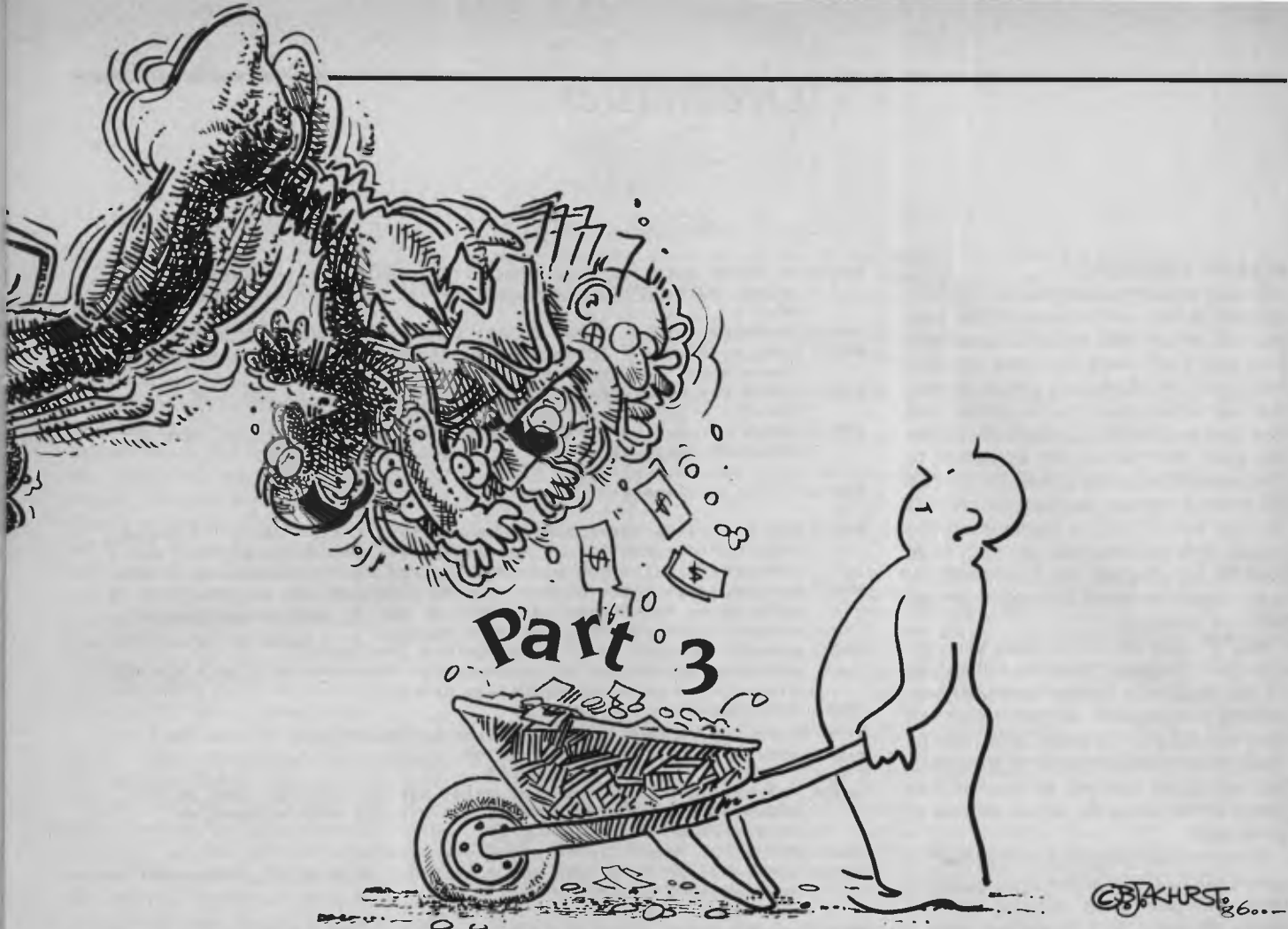
DeSmet C
Computer Trader,
98 Hoddle Street,
Abbotsford 3067.
(03) 417 7044
Price: about \$300

Eco-C
Ecosoft Inc,
6413 North College Avenue,
Indianapolis, IN 46220.
(317) 255 6476
Price: P.O.A

Hi-Tech C Compiler
Hi-Tech Software,
11 Pavonia Street,
Ashgrove 4060.
(07) 38 6971
Price: Z80 version, \$250 (plus tax); MS-DOS version, \$300 (plus tax)

Lattice C
Fagan Microprocessor Systems,
95 Canterbury Road,
Middle Park 3206.
(03) 699 9899
Price: \$982 (plus tax)

MIX C
Techflow,
PO Box 4,
Woodford 2778.
(047) 58 6924
Price (inc tax): \$89.95; MIX Editor, \$65.90;
compiler and editor package, \$129.90.



DEBTMASTER

In this instalment of the ultimate debt-recovery program, Lyndsay Ford tells you how to remove a debtor from file (it's not done with a crowbar).

If you've been following this series, you should now have a copy of Debtmaster with five of its eight Menu options in full working order. Enthusiastic (or broke) readers may even have started putting accounts onto the system, so this month we're going to deal with the sub-program that lets you take them off again. Call it 'PAY.MWB', and follow the rules for program entry outlined in Part 1 of this series.

```

00001 REM ----- PAY -----
00002 POKE 140,1: GOSUB 73: CURS 0: CLEAR: STRS(20000):
      DIM A0(250),A1(250),A2(8): REM Disable <BREAK> key and set
      up arrays
00003 OPEN "I",6,"DATE.DBT": IN#6ON: OUT#0: OUT#0OFF:
      INPUT K3$,K7$,P,D,U: IN#0: OUT#0: CLOSE 6
00004 FOR X=3 TO 14: CURS 1,X: PRINT [A63 32]: NEXT X: REM Clear
      screen display panel
00005 CURS 23,3: PRINT "<<< ACCOUNT PAID >>>"\\ SPC(10) "Date:"\
      SPC(10) "Name:"\ SPC(10) "Address:"\\ SPC(10) "Re:"\
      SPC(10) "Reference:"\ SPC(10) "Amount:"
00006 GOSUB 73: PRINT "Enter name (or first few letters of name)@
      *****";
00007 CURS 22,14: PRINT "PRESS <RETURN> TO ABORT"

```

Get debtor's name

(Note that this text input routine is based on the routine in lines 54-9 of the NEW program - see last part of this series)

```

00008 K2$="": H=43: CURS 42,16: PRINT " "; REM Display cursor
00009 GOSUB 66: IF X=13 THEN 13: REM End if <RETURN>
00010 IF X<>8 AND X<>127 THEN 12 ELSE IF H>43 THEN CURS H,16: PRINT
      CHR(8); "*" ; CHR(8); H=H-1: K2$=K2$(;1,LEN(K2$)-1) ELSE
      CURS 42,16: PRINT " "; REM <DEL> & <BACKSPACE>
00011 GOTO 9
00012 CURS H,16: PRINT CHR(X); H=H+1: K2$=K2$+CHR(X): IF
      LEN(K2$)<12 THEN 9: REM Add key to text string
00013 IF K2$="" THEN 65 ELSE CURS 1,14: PRINT [A63 32]; J=ASC(K2$)
00014 GOSUB 69: IF J<65 OR J>90 THEN 17

```

Load disk file (if it exists)

Debtmaster

Account 'Payments'

Although the title suggests that this sub-program is only used when a debtor pays your bill, in fact there are a number of reasons you might want to delete an entry from your files. Maybe you put an account that was already paid on the system and now have to CANCEL it; maybe the debtor has gone into bankruptcy or moved to Zimbabwe, so you may as well WRITE-OFF the debt; or perhaps you have sent the file to your solicitor for a summons to be issued. These alternatives are built in to the PAY sub-program, but for the sake of convenience the Menu only refers to 'Payment' of accounts.

Key 'P' from the Menu takes you into this option, unless there are 100 entries on the 'Paid Bills Ledger', in which case nothing will happen. As the Menu will have warned you for some time that the 'PAID BILLS LEDGER MUST BE PRINTED', this will hardly take you by surprise. See Part 4 of this series for details on how to go about it.

When the sub-program commences, the screen will display a series of prompts like those you see when entering a NEW debtor (Figure 1, Part 2) and you will be asked to enter the debtor's name or its first few letters. The first letter of your entry will then be taken as the disk filename; hence, if you enter 'SMITH' the program will assume the entry is on the file "S.DBT". This illustrates why in the last part of this series I said it's not a good idea to put accounts on files that don't correspond with the debtor's surname.

If no file of the specified letter exists on the disk then the program will display an error message and let you press <RETURN> to go back to the Menu or try another letter (so you can get Mr Smith's account from X.DBT if you were silly enough to put it there). Otherwise the file will be searched for the name you entered. If a match is found the account will be displayed and you will be asked "Is this the one?" Pressing "N" causes the search to continue until all matching accounts have been checked, then the program announces it can't find the name on the particular file and lets you try a file of another letter (as above) or return to the Menu.

In 99.9 per cent of cases you'll find the account you want on the first try, and you will then be asked if it was PAID (key 'P') or to be CANCELLED ('C'), WRITTEN-OFF ('W') or referred for a SUMMONS ('S'). The last three options let you clear junk ac-

```
00015 ON ERROR GOTO 16: C=0: OPEN "I",6,CHR(J)+".DBT": IN#60N:
      OUT#0: OUT#0OFF: INPUT C: FOR X=1 TO C: INPUT A0(X),A1(X):
      NEXT X
00016 ON ERROR GOTO 0: IN#0: OUT#0: CLOSE 6: IF C>0 THEN 20
00017 CURS 4,14: PRINT "First letter of name isn't a filename -@
      there's no '"': CHR(J): ".DBT'"
00018 GOSUB 73: PRINT "Enter Filename or <RETURN> to Abort *";
      CHR(8);
00019 GOSUB 66: J=X: IF X=13 THEN 65 ELSE CURS 4,14: PRINT [A58 32]:
      GOSUB 69: GOTO 15

Search file for name

00020 FOR M=1 TO C: K0#=A1*(M): K5#=K0#(1,2): K0#=K0#(1,3): K1#=K0#:
      X=SEARCH(K0#,CHR(124)): K0#=K0#(1,X+1): X=SEARCH(K0#,CHR(124)):
      K0#=K0#(1,X-1): REM Get name part of each file string in K0#
00021 X=SEARCH(K0#,K2#): IF X=0 THEN 43 ELSE FOR X=5 TO 13:
      CURS 22,X: PRINT [A40 32]: NEXT X: REM If name found then
      erase text following on-screen prompts
00022 K4#="": FOR Y=1 TO 8: X=SEARCH(K1#,CHR(124)):
      A2*(Y)=K1#(1,X-1): IF Y>1 THEN LET K4#=K4#+K1#(1,X): REM Put
      elements of file string in A2# array
00023 K1#=K1#(1,X+1): NEXT Y
      If file string matches name then display it and ask if it's the
      right one, otherwise jump to line 43.
00024 FOR X=1 TO 8: CURS 23,X+4: PRINT A2*(X): NEXT X: CURS 23,13:
      PRINT "*"; K1#: F2=VAL(K1#): REM Display each element of
      file string
00025 GOSUB 73: PRINT "Is this the one (Y/N)? ";
00026 GOSUB 66: IF X=78 THEN GOSUB 69: GOTO 43 ELSE IF X<>89 THEN 26:
      REM Continue search if "N"

Find out what user wants to do with the account

00027 GOSUB 73: PRINT "Paid <P>, Cancelled <C>, Summons <S> or@
      Written-Off <W> *"; CHR(8);
00028 GOSUB 66: K6#="": IF X=80 THEN 32: REM If X=80 then it's PAID

Routine for accounts not paid

00029 IF X=67 THEN LET K6#="C": K0#="CANCELLED" ELSE IF X=87 THEN
      LET K6#="W": K0#="WRITTEN-OFF" ELSE IF X=83 THEN LET K6#="S":
      K0#="REFERRED FOR LEGAL ACTION" ELSE 28
00030 GOSUB 73: PRINT "ACCOUNT "; K0#; ": Are you sure (Y/N) *";
      CHR(8);
00031 GOSUB 66: IF X=78 THEN 27 ELSE IF X=89 THEN LET F4=F2:
      K2#=K1#: GOTO 42 ELSE 31: REM Allow user to Abort (X=78),
      else set K2#=Code letter, F4=Amount. Then jump.

Routine for accounts paid (Hooray!!)
      (This is another text entry routine)

00032 GOSUB 73: PRINT "Enter amount paid or <RETURN> if paid in@
      full: *****";
00033 CURS 49,16: PRINT "*"; H=50: K2#=""
00034 GOSUB 66: IF X=13 THEN 38: REM Jump if <RETURN>
00035 IF X<>8 AND X<>127 THEN 37 ELSE IF H>50 THEN CURS H,16: PRINT
      CHR(8); "*"; CHR(8); H=H-1: K2#=K2#(1,LEN(K2#)-1) ELSE
      CURS 49,16: PRINT " "; REM <DEL> & <BACKSPACE>
00036 GOTO 34
00037 CURS H,16: PRINT CHR(X); H=H+1: K2#=K2#+CHR(X): IF LEN(K2#)<9
      THEN 34: REM Add key to string
00038 F4=VAL(K2#): IF K2#="" THEN LET F4=F2: REM Implement <RETURN>
00039 IF F4>F2 OR F4=>1000000 THEN 32: REM Filter illegal values
00040 F3=F4: GOSUB 70: K2#=K0#: GOSUB 73: PRINT "*"; K2#;
      " was paid (Y/N)? "; REM Check amount paid
00041 GOSUB 66: IF X=78 THEN NEXT*M 2 ELSE IF X<>89 THEN 41:
      REM X=78 if "N"
00042 NEXT*M 46: REM Exit search loop

File Search loop continues here
```



counts from the system (the program will ask if you are 'Sure' before making the deletion).

If the account was PAID, you will be asked to enter the amount or press <RETURN> if it was paid in full. The amount you entered will be displayed and you will be asked to check it. If it's less than the balance owing, the next prompt will ask if you accept the payment as a 'full discharge'. If you answer 'Y' (for example, you accept Mr Smith's \$50 as full payment of his \$2000 account!), the account will be deleted from the file, otherwise the money will be accepted as a Part-Payment and the account balance will be adjusted. In this case you will be asked if you want to 'Re-Start time period', allowing you to prevent reminders going out to a debtor who is paying by regular instalments.

Phew! Reducing this to one paragraph makes it look complicated, but in practice the prompts follow one another quite logically and you won't have any problems. Once you've made the requisite entries, the file will be saved to disk (or erased if there are no accounts left in it), the Paid Bills Ledger will be updated, and if it contains less than 80 entries you will be asked if you want to enter another payment ('N') or return to the Menu ('M').

The Paid Bills Ledger

This is variously referred to in the program and in these notes as the 'Paid Bills Ledger' and the 'Paid Accounts Ledger' (depending on what looked better on the screen!) It is a disk file entitled PAID.DBT that records all accounts on which an entry is made with this sub-program. Its capacity is 100 entries, at which time access to this sub-program is blocked until the ledger has been printed. Long before this (after 52 entries, a full A4 page) the main Menu will warn you the ledger is filling up.

To view the ledger, press 'E' from the Menu to exit CP/M, then type 'TYPE PAID.DBT <RETURN>'. Then press the <RETURN> key to view each new page. Ledger entries that are not payments in full will be followed by a letter in angular brackets to designate what they are about. These are explained in the second line of the ledger heading (see line 8 of DEBT.MWB, Part 1 of this series).

Next...

Part 4 will cover the sub-program that lets you print reminders, business statistics and the Paid Bills Ledger. □

```
00043 NEXT M: GOSUB 73: CURS 16,16: PRINT "<<< CAN'T FIND NAME ONE
FILE '"; CHR(J); "' >>>"; CURS 0: PLAY 22,110,15
00044 GOSUB 73: PRINT "Enter different file letter or <RETURN> to e
Abort *"; CHR(8);
00045 GOSUB 66: IF X=13 THEN 65 ELSE LET J=X: GOTO 14: REM Abort if
X=13, otherwise search new file
```

Program exits Search loop and continues here if file found (line 42)

```
00046 IF F4=F2 THEN 48 ELSE GOSUB 73: PRINT "Accept part payment as e
full discharge (Y/N)? ";
00047 GOSUB 66: IF X=89 THEN LET F4=F2: K6*="D" ELSE IF X=78 THEN
LET K6*="P" ELSE 47
```

Make "Paid Bills Ledger" entry

```
00048 OPEN "A",6,"PAID.DBT": OUT#6: PRINT CHR(34);
K3*(11,LEN(K3*)-4); K3*(1,LEN(K3*)-1); SPC(11-LEN(K3*));
00049 K0*=A2*(2): IF LEN(K0*)>26 THEN LET K0*=K0*(1,26)
00050 PRINT K0*: SPC(28-LEN(K0*)); K0*=A2*(6): X=SEARCH(K0*,".");
IF X>0 THEN LET K0*=K0*(1,X-1)
00051 IF LEN(K0*)>20 THEN LET K0*=K0*(1,20)
00052 PRINT K0*: SPC(21-LEN(K0*)); SPC(10-LEN(K2*)); "*" K2*: IF
K6*(">") THEN PRINT " <"; K6*: "; K6*="": REM K6*=Code
00053 PRINT CHR(34): OUT#0: CLOSE 6: U=U+1: REM U=No. of entries
```

Routine to Re-Start time period for Part-Payments

```
00054 IF F4=F2 THEN 58 ELSE LET A1*(M)=K4*+K2*
00055 GOSUB 73: PRINT "Re-start time period (Y/N)? ";
00056 GOSUB 66: IF X=78 THEN LET A1*(M)=K5*+A2*(1)+CHR(124)+K4*
ELSE IF X=89 THEN LET A0*(M)=FLT(P): A1*(M)="0"+CHR(124)+K3*+
CHR(124)+K4* ELSE 56: REM If "Y" then replace first element
of file string and days since 1/1/84 variable
00057 F3=F2-F4: GOSUB 70: A1*(M)=A1*(M)+K0*: GOTO 60
```

Routine if paid in full

```
00058 IF M<C THEN FOR X=M TO C-1: A0*(X)=A0*(X+1): A1*(X)=A1*(X+1):
NEXT X: REM Condense file to eliminate account
00059 A0*(C)=0: A1*(C)="": C=C-1: REM Clear last file and reduce
file counter by 1
```

Clean up and end

```
00060 GOSUB 73: CURS 26,16: PRINT "-Saving File-"; CURS 0
00061 IF C=0 THEN KILL CHR(J)+".DBT" ELSE OPEN "O",6,CHR(J)+".DBT":
OUT #6: PRINT C: FOR Y=1 TO C: PRINT A0*(Y); ", '"; A1*(Y);
'": NEXT Y: OUT#0: CLOSE 6: REM Kill file if it has no
entries left, else save it
00062 OPEN "O",6,"DATE.DBT": OUT #6: PRINT "'"; K3*; "'"; K7*;
'"; P; ", "; D; ", "; U: OUT#0: CLOSE 6: REM Save Date file
00063 IF U>79 THEN 65 ELSE GOSUB 73: PRINT "Next Payment <N> or 0
return to Menu <M>? *"; CHR(8); REM Allow another entry if
less than 80 entries on Paid Bills Ledger
00064 GOSUB 66: IF X=78 THEN 2 ELSE IF X<>77 THEN 64
00065 CURS 0: RUN "DEBT"
```

SUBROUTINES

Get key

```
00066 X=ASC(KEY*): REM Clear key buffer
00067 X=ASC(KEY*): IF X>96 AND X<123 THEN LET X=X-32: REM Capitalize
00068 IF X=124 OR X=128 THEN 67 ELSE RETURN: REM Loop if a null
```

```
00069 GOSUB 73: CURS 30,16: PRINT "-Wait-"; CURS 0: RETURN
```

Convert F3 to a string with 2 decimal places

```
00070 K0*=STR(F3): K0*=K0*(1,2): X=SEARCH(K0*,"."): IF X>0 AND
LEN(K0*)>X+2 THEN LET K0*=K0*(1,X+2)
00071 IF X<LEN(K0*)-2 THEN LET K0*=K0*+"0": GOTO 71
00072 RETURN
```

```
00073 CURS 1,16: PRINT [A63 32]; CURS 1,16: RETURN
```

Under The Spotlight

Spotlight, distributed in Australia by Imagineering, is described as a 'desktop manager'. Tim Hartnell tries to put it to work, managing his untidy life.

I MUST DECLARE an interest. I am a life-long convert to the Borland Sidekick school of hidden computer accessories. All my AUTOEXEC.BAT files include SK to boot up Sidekick, and I find I refer to the calendar and calculator in Sidekick many times each working day. So a new program which purports to assist me in the way in which Sidekick does has a pretty hard road to hoe.

To be fair, Spotlight does a great deal more than Sidekick does — but you need to weigh the extra capabilities against the hassle of installing and using it.

There are six functions in the program; appointment book, DOS filer, phone book (with autodialer for a Hayes-compatible modem), note pad, index card file and calculator.

Spotlight is not memory-resident. Although the handler (the Spotlight core) is memory-resident, sitting under your program, waiting for you to hold down the Shift and Alt keys, the accessories themselves are not.

The RAM resident portion of the program eats up 75K, more than the whole of Sidekick, which only needs just over 66K in all without the optional HELP file. The accessory files themselves must be on disk to be of any use. This is no hassle when you're working with a hard disk, but a pig when you're stuck (as I am) with floppies.

If you have a hard disk, skip the next bit where I continue to lament the hassles which are needed to run the program with two floppies.

The unpleasantness continues. Spotlight has a weird protection scheme built in which only allows you to make two copies. If I was to use the program consistently, I would need a copy on each of the major program disks I live with each working day: Wordstar, Gemdraw, BASIC, Personal Publisher, Fontasy and Dynadisk. I cannot make six copies. I cannot keep a Spotlight disk hogging a drive all the time. Therefore, I cannot use Spotlight. The alternative to this is to copy the accessory files themselves onto the relevant disks (you can copy these quite happily without restriction), and use a legit copy of the

core when first booting up. Again, that seems more hassle than it's worth.

All the programs I need with Wordstar, for example (my RAM disk, Sidekick, print spooler, key buffer extender and so on) are in an AUTOEXEC.BAT file, on the WordStar disk. When I want to use WordStar, I simply turn the computer on with the disk in place, or do a reboot. I could not countenance going through an extra disk change, just to keep Lotus (who wrote Spotlight) happy. Life is too short to play the floppy disk shuffle.

I called the Lotus Hotline — (02) 663-3941 — about this, and they said that I was not the first person to bemoan the limited number of copies, but they knew of no plans to release an unprotected version.

Putting It On The Spot

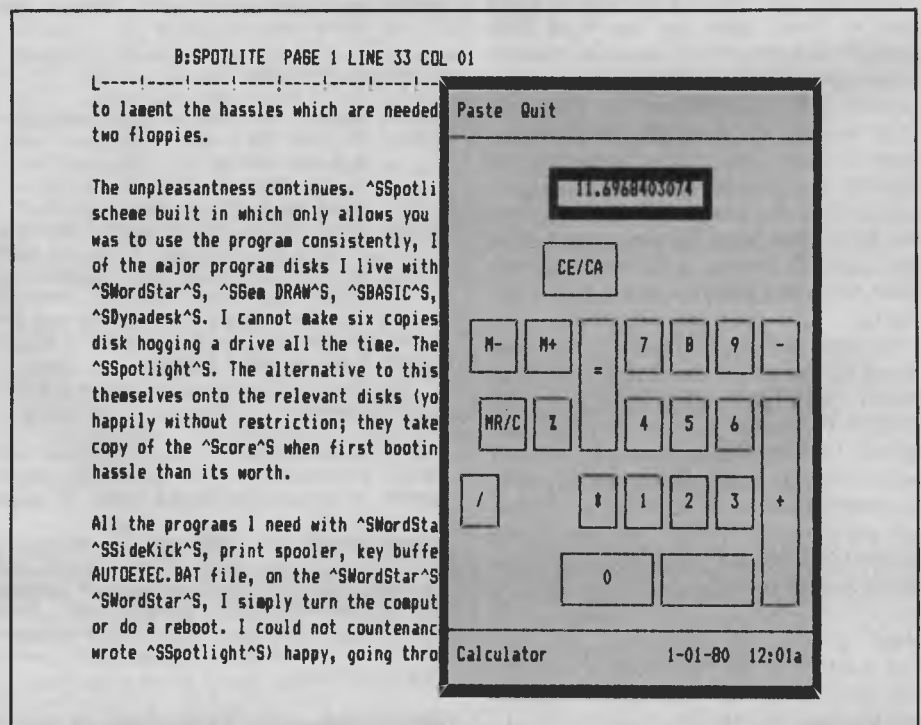
Anyway, having overcome that problem, or learned to live with it, how good is the program?

Before you find out, you really ought to

copy the program. To make your two legitimate copies (and Copywrite doesn't work; I tried it. Spotlight recognizes the pirated copy and freezes up with a self-righteous message) you have to follow an installation program. If you want to wipe one of your legit copies — to move it to another disk — you have to uninstall the first copy to your master, then through the installation process again to make a new legit copy.

If you screw up a disk by using it as a drink coaster, or by sticking it to your fridge with a magnetic holder, stiff. You've lost half your investment (although a damaged master disk will be replaced free within 90 days, or for \$30 after that). Does Lotus really think its program is so wonderful that people will put up with being treated like naughty little performing seals in order to use it? If I wasn't reviewing the program, I would have packed it up and demanded my money back at this point.

However, I forged on, in the interests of *Your Computer* readers (and the folk at



Imagineering who are, no doubt, cursing me at about this point in the review, and vowing never to let me near one of their packages again: "Don't let Tim Hartnell review any of our stuff — he says what he thinks!"

Now, as I mentioned, to call up an accessory, you must have two things: a legitimate copy of the core program up and running under whatever program you're running on your computer, and the accessory file itself on disk. As well, you have to have enough spare memory to load the accessory. Note that some of the accessories (such as an appointments book) produce data files, so you will need disk space for these.

When you call up an accessory on the screen, a drop-down window appears, with its shape depending on the accessory you have chosen. The windows are divided into three areas: the menu/prompt area at the top, the contents in the middle, and the name and date/time at the bottom.

The menu/prompt area takes up one or two lines at the top of the accessory window, and contains a list of commands for using the accessory. The large area in the middle of the window is the contents window, where you actually do the work associated with the accessory. At the bottom of every accessory window is a line that shows you the name of the accessory and the current date and time.

The Appointment Book

This places items in, and displays, a daily schedule, a weekly, or a monthly calendar. It sounds an alarm to remind you of appointments (even while you're using another program), automatically schedules weekly meetings which occur on a regular basis, indicates overlapping meetings, displays the daily schedule in 15-, 30- or 60-minute intervals (Oh! for a life so predictable, and so ordered!) and can accommodate up to 90(!) meetings a day.

The DOS Filer, a genuinely useful accessory (similar, although more limited, programs exist in the Public Domain), allows you to perform operating system tasks without leaving your current program. You can do such things as formatting disks; display, copy, delete and rename files; and list, create, delete and sort directories, all without leaving your principle program.

The phone book holds up to 500 different entries in each data list (and can search 'instantly' through 36 such lists for a name, address and phone number you

want). Version 1.1 of the program, the one provided for review, will also dial numbers for you (this feature was not on 1.0) — simply by move your cursor to the start of the number you want to call.

The note pad gives you eight separate pages for text, within the framework of a simple word-processor, and saves the text in a DOS file you can later edit with your own word processor; it will also print your text.

The index card file can, like the phone book (of which it is a cousin), maintain up to 36 separate indexed lists, store up to 500 entries in alphabetical order in a single list, search for entries which you specify, and print the whole list, or single entries.

Finally, the calculator (which uses the numeric keypad, automatically setting 'Num Lock', so the arrow keys don't work), includes the four basic arithmetic functions, memory keys, constants and a percent key, and inserts results into the program you're using.

To run the program, you need an IBM PC or XT, or COMPAQ (the documentation says nothing about any other clones), 75K spare RAM for the resident bit, and additional RAM for the accessories themselves, DOS 2.0 or higher. It costs \$140.

The real question, at the end of the day

(or the review) is: Do you want it? I couldn't face using it. If I had a hard disk, and thought I would never need more than two copies of the program, it certainly would be worth considering. If you're a floppy person, like me, and you only have two programs around which you base your life (or you're incredibly organised and patient, and are willing to load in the handler separately each time you use your computer), Spotlight might be just what you need.

But for me, until it is released in a completely unprotected form, I'll dial my own phone numbers, and stick with Sidekick. I'll not be a performing seal for any software company. □

PRODUCT DETAILS

Product:	Spotlight
Manufacturer:	Lotus Corp, USA
Review Copy:	Imagineering Pty Ltd, 77 Dunning Ave, Rosebery 2018. (02) 662-4499
RRP:	\$140

Operating system tasks can be done with the DOS Filer.

B:SPOTLITE PAGE 2 LINE 10 COL 01

-----R
uninstall the first copy to your master, then through the
in copy.

View	Up	Home	Sort	Other...	Delete
Copy	Rename	Mkdir	Paste	Quit	
B:\					
DELFA	BAS	1247	1-01-80	3:56a	
FEEDBACK		12928	1-01-80	1:46a	
RANDOM	BAS	80	1-01-80	4:58a	
SPOTLITE		8448	1-01-80	12:40a	
SPOTLITE BAK		7424	1-01-80	12:30a	
TEXTDEL		7936	1-01-80	3:49a	
TURBOREV		15744	1-01-80	12:05a	
Filer			1-01-80	12:03a	

ks coaster, or
lder, stiff. You've
ink their program is
ng treated like
me it? If I wasn't
up and demanded my
our Computer^S readers
bt, cursing me at
ver to let me near
artnell review any
).
ou have to have two
ram^S up and running
computer, and the
ave to have enough
some of the

HYPEC ELE

▶ *If you're not buying from us,*

NOBODY BEATS OUR PRICE ON THE DUAL SPEED PC-88!

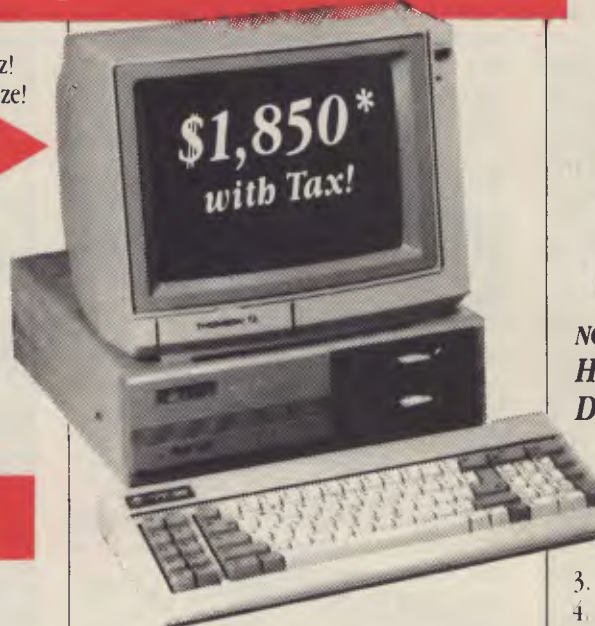
\$1,850* Tax included

Check the PC-88 Advantages:

1. Dual Speed Processing: 4.77 & 8Mhz!
2. Small Desk Footprint: 2/3 IBM PC-size!
3. 8 Full-length Slots: 6 FREE!
4. 640Kb RAM Standard!
5. 130W Power Supply!
6. 2 x 360Kb Floppy Disk Drives!
7. Re-set Button Standard!
8. Legal BIOS!
9. Legal DOS 3.2!
10. Includes Multi-Function Boards!
11. Choice of Colour or Monochrome Graphics Board!
12. Top-Quality Japanese Boards!

*Note: Monitor extra.

DUAL SPEED PC-88!



NOBODY BEATS OUR PRICE! HYPEC SUPER PC Dual Speed: 4.77 & 7Mhz!

\$1850* Tax included

Check the Advantages:

1. Dual Speed Processing: 4.77 & 7Mhz!
2. 6 Months Full Warranty!
3. 640Kb RAM Standard!
4. 2 x 360Kb Control Data Disk Drives!
5. Parallel Port!
6. Serial Port!

HYPEC SUPER PC HARD DISK SPECIALS:

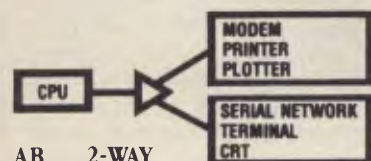
10Mb SYSTEM: \$2600 tax inc.

20Mb SYSTEM: \$2900 tax inc.

DATA SWITCHES

Work faster, more effectively!

Our AB or X Data Switches let your computer system share data output between Modems, Printers, Plotters, Networks, Terminals!



AB 2-WAY

AB SWITCH

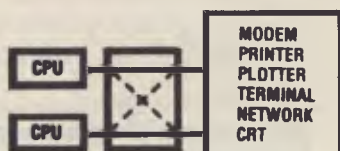
PARALLEL: \$80
SERIAL: \$70

ABC PARALLEL: \$110

3-WAY SERIAL: \$100

ABC PARALLEL: \$125

4-WAY SERIAL: \$115



AB
CROSSOVER

PARALLEL: \$110
SERIAL: \$100

- All lines connected • High-quality Rotary switch • All-metal case • Low cross talk
- Anti-skid feet

SuperCom

\$175 tax inc.

SuperCom II is the fully-supported Australian Communications Software for the PC/PC XT/PC AT and Compatibles. Out-talks CrossTalk with full Viatel support and Terminal mode! Buy Australian-made & save!

LOOK AT THESE HYPEC SUPER SPECIALS:

SOFTWARE:

The Visible Computer:	\$95
Learn 8088 Assembler the easy way	
Peeks & Pokes:	\$60
Get MORE from your PC	
The Inside Track:	\$80
Power for your PC	
Framework II	\$1100
Lotus 123	\$750
Symphony 1.1	\$950
Clipper Compiler dBII	\$947
Microsoft Word	\$650
Sidekick	\$140
Microsoft Word & Mouse	\$850
Easy	\$220
dBase III+	\$755
Turbo Pascal	\$120
WordStar	\$375
WordStar 2000	\$470

Custom Software Solutions

Call us for prices on any software not listed!

Note. All prices quoted are plus sales tax. E & OE

PRICES ARE SUBJECT TO CHANGE WITHOUT NOTICE AND ARE CURRENT AT TIME OF ADVERTISING PREPARATION. FREIGHT EXTRA

CTRONICS

you're likely paying too much!

NOBODY BEATS OUR PRICE!

DUAL SPEED

HYPEC SUPER AT

6/8Mbz Clock Speeds!

\$4,600 plus tax

Here's why

HYPEC SUPER AT 20Mb System

with 12 Months Full Warranty is

Australia's best-value business buy:

- 1.2 Mb Floppy Disk!
- 20Mb Hard Disk (up to 140Mb available)!

- Dual Speed Processing: 6 & 8Mhz!
- 640Kb RAM Standard!
- Licensed Phoenix BIOS!
- Licensed DOS 3.1!
- Parallel Printer Port!
- 2 Serial Ports!
- 200W Power Supply!
- Battery-backed Clock/Calendar!
- Colour or Monochrome Graphics!
- Top-Quality Japanese Boards!
- Optional Tape backup available!

*Note: Monitor extra.



**DUAL SPEED
HYPEC SUPER AT
6/8Mbz Clock Speeds!**

- 7. Games Port! *Note: Monitor extra.
- 8. 8 Expansion Slots!
- 9. Deluxe low-profile detachable Keyboard!
- 10. Choice of Colour Graphics or Monochrome Graphics Board!
- 11. Clock/Calendar with Battery back-up!

**WE'LL MATCH PRICES
ON MOST ITEMS!**

ADD-ON CARDS:

Magic Video Card (Colour/Mono Combination)	\$299
EGA Video Card Compatible	\$480
Colour Graphics Card: RGB, Composite, B&W	\$230
Monographics Card (720x348) Hercules-type	\$210
Multi I/O Card: IP/port, 1 S/port, Clock, etc.	\$245
I/O Plus Card: IP/port, 1 S/port, Clock/Cal, etc.	\$215
Floppy Disk Controller Card	\$85
Parallel Printer Port Card	\$75
DTC Hard Disk Controller Card & Cables	\$300
OMPTI Hard Disk Controller Card	\$325
WD Hard Disk Controller Card	\$290
TRANS-NET Networking Card	\$595

HARD DISKS:

(Formatted Size)

- 10Mb & Controller	\$750
- 20Mb & Controller	\$1100
- 42Mb & Controller (v/c)	\$2845
- 71Mb & Controller (v/c)	\$3732

MONITORS

- Composite Hi-Res	\$199
- Monochrome Hi-Res G or A	\$275
- TVMMD3 14" Colour	\$750
- TVMMD7 14" Colour Hi-Res (EGA)	\$960
- Thompson 36512	\$630
- Thompson 36382	\$770
- Thompson 31311	\$1050

PRINTERS

- Brother M-1109 80 Col	\$420
- Brother M-1509 132 Col	\$825
- Twinwriter 5 Dual-Head	\$2100
- Star NX10	\$525
- Star NL10	\$475
- Star NB15 300CPS	\$1795

MISCELLANEOUS

- Microsoft Mouse	\$320
- Z-NIX Mouse	\$160
- HYPEC 12/75 Modems WITH SUPER COM2	\$275
- IBM-compatible Joystick	\$45
- 10 Blank Disks DSDD	\$25
- Printer Cable	\$30
- Printer Paper 80 Col 2000	\$45
- Logimouse + Pak	\$252

**PHONE FOR CATALOGUE
& PRICE LIST: (02) 808 3666**

HYPEC SUPER SERVICE!

We've built up a great reputation for Service in the last five years. It's formed the basis for our business growth. And it's a reputation we're very proud of!

- We look after you. • We listen to you.
- We suggest solutions to your needs.
- We solve your problems. • We answer your questions on the phone. • We sell to you at the keenest prices possible. • We carry out service repairs in-house. • We're fast, so you're not hit with big repair bills.

We're professionals, with 20 years' total experience in computers and electronics sales and service. But most of all, we're on your side!

Call in soon - discover real Computer Service is spelled: HYPEC!

**HYPEC
ELECTRONICS
HYPEC ELECTRONICS PTY. LTD.,**

21 Ryedale Road, West Ryde NSW 2114
PO Box 483 Ryde, Sydney NSW 2112

Tel: (02) 808 3666 (4 lines)

Cable: LAMRON SYDNEY. FAX: (02) 808 3596

TELEX: AA71551 LAMRON

TELEPHONE ORDER HOTLINE:

(02) 808-3666

Bank cheque, money order, Visa, Bankcard
& MasterCard accepted.

HYPEC.3

PATIBLE FULL-SERVICE RETAILER!

Explore AI on your PC

Admit it. You've spent a lot of hard-earned cash to get your computer, and it's a bit of a grind to discover you have to shell out a hell of a lot more just to get your software!

And if you're after really powerful programs for your computer - IBM PC/compatible, Apple II or Mac - the prices all seem to be in the \$100 to \$400 range. Why on earth should you have to pay that much, just so you can make full use of your computer?

Well, now you don't have to. Interface Publications has been in the cheapo software business since August 1985 (and we've got thousands of happy, smiling customers to show we've been pretty busy since then) and we've just released our latest catalogue. When you get your copy, you'll see that instead of prices from \$100 to \$400 and up, our software starts at just \$17.00 a disk! We provide a full support service for all the material we sell. We use PC's, Apples and Macs ourselves, so we have a fair idea what we're talking about (some of the time!), and we're constantly adding to our software range.

Software which gives you the power... without the price!

IBM PC/COMPATIBLES

- pBASE Relational Database. Database designed for programmers in which you can manipulate information in the database and interrogate it. pBASE is based on SQL (the Structured Query Language). \$17.00
- PC-Style Analyser Analyse your writing for readability. Checks ASCII or WordStar files to give report on how readable your writing is, based on several factors \$17
- Word Processor Enhancer Includes spelling checker, PC-Outline (like Thinktank), LQ-Print (for near letter-quality print on dot matrix printer) WS-DOS (WordStar to ASCII file and vice versa) and Word Count. \$17.00
- Flido Bulletin Board. Two-disk set to allow you to set up your own bulletin board. All you need. \$25.00
- Replicating Reality: Developing & Exploring Computer Simulations. 96-page printed manual, plus disk, designed to introduce you to the potential of computer simulations. Working mechanisms/theories behind simulation creation demonstrated in detail. Many programs. \$39.95
- Exploring Artificial Intelligence on your IBM PC. Printed manual plus disk to explore the fascinating world of AI. Discover the history, theory and practice of AI. Programs include BLOCKWORLD, SYLLOGY and X-SPURT. \$39.95

APPLE IIc/IIe/II+

- Business Basics I General Ledger// address book, Hi-value selection of several valuable accounting and other business and home office programs. Includes ledger, mailing list and database programs. \$17.00
- Chess & other Brain Games. Hi-res Chess, Poker, Simon, Checkers & more! \$17
- Machine Code Tutorial. Take the first steps to mastery of Apple machine code with this complete, easy-to-follow tutorial. \$17
- Replicating Reality: Developing & Exploring Computer Simulations. 96-page printed manual, plus disk, designed to introduce you to the potential of computer simulations. Working mechanisms and theories behind simulation creation demonstrated in detail. Many programs to run on your Apple with this package. \$39.95
- Exploring Artificial Intelligence on your Apple. Printed manual plus disk to explore the fascinating world of AI. Discover the history, theory and practice of AI. Programs include BLOCKWORLD, SYLLOGY and X-SPURT. \$39.95
- The Signwriter. Produce great big signs, greetings, with any printer. \$24.95
- Communications Four. A 4-disk set so you, your Apple and a modem can start your own bulletin board, plus numerous general communications programs. \$39.00

MACINTOSH

- Games Volume Two. Games include BILLIARDS (full graphics, superb game), MOUNDS OF CETA (challenging maze game), STARBURST, NERD, BANZAI, DEFCON I and more! \$22.00
- MacPaintings. Two-disk set absolutely chocka with MacPaint pictures to incorporate into your own artworks. Copyright free. Two disks. \$30.00
- DESKTOP PUBLISHING: THE BOOK. "It's a ripper!" said Desktop Publishing magazine. Full info on this fascinating field. Start your own dtp bureau. Lots of material to copy and adapt. (No sales tax) \$29.95
- Applications If you're serious about using your Mac effectively, this disk can help you, with a host of useful application programs. \$22.00.

Interface Publications (Aust.) P/L,
Chelsea House, 34 Camp St.,
Chelsea, Vic., 3196 (03) 772 7566
Please send me the indicated software for my
 IBM PC Apple Mac

Please send me the new catalogue

Total value of order \$ _____
PLUS 20% for sales tax \$ _____
PLUS \$3.00 post/packing \$ 3.00
Total for this order \$ _____

I enclose cheque, or charge my

Bankcard Visa

Card no: _____

Name _____

Address _____

Postcode _____

The Interface Software Catalogue

IBM PC
Apple II
Macintosh

Software which gives you the power
- without the price

The power of machine code programming
The power of FORTH, Pascal and Prolog
The power of arcade and adventure games
The power of programmer's utilities
The power of artificial intelligence and expert systems
The power of cheap word processors,
even microfilm and software,
spread sheets - and much more

Interface Publications and the Australian Public Schools. Alloway have recently issued the price to other day's titles in a separate list of day's titles - not in regular direct order list and catalogue.

A growing interest in computer software is inevitable, along with a complete and flexible office workstation, word, spreadsheet software, but never that same old same people are ready to do each month, no real-of-interest, comprehensive, because of this. It is becoming more and more to market software and local software development to give this priority with - which means no one else's printing copies to you.

This is an ideal catalogue - essential with software to give you power. Please do your request in the past. We hope you have ordered all your software to be of interest to you.

The Annual Interface Publications (Aust.) P/L Ltd

1987-88 Date of our software is represented, as of the date of order to our books, as per the request service for all the software in this catalogue.



The Computer Calendar - just \$2.50!

A great gift idea. 18-month calendar (January 1987 through to June 1988), with a complete computer program for each month, ready to run on any computer with BASIC. Calendar opens out to A4 size, showing one month, plus the program listing, along with notes on how the program works. (No postage cost; no sales tax on this item).



THE LES BELL

ENCYCLOPEDIA OF



ATCH



ILE



Batch files are text files containing, at the elementary level, sequences of DOS commands and programs to be run. The most common use of batch files is to ensure that a sequence of commands is executed correctly, without relying on the user's memory to get it right. Remember? Here's another batch.

PROGRAMMING—Part 2

YOU LEFT ME last month engrossed in making batch files interactive, using the public domain program ASK.COM. More powerful is the ability to use environment variables within batch files. There are several ways this can be done.

The simplest way to set an environment variable is to set it using the SET command. For example:

```
SET USER=Fred
```

In typing a SET command, do not type any spaces around the equals sign — they

seem to upset the command. The command is not case sensitive; the variable name is always transferred into upper case when it is stored, while the value is stored exactly as you type it.

You can type a SET command before running the batch file, or alternatively you can incorporate the SET command into the batch file. However, there is a restriction on SETting environment variables from within batch files: the operation of the batch file processor restricts the growth of the environment, so that only a few strings can be stored there. By con-

trast, if you keep setting strings into the environment manually, it can expand up to 32 Kbytes in size.

There is a public domain utility (I forget what it's called, unfortunately) which does for environment variables what ASK does for the ERRORLEVEL. In other words, it is like a BASIC INPUT statement for batch files. By the time this appears in print, you can expect to see either that program or one of mine that does the same thing on the *Your Computer Bulletin Board*. I would have had one written in C except that my C compiler can only read environment

Batch Files

variables, not write them.

Having got a value stored in an environment variable, how do you access it from within a batch file? The answer (not described anywhere in the DOS documentation, incidentally) is yet another variant on the use of percentage signs. To extract the value of variable 'envvar' in a batch file, simply refer to it as '%envvar%.' For example, in a user logon batch file:

IF '%HELP%'=='ON' TYPE LOGON.HLP
This will type a help file should the user require it. You can similarly store passwords and other information in the environment.

Wildcard Expansion

Several DOS commands, and other programs, do not accept wildcards in the filenames passed to them. For example, the DOS FIND command, a very useful little Chinese copy of the UNIX grep command, accepts a list of filenames, but no wildcards, which is rather inconvenient. Its syntax is:

```
FIND [flags] "string" filelist
```

This means that to search all .LET files for a particular name, you would have to give the full list of all filenames — in other words, run a DIR command to find all the .LET files first. Isn't this the kind of repetitive task the computer is supposed to do for you?

A solution comes to us courtesy of the DOS FOR batch command. Wildcards are permissible in the parameter list of the FOR command, and are automatically expanded. So, we can easily create a batch file to search all .LET (or any other type) files for a string:

```
ECHO OFF
```

```
FOR %%V IN (%2) DO FIND %1 %%V
```

If we call this batch file GREP.BAT (cheeky, but meaningful!) we can invoke it with a command like

```
C: C86>GREP "printf" *.C
```

which will search all the C source files in this subdirectory to find those containing calls to the printf function. Likewise:

```
C: C86>GREP "Smith" *.LET
```

will find all letters which mention a person called Smith.

Redirection and Batch Files

If you want to save all the output from the GREP batch file into a text file for later perusal with a word processor or editor, you cannot simply type —

```
C: C86>GREP "Smith" *.LET >GREP.OUT
```

This will just create an empty GREP.OUT file, and the output of the FIND com-

```
/* Make empty file for history and similar utilities */  
  
#include "stdio.h"  
  
main(argc,argv)  
int argc;  
char **argv;  
{  
    FILE *f;  
  
    if(argc != 2) {  
        printf("Usage: make filename");  
        exit(1);  
    }  
    if((f = fopen(argv[1],"w")) == 0) {  
        printf("make: Unable to make file %s",argv[1]);  
        exit(1);  
    }  
    fclose(f);  
}
```

Listing 1. MAKE.C

mands will go to the screen as usual. Instead, the redirection must be applied inside the batch file. However, you cannot simply use output redirection, because each time the FIND command is run, its output will overwrite the file created by the previous run — so only the output from the last FIND will be saved.

To get around this, we must use **append redirection**, which sends its output to the end of the target file, after any existing material. Now the problem is that if we write append redirection into the batch file, it will simply append its output onto any previous run of the batch file, instead of creating a fresh, new file. No problem: I had already written a program called MAKE.C which creates an empty file, in connection with a command logging system I had developed — see Listing 1.

Listing 2 shows a rather smarter batch file, which will send its output to the screen or to an optional output file. It is left as an exercise to the reader (shades of school textbooks!) to add optional append or overwrite of the file %3.

```
echo off  
if '%3'==' ' GOTO nosave  
make %3  
for %%v in (%2) do find %1 %%v >> %3  
goto end  
:nosave  
for %%v in (%2) do find %1 %%v  
:end
```

Listing 2.

Redirection is useful for other purposes, too. For example, in a batch file, you may want to change the PATH searched for program files, and then set it back the way it was later. How can you store the current

PATH setting?

The answer is this technique:

```
PATH >OLDPATH.BAT  
.  
(batch processing)  
.  
COMMAND /C OLDPATH
```

The batch file OLDPATH.BAT will contain a single line of the format

```
PATH=C: ;C: BIN;C: C86
```

or whatever applies to your system. When it is executed it sets the path back the way it was.

Dynamic System Configuration

A common problem with departmental PCs is the sharing of PCs between users who have conflicting requirements. For example, one user might use the machine with dBase III, and might want a 256 Kbyte memory disk drive, while the other user wants as much main memory as possible in order to run large Lotus 1-2-3 spreadsheets.

Since (under DOS 3.1) the memory drive is set up by the CONFIG.SYS file, changing the system around means editing that file, saving it and then rebooting. This process is tedious and prone to error but it can be automated thus —

First, create the two different CONFIG.SYS files, in your BIN subdirectory, under two different names. For example, LOTUS.SYS:

```
COUNTRY=061  
and DBASE.SYS:  
DEVICE=VDISK.SYS 256  
BUFFERS=30  
FILES=20  
COUNTRY=061
```

Batch Files

Now, create two batch files, as follows. First, DBASEMEM.BAT:

```
ECHO OFF
COPY BIN DBASE.SYS CONFIG.SYS
REBOOT
```

and then LOTUSMEM.BAT:

```
ECHO OFF
COPY BIN LOTUS.SYS CONFIG.SYS
REBOOT
```

giving the command

```
C: BIN>LOTUSMEM
```

will copy the appropriate contents into CONFIG.SYS and then reboot the system, while

```
C: BIN>DBASEMEM
```

will set it up for dBase. The only thing you need is the REBOOT command, which is given in Listing 3. (A machine-readable version will be found on the YC Bulletin Board).

The same technique can be applied to selecting one of multiple copies of AUTO-EXEC.BAT. The only restriction is that REBOOT.EXE does not work if there is co-

```
main()
{
    int sysint();
    sysint(0x19,0,0);
}
```

Listing 3. REBOOT.C

resident software — like Sidekick — in memory.

Memory Drives

DOS 3.1 comes with a device driver — VDISK.SYS — which implements a memory virtual disk drive; in other words, it uses part of memory as a pseudo disk drive. Most multi-function and memory cards come with a similar piece of software. I'll refer to these memory drives as vdisks.

To the user, the vdisk appears to be a small hard disk. It is very fast — typically three times faster than a hard disk — and quite reliable (it has no moving parts). However, it has one major drawback — unlike a real disk, it is volatile; the con-

tents are lost when the power goes off.

While the probability of that may be low, there is still the possibility of someone tripping over the power cord — that's not too bad, since you can always hit them. But when you finish work for the day and switch off, only to realise that you haven't copied the vdisk contents back to a real disk, the frustration reaches a high point.

In order to avoid disaster, therefore, some guidelines should be followed for the use of vdisks:

1. Never, never put anything valuable into a vdisk. Live databases, for example, should not be placed in vdisk, however, database index files, which can be automatically recreated, are fair game.
2. Automate the operation of the vdisk by the use of a batch file.
3. Put the most frequently accessed files in the vdisk.

For example, in running dBase applications (a typical application where a vdisk

THE RUGGED COLOUR PORTABLE HAS ARRIVED :

- FEATURES: . IBM ® Compatible.
- . 240v AC or 12v DC with optional power pack.
 - . High resolution; 610 x 480 10 inch colour monitor [superior to most larger screens]
 - . Shock mounted chassis in scratch resistant Aluminium case.
 - . 640k RAM.
 - . 2 x 360k drive [1 x 1.2 mb + 1 x 360k AT version].



- . 1 x parallel and 2 x serial interface.
- . 4 vacant expander slots.
- . Australian made, with full 1 year warranty.
- . B02B6 based AT model available.
- . Optional 20 mb / 50 mb internal hard disc drive

PRICED FROM ONLY \$3940 Tax paid. Sea Search Pty Ltd
6 Lauderdale Court, Kippa Ring 4020: (07) 2840293



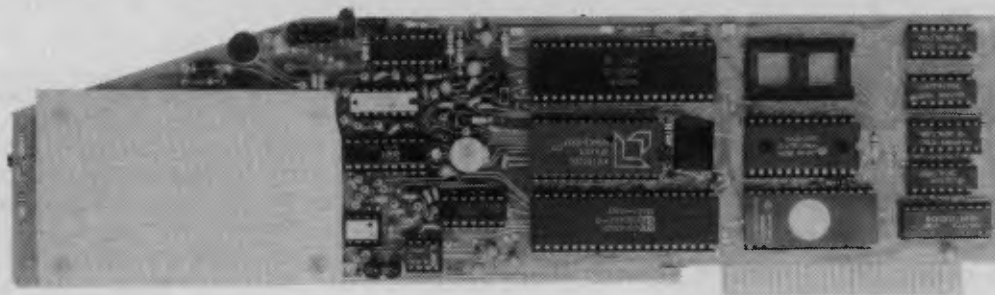
Cairns means hassle-free living. So does our Software! For NEC, IBM & compatibles.

- Finance
- Insurance
- Video
- Produce
- Booking
- Dental
- Aviation
- Restaurant
- Schools
- Fishing
- Legal
- Farming
- Real Estate

CYPHER RESEARCH LABS.
P.O. BOX 4, MACHANS BEACH 4871
PHONE: 55 9138

MODEM FOR APPLE II & IIE

NOW IN STOCK WITH FULLY OPERATIONAL FIRMWARE & NEW FEATURES



* Super intelligent direct connect MODEM/VIATEL terminal for APPLE II, IIE & compatibles fully contained on a single card — plugs into slot#2 — does not require separate serial card or software. All software is permanently resident in an onboard 128K EPROM. It is hidden in the slot#2 card space, leaving the whole of memory completely free for other programs unlike disk based comms software which must occupy the main memory excluding other programs. It is menu driven and automatically senses for ProDos or DOS 3.3 operation. Received files are appropriately converted before saving and can be used.

Sending/receiving files is very simple:—

- Press "ESC" to display menu.
- Select "(S) END A FILE" option
- Answer the prompt "FILENAME?:"

The modem will search the disk for the file, make all the decisions (e.g. binary, basic, textfile, DOS 3.3 or ProDos) and transmit it in the correct format. <CR> transmits the file in memory. Similarly to receive a file select "(R) RECEIVE A FILE" option.

* AUTO ANSWER — AUTO DIAL. Senses true dial tone, ring tone, busy tone and acts intelligently, returning status messages. Characters can be included in the phone number to set baudrate, pause, "await dialtone" and multiple redial on busy. On answer, it selects the incoming baudrate by precision frequency measurement. This is much more reliable than the normal autosearch using carrier detect which is often confused by voice and phone tones. A reliable autosearch is a must for bulletin board operation.

* 300 Baud full duplex or 1200/75 and 75/1200 with fast automatic line turnaround. An upgrade kit to add V22 (1200/1200 baud) and V22 Bis (2400/2400 baud) will be available later.

* Main menu option "(V)IDEOTEXT" shows the VIATEL menu. It becomes a full graphics VIATEL terminal, automatically dialling and transmitting the user ID stored in the battery backed ram. When online, a keypress will immediately save pictures to memory. These can be reviewed later and selectively saved to disk or printed (requires a graphics printer card). Pictures can be loaded from disk and printed out. The modem can act as a videotext host and can be programmed to act on frame information. e.g. — use the clock to ring "MONEYWATCH" hurly and dial you at the office if your shares move outside a given range.

* TELESOFTWARE DOWNLOAD facility to purchase programs over VIATEL from suppliers such as MICROTEx 666 and TANGO.

* A full wordprocessor in EPROM for pre-composition of text before transmission. It can also be used to edit or print received files as well as for general wordprocessing.

* Onboard battery backed calendar clock can time and initiate calls or keep an activity log. ProDos uses it to time and date disk files and it is accessible from Basic.

* 2Kx8 battery powered CMOS RAM stores default parameters, phone numbers, ID, password, logon strings, search codes and setup parameters (e.g. baud rate, parity, printer ON) for each number, allowing single keystroke call establishment to specific areas of complex databases. Main menu option "(T)ELELIST" displays the list of 23 names and one is selected.

* Incorporates XON/XOFF and CHRISTENSEN error correcting protocol. Textfiles are not so fussy but error correction is a must when transferring program files. A debug function can display normally invisible control characters sent by the host.

* Can output directly to printer even when online at 1200 Baud — a fast printer is not required as the printer is spooled out of the receive buffer. A "FILTER" function is available to remove screen control characters from textfiles (these can drive a printer crazy). Special scroll routines print to 80 column screen and printer at 1200 Baud without any lost characters.

* Unique "PHANTOM MODEM MODE" function allows the modem to be permanently connected with the normal phone. When answering, if it doesn't immediately detect a calling modem it generates ringing tone back to the calling party and sounds the APPLE bell, giving you 60 seconds to answer the phone.

* If you have previously purchased this modem and have not yet received an updated EPROM VERSION V2.18 and a manual, contact AUTOMATIC ICE CO. — there is no charge for these.

AUTOMATIC ICE COMPANY

Mastercard & Bankcard

10 SMITH STREET, CHARLESTOWN, 2290.
PHONE (049) 63 3188 — (049) 63 1386

Price **\$299** (incl. S/T)

Batch Files

makes a big difference) files should be handled as shown in Table 1. And the system should be automated with a batch file as shown in Listing 2 (assume hard disk C: and vdisk D:).

What Does It All Mean?

In this article, I hope I've shown you some of the power of batch files, some of the intricate things you can do with them. I hope I've also corrected the poor documentation from both Microsoft and IBM on this subject, and provided you with some useful tips and techniques. In addition, I've suggested ways in which the batch processing facility can be made more useful with the addition of some simple C or assembler utilities.

Where do you go from here? Undoubtedly, you'll have some problems of your own which are particularly amenable to batch file solutions. If you want to practice your batch file programming skills, here are some suggested applications:

- Menus,
- System configuration in response to

.DBF (database files)	left on hard disk (too valuable)
.NDX (index files)	possibly placed on vdisk
.PRG (command files)	definitely on vdisk
.FMT (screen format files)	definitely on vdisk
.FRM (report format files)	left on hard disk (slow anyway)
DBASE.COM	left on hard disk (accessed once only)
DBASEOVR.COM	definitely on vdisk (accessed very frequently)

Table 1.

```

ECHO OFF
ECHO Copying files, please wait
COPY C:*.PRG D:
COPY C:*.FRM D:
COPY C:DBASEOVR.COM D:
COPY C:*.NDX D:          <- if room
D:
C:DBASE <application name>
COPY *.NDX C: /V        <- copy index files back
C:
    
```

Listing 4.

- user login,
- Electronic Mail,
- Security,
- Subdirectory clean-up,
- Location of overlay files, and
- Moving files between subdirectories.

Good luck with your batch file programming. If you come up with an interesting technique, share it with other YC readers by sending it to us at the magazine. I'll persuade Natalie to pay for contributions used, or even offer a prize for the best! □

NEW RELEASE
EGA GRAPHICS STANDARD



KAYPRO XT/AT. More AT, less money!

The Kaypro XT/AT provides performance and facilities miles ahead of the IBM AT and other compatibles, but costs far less. Don't compromise, buy Kaypro, the quality US manufactured PC with all the extras.

Compare the features and the price with any other AT on the market. An IBM PC/AT with all the Kaypro's options would set you back well over \$12,000.

An added advantage - the Kaypro retains the 8088 processor of the PC. Dual processor (8088/80286) design gives Kaypro complete software compatibility.

20% faster than an IBM/AT

Under Norton Utilities benchmarks the Kaypro comes in at a sizzling 62, as opposed to 52 on the "real" AT. For engineering, big spreadsheet and other power users, this is the machine to beat!

EGA graphics are standard on Kaypro XT/AT, making it perfect for CAD

The superb colour monitor is complemented by "Rolls Royce" EGA colour graphics. With colour resolution of 640x350 pixels, the Kaypro can be used all day in colour mode without eyestrain.

What the competition calls options Kaypro calls standard!

No other AT offers as much as Kaypro. Don't buy a computer that offers less! With Kaypro XT/AT you get the lot.

1. 788KB memory as standard, rather than 640K as provided on other ATs.

2. A 20MB Winchester as standard, rather than a floppy.

3. 4 spare expansion slots standard.

4. 2 spare device slots standard.

5. Serial and parallel ports standard.

6. 6 months warranty is standard. Unlike the 3 months of other ATs.

Software worth over \$1200 is included

• MS-DOS 3.1	• StarIndex
• GW-BASIC	• PolyWindows Desk
• WordStar 3.3	• MITE Communications
• Mailmerge	• DOS users guide
• CorrectStar	• DOS programmer's guide

So if you could really use IBM AT performance, but can't cope with the price tag, call LOGO. We'll sell you something better for around half the price! Act now, prices must rise soon!

Kaypro XT/AT only \$6,750* complete

*Including sales tax, but subject to further currency fluctuations!



LOGO Computer Centre
Suite 303 Henry Lawson Business Centre
Birkenhead Point 2047 Phone (02) 819 6811
WHEN YOU WANT THE BEST

Software Houses

WE NEED YOUR SOLUTIONS

AED System Developments Ltd., manufacturers of the UNIVERSE Supermicro, invite writers of multi-user packages running under: Concurrent DOS, CPM/86, MP/M 86 or MS-DOS to tender their product for evaluation.

AED is expanding, after a successful public float, and looking for software to complement their UNIVERSE Supermicro, in many vertical markets.

We are interested in Supply, Joint Marketing or Dealer arrangements.



FOR THE BEST BOX FOR YOUR BEST SOFTWARE

Contact: Roman Voloshin,
Phone (02) 636 7677
AED System Developments,
P.O. Box 789 Blacktown, NSW 2148



POCKET PROGRAMS

We are always looking for fresh and original Pocket Programs, whether they're useful utilities or for amusement only — or enhanced versions of well-known public domain programs. (Have a look through a few back copies to see the variety we publish.) Check out the Services page under listings for details on style. Payment for programs published is based on length, originality and documentation.

EXPR.C

(A program to evaluate expressions)

EXPR IS AN EXAMPLE of a recursive descent parser. It accepts an arithmetic expression, such as $((9+9)*(4^23))$, parses the expression, evaluates it and returns the value of the expression. This is useful as a stand-alone routine and as a library routine for incorporation into programs.

The grammar (that is, the format of the expressions which can be successfully evaluated) is as follows:

```
expr -> fterm {sign term}
fterm -> sterm | term
term -> sign term
term -> factor {multop factor}
factor -> efact {^ efact}
efact -> number | (expr)
multop -> * | /
sign -> + | -
```

The vertical bar indicates alternatives, and the braces indicate optional parts of the expression.

I have not defined number in the grammar. The function 'number' will evaluate just about any number expressed in standard scientific notation.

This grammar means the power operator (^) has highest precedence, followed by multiplication and division, then addition and subtraction. Parentheses may be used to alter the order of evaluation of expressions. Evaluation of operators is from left to right for operators of the same precedence.

A special case is the null string. If a null string is passed to the parser it will return an error. This error can be tested by the calling program. In some other routines, such as VAL() in BASIC, a value of zero will be returned to the calling program if a null string is passed.

```
/* expr.c
   Parses an arithmetic expression and prints the result
*/

#include "stdio.h"
#include "math.h"
#include "ctype.h"

#define null 0
#define false 0
#define true 1

double parse();
static double expr(), term(), factor(), efact(), number();
/*****
main ()
{
  char buf[80];
  int i, errpos, err, end;
  double lval;

  printf ("Enter expression or <CR> to exit\n");

  end = false;
  while (!end)
  {
    printf ("----> ");
    if (gets (buf) == null || !*buf)
      end = true;
    else
    {
      err = false;
      lval = parse (buf, &err);
      if (err)
      {
        printf ("%e\n", buf);
        errpos = (int)lval;
        for (i = 1; i < errpos; i++)
          printf(" ");
        printf("^\\n");
        switch (err)
        {
          case 1 : printf("No valid number found\\n"); break;
          case 2 : printf("Illegal character\\n"); break;
          case 3 : printf("Missing parenthesis\\n"); break;
          case 4 : printf("Null string entered\\n"); break;
          default : break;
        }
      }
    }
    else
      printf ("%e = %f\n", buf, lval);
  }
}
*****/
```

PRICES SLASHED
FOR A LIMITED TIME ONLY
FROM AS
LOW AS

\$595

BUY DIRECT
FROM TELECORP
VOLUME DISCOUNTS
AVAILABLE



14-DAY TRIAL PERIOD WITH
MONEY BACK GUARANTEE.
ALL MAJOR CREDIT CARDS ACCEPT

TULPI™ INTELLIGENT MODEM™

PLUG IT IN AND LET IT FUNCTION

It's yours with a TULPI.

One compact modem, that delivers data communication you can count on, at a very competitive price.

You don't have to have a technical degree to own a TULPI. Just plug TULPI in and let it go to work.

TULPI makes communications **easier**, there's no switches, talk to your TULPI and other modems, from your terminal; more **powerful**, TULPI can communicate with millions of modems worldwide.

We've built exciting features into the TULPI, to make it the right vehicle, for you to access resources you need, just plug it in.

Once you buy a TULPI it's yours for life.

Because it's built like a computer, you can follow the upgrade path your needs dictate. The TULPI that is right for you today will also be right for tomorrow, as thousands of TULPI owners have found out.

With a TULPI, communicating via computer, will be as second nature as making a phone call.

TO BUY YOUR TULPI FROM TELECORP

PHONE: (02) 450 2522

Tele
CORP™

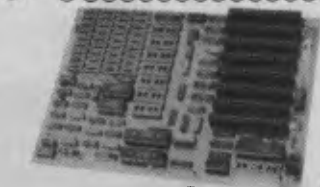
A DIVISION OF
EFTECH LIMITED

26 Tepko Road, Terrey Hills,
NSW 2084, Australia.

The only PC products with a money back guarantee!

14 day money back Guarantee

All PC boards purchased from Electronic Solutions carry a full 14 day money back guarantee. If you are unhappy with any cards purchased from us, just return them in original condition with all packaging, within 14 days, for a full refund.



8MHz TURBO MOTHERBOARD

- 8088-2 running at 8MHz
- Turbo/normal (switch and software selectable) • Full 640K memory installed
- 4 channel DMA
- 8 expansion slots
- Keyboard port

\$450

ENHANCED GRAPHICS/ PRINTER ADAPTOR (EGA)

- Can function as colour graphics, enhanced colour graphics, monochrome display and Hercules graphics card • 256K dynamic RAM screen buffer on-board



- Suits PC, PC/XT, PC/AT and compatibles

\$695



150W SWITCHING POWER SUPPLY

- For PC/XT and compatibles
- Outputs +5V/1.5A -5V/1A +12V/5A -12V/1A

\$136

FLOPPY DISK CONTROLLER



- Controls 4 DS/DD 360KB drives

\$65

SERIAL RS-232 CARD

- Independent receiver clock input
- 2nd serial port optional • Full buffering eliminates need for precise synchronization

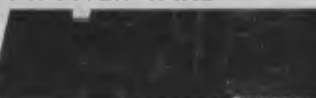
\$55



TURBO SPEEDUP CARD

The old PC a bit too slow? You need our new 286 speedup card. Takes only one expansion slot and boosts performance over 6 times! • Allows PC and PC/XT to run the 80286-8 CPU, as used in the IBM PC/AT • 8088/80286 selectable • 80286 clock rate up to 8MHz • Separate 8088 clock for asynchronous operation • 512KB on board • DMA support • Socket for optional 80287

MONO GRAPHICS/ PRINTER CARD



- Hercules compatible • Interface to TTL monochrome monitor • 1 Centronics parallel port • 2K static, 64K dynamic RAM
- 2 page graphics: 720 x 348 resolution
- 80 characters x 25 lines
- Character box: 9 dots x 14 dots

\$165



I/O PLUS II CARD

- 1 serial port, 1 parallel port
- 1 joystick port
- Clock/calendar with battery backup

\$136



MULTI I/O CARD

- Floppy disk adapter, drives 2 DS/DD floppy drives • 1 serial port (2nd port option) • 1 parallel port, 1 joystick port
- Clock/calendar with battery backup

\$175

1.2MB/360KB FLOPPY CONTROLLER

- Supports both 1.2MB/360KB FDD • Fully PC/XT PC/AT compatible

\$145.00

1.2MB FLOPPY DRIVE

\$285.00

Or buy the pair together and save!

ONLY \$395.00

COLOUR GRAPHICS VIDEO CARD



- Suits RGB and composite colour monitor, TV set or composite monochrome monitor • Light pen interface
- Alphanumeric mode: 40 x 25, 80 x 25 • Hi-res black and white graphics 640 x 200
- Medium-res colour graphics: 320 x 200

\$115



512K RAM CARD

- 512K RAM installed (41256 chips)
- DIP switches to set RAM starting address

\$195

640K UNIVERSAL RAM CARD

- 640K memory installed (uses 4164 and 41256 chips) • User selectable options from 64K to 640K • Uses DIP switch to set RAM starting address

\$225

DISK DRIVES

- 40 track Mitsubishi Drive. Very fast track to track. Lowest price in Australia! SAVE!!

\$245.00

20MB NEC HARD DISK

- Fast and super reliable. Brought to you at a fantastic Electronic Solutions price.

\$845

as above, complete with controller **\$1140**



Still available at lowest prices

- 384K Multi Function card _____ \$295.00
- Colour Graphics/Printer card _____ \$155.00
- Parallel Printer card _____ \$44.00

ELECTRONIC SOLUTIONS

Electronic Solutions. PO Box 426 Gladesville. 2111
Phone (02) 427 4422. We accept both Bankcard and Mastercard.
Mail Orders our speciality. All prices include sales tax.

- We import direct and sell at low margins. You save.
- All products carry a full 3 month warranty
- Full documentation

Compiling the Program

This program has been compiled on an Apple II using Aztec C, and on an NEC APC III using Hi-tech C. The program uses standard K&R C and should compile with any compiler. The stdio and math (floating point) libraries are used.

One possible problem is the way in which carriage return (CR) and line feed (LF) are handled by the compiler. Unix uses LF as a line terminator, Apple DOS 3.3 uses CR and MS-DOS uses CR/LF. Your compiler may use some sort of conversion to try and sort out this confusion, so be prepared to change some of the n and r metasympols in the printf statements.

The program can be used as a standalone utility by compiling it as it stands, or as a library routine by deleting the main routine and compiling to an object file which can be linked in to a calling program. In the latter case it would have to be declared in the calling program as 'double parse()'.
The variable 'str' and the functions called underneath 'parse' are all declared as static, so when compiled as a library function they are not visible. The only function visible to the calling program is 'parse'.

'Str' points at the next character to be processed in the input string. It is global, so all called functions can use it. Most parsers use a special routine to get the next character (or 'token') from the input string. This is a fairly simple parser, so I thought it would be easier if each function did its own token-getting.

The function 'number' is itself useful for evaluating numbers, and could be compiled separately with very little additional work. The 'return' statement at the end of the function contains a quite complex arithmetic expression, and this may cause problems with some compilers — it shouldn't, but you never know...

The function 'number' is itself useful for evaluating numbers, and could be compiled separately with very little additional work. The 'return' statement at the end of the function contains a quite complex arithmetic expression, and this may cause problems with some compilers — it shouldn't, but you never know...

How it Works

The program is a good example of the power of recursion as a simple means of evaluating complex expressions.

```

/*****
static char *str;
/*****
double parse (expression, err)

char *expression;
int *err;

{
double rval;

if (*expression == null) {
    *err = 4;
    return (1);
}
removespaces(expression);
str = expression;
rval = expr(err);
if (!(*err) && *str != null) /* parsing aborted by error char */
    *err = 2;
if (*err)
    return (str -_expression + 1);
else
    return (rval);
}
/*****
static double expr(err)
int *err;

/* evaluate :
expr -> fterm ( sign term )
fterm -> sterm ; term
sterm -> sign term
*/

{
double lval;
int sign;

switch (*str)
{
case '+' : sign = 1; str++; break;
case '-' : sign = -1; str++; break;
default : sign = 1; break;
}

lval = sign * term (err);
if (*err)
    return (0);
while (*str == '+' || *str == '-')
{
switch (*str)
{
case '+' : str++; lval += term (err); break;
case '-' : str++; lval -= term (err); break;
default : break;
}

if (*err)
    return (0);
}
return (lval);
}

```

The main routine passes to parse a pointer to a buffer containing the expression to be evaluated, and a pointer to an error flag. The address of the error flag is passed down all the routines in the program and is tested at each level. The computed value of the parse string is returned, unless an error is detected when the position (first character of the expression = 1) of the illegal character is returned.

A value of zero in the error flag indicates no error. A value of -1 = no valid number found, 2 = illegal character detected, 3 = missing parenthesis, and 4 = null string.

In this program I have tested the case statement for the return of a null string error, but in practise an error will never occur because this has already been used as the test for termination of the program. I put it in to demonstrate how it might be done.

The function parse tests for the special case of a null string, removes white space from the string, then calls expr to start the hard work. When expr returns, parse returns the appropriate value to the calling routine.

To demonstrate how it works I will show how the program handles the two strings '1' and '(1+2)'.
 The main routine accepts the string '1' and passes its address (the pointer 'buf' — don't forget that an array variable is treated by C as a pointer) to parse, along with the address of the error flag. Parse removes the spaces (there aren't any in this case) and calls expr. Expr doesn't find a sign, so assumes the expression is positive, and calls term. Term calls factor immediately, to evaluate the first part of the expression — it doesn't know yet that there is no multop for it to evaluate. Similarly, factor calls efact, which has to decide whether to call the number function or to recurse back to expr. In this case it calls number, which figures out that the string '1' has a value of 1. By this time, str is pointing at the null character marking the end of the input string. The value 1 is then returned back through efact,

```

/*****/

static double term (err)

int *err;

/* evaluate :
term -> factor { multop factor }
*/

{
double lval, rval;

lval = factor (err);
if (*err)
return (0);
while (*str == '*' || *str == '/')
{
switch (*str)
{
case '*' : str++;
rval = factor (err);
if (*err)
return (0);
lval *= rval;
break;

case '/' : str++;
rval = factor (err);
if (*err)
return (0);
lval /= rval;
break;

default : break;
}
}
return (lval);
}

/*****/

static double factor(err)

int *err;

/* evaluate :
factor -> efact { ^ efact }
*/

{
double lval, rval;

lval = efact (err);
if (*err)
return (0);
while (*str == '^')
{
str++;
rval = efact (err);
if (*err)
return (0);
lval = pow (lval, rval);
}
return (lval);
}

```

factor, term and expr, which check that the character being pointed at is nothing to do with them. Parse accepts this value and checks that the end of string has indeed been reached. It then passes the value back to main, which prints the value on the terminal and asks for the next string.

With the string '(1+2)', events proceed similarly until control reaches `efact`. `Efact` finds a '(' and calls `expr` to evaluate what we know is the expression '1+2'. The first character of this expression is '1', so evaluation proceeds as in the previous example, with control passing down through `term`, `factor`, `efact` and `number`, which returns 1, then back through `efact`, `factor` and `term` until control returns to `expr`. `Expr` sees that the next character is a '+', so it again goes through the same sequence to evaluate '2'. `Expr` adds the values 1 and 2, and returns the result of 3 to its calling routine, which is `efact`. `Efact` checks for the closing parenthesis and control passes back up the sequence to parse, which checks for end of string and returns control to main.

It's easy to see why this is called a recursive descent parser. A simple string went down the series of functions three times before a result was returned. In fact, the sequence occurs once for every number and every pair of parentheses in the expression to be evaluated, and the parentheses generate a recursive call each time.

If you want more information on the techniques used here, a good reference is Aho and Ullman's text *Principles of Compiler Design*.

Peter Greenacre,
Camperdown, NSW.

```

/*****/
static double efact(err)

int *err;

/* evaluate :
efact -> number : (expr)
*/

{
double lval;

if (*str == '(')
{
str++;
lval = expr (err);
if (*err)
return (0);
if (*str == ')')
str++;
else
{
*err = 3;
return (0);
}
}
else
{
lval = number (err);
if (*err)
return (0);
}
return (lval);
}

/*****/
static double number(err)

int *err;

{
double sign = 1; /* sign of number */
double numpart = 0; /* number part */
double nfrac = 0; /* number of digits in frac part */
double esign = 1; /* sign of exponent */
double epart = 0; /* exp part */
int numfound = false; /* to test if a valid number has been found */

/* get optional leading sign */
switch (*str)
{
case '+' : sign = 1; str++; break;
case '-' : sign = -1; str++; break;
default : sign = 1; break;
}

/* get the whole part */
while (*str && isdigit(*str))
{
numpart = (numpart * 10) + (*str - '0');
numfound = true;
str++;
}
}

```

POCKET PROGRAMS

```

/* if dp found get frac part */
if (*str == '.')
{
    str++;
    while (*str && isdigit(*str))
    {
        /* continue to get the numeric part */
        numpart = (numpart * 10) + (*str - '0');
        numfound = true;
        str++;
        nfrac++;
    }
}

/* check now for a valid number */
if (!numfound)
{
    *err = 1;
    return(0);
}

/* if 'e' found get epart */
if (*str == 'e' || *str == 'E')
{
    str++;
    /* get optional leading sign of epart */
    switch (*str)
    {
        case '+': esign = 1; str++; break;
        case '-': esign = -1; str++; break;
    }
}

```

```

        default : esign = 1; break;
    }
    while (*str && isdigit(*str))
    {
        epart = (epart * 10) + (*str - '0');
        str++;
    }
}

/* put the whole lot together */
return (sign * numpart * pow(10.0, (esign * epart) - nfrac));
}

/*****

static int removespaces(sp)
    /* remove white space from the string pointed to by sp */

char *sp;

{
    char *np; /* points at the end of the crunched string */

    np = sp;
    while (*sp != null)
    {
        if (*sp != ' ' && *sp != '\t')
        {
            *np = *sp;
            np++;
        }
        sp++;
    }
    *np = null;
}

*****/

```

FREE

from
Australia's largest computer mail order company.
MICRO-EDUCATIONAL P/L
8/235 Darby St NEWCASTLE 2300

OUR LATEST LIBRARY DISK FOR YOUR **APPLE, IBM, or MAC**

(Add \$10 for Mac 3.5" disks) These disks contain the best in public domain software. Send 6 x 36c stamps to cover post.

Dear George,

Please rush me a free library disk for my IBM/APPLE/MAC
(Add \$10 for Mac disks. Enclosed please find 6 x 36c stamps.

NAME: _____

ADDRESS: _____

P/CODE: _____

KEEPING THE 8-BIT CP/M HOUSE IN ORDER



I HAVE A PASSION for programs that poke themselves away in corners of my computer's memory ready for instant service whenever I need them. It's like having a squad of servants at my beck and call.

In a back room, behind my (16-bit) word processing secretary, I keep my clock man, note-taking maid and keyboard engineer. The clock man rushes out every hour and beeps at me. The maid and engineer *never* go off for tea breaks. They are always there whenever I press the key that summons them.

However, they do have a dreadful appetite and are quite fat. If I packed all my (16-bit memory-resident) servants in at once, they would fill over 200 Kbytes of memory. As I also have a penchant for setting aside part of my house for use as an ultra-fast RAM disk, my 16-bit servants are mostly confined to living out in the garage, with only the slimmest and most versatile ones allowed a permanent room in the manor.

Now anyone would think that the 'humble' 8-bit computer, which usually has a mere gardener's cottage of 64 Kbytes, only one-tenth the size of a 16-bit mansion, would have no room at all for live-in servants.

Have Hired Help will Budget

But necessity is the mother of invention. There are hundreds of thousands of sturdy

8-bit machines out there with many of the owners begging for mini-servants to look after them. So a Mr Bomberger, who lives over in California, has started a company called 'Poor People's Software'. He sells collections of dwarf servants

One of Jan Roberts' favourite things is having lots of memory-resident programs to call on for assistance. Write-Hand Man has achieved permanent residency in the back room of Jan's Bee bringing with it a staff of poor people's servants — they don't eat much and never take a break.

that can live below the stairs in any 8-bit CP/M-style cottage — these can even live in the more uppity ZCPR2-type renovated-CP/M cottages, such as the Microbee.

His (desktop-sized) servants are a real wonder. The butler, known as 'Write-Hand Man', is only 1.5 Kbytes in size. When you summon him by pressing the key you have designated, he appears instantly, right in the middle of your document or spreadsheet, and asks what other servants you require. He has a dozen at his beck and call.

There's the Notepad. This is a very efficient secretary, who automatically adds pages to her notebook as you need them — so you can make as many notes as will fit onto the disk on which she normally lives.

In her notebook you can 'Flip from page to page forwards or 'Backwards, insert or overwrite, or delete either a character or a page at a time. You can 'Jump to any page you wish.

By default, the Notebook takes up the top-left portion of the screen — but you can tell her to go elsewhere.

Programmers:

Turbo-charge your productivity with PL/PC

(Programming language for the PC)

3-5 times more productive than using conventional languages.

Full APL array operators (including matrix inversion and FFT).

Integrated Programming Environment.

Modern control and subroutine structure.

Local subroutines and variables.

More than 130 built in mathematical and graphics subroutines.

One conceptual numeric type (including complex numbers).

Large memory model.

Source-level debugging.

Auto-paragraphing.

Built-in full-screen text and data editor.

Virtual file variable of up to disk capacity.

Local support via fax, phone and mail.

See quick reference guide
on page 12 of November
Your Computer

For only \$159
Demo version \$16

Requirements:
IBM PC or compatibles
DOS 2.11 or higher
360K bytes memory

Creative Computer Software

117 York St., Sydney, NSW 2000
Phone: (02) 261 1611
Fax: (02) 264 7161



The Complete Graphics, Typesetting & LaserPrinting Service

Now with Linotronic 100

We're having a double celebration!!

The Creative Computer Company is **one year old** and we have a **new Head Office**, located at 117 York Street, Sydney, where the Linotronic 100 Typesetting machine is available, so we can now print at four times the LaserWriter resolution, meaning high quality artwork in minimum time at minimum cost.

Important Documents, Business Reports, Manuals, Advertising Brochures etc., can be downloaded to our Macintosh machines, for quality typesetting, direct from your CPM/MS-DOS word processing files. We can fax you a copy of the finished artwork, for proofreading usually within 24 hours, saving you unnecessary trips to our office. So call in soon to find out what a difference creativity and the latest technology can make!

The

Creative Computer Company

CITY: 117 York Street, Sydney, N.S.W. 2000 Tel: 261 1611 Fax: 264 7161
HURSTVILLE: 123 Forest Road, Hurstville, N.S.W. 2220 Tel: 570 8300 Fax: 570 9873

WRITE-HAND MAN

She will rush off and save your notes safely onto disk as soon as you give her permission to go (by pressing Escape). She's up with things modern: you can 'Cut notes out and put them onto a function key so they can be moved to other documents or to a calculator — she doesn't have a great memory for these notes, but more about this latter.

You can also toggle the printer on and off and thus get an immediate hard copy of her notes. She's extremely efficient for so petite a person — under 2 Kbytes.

RELatively Speaking

All the servants (apart from the butler) are known as REL programs, and none are bigger than 2 Kbytes in size. They do, however, operate different-sized data tools, known as DAT files; the notepad's dat file, for example, grows in size as you use it.

Then there's the telephone clerk, known as the Phonebook, which comes in two sizes (one is a 'gigantic' 20 Kbytes). You can page through the book, or summon any group of names by their first letter. As with the notebook, basic Wordstar editing commands are utilised to enter text. If you really want to update your communications, the Phonebook can arrange to send any selected telephone number automatically to your modem — but you must have a 'smartmodem' for this to be of any use.

The dat files of this troupe of helpers only come into memory as required — and if (and only if) any alterations are made they are immediately saved to disk when you finish with them.

As I mentioned before, it's only the 1.5 Kbyte butler that sits in memory all the time, and he also requires another 1.5 Kbytes, to give him some elbow room into which to load servants (applications). He will always go out and look for the servants both on the default drive and the A: drive (though I have found he is sometimes reluctant to go from a RAM drive to

All the servants (apart from the butler) are known as REL programs, and none are bigger than 2 Kbytes in size. They do, however, operate different-sized data tools, known as DAT files; the notepad's dat file, for example, grows in size as you use it.

look at the A: drive.)

There are lots more servants on the butler's roll-call yet.

Many Hands Make Light Work

The appointments secretary (Calendar) keeps records two weeks in advance (okay, 16-bit calendar's have an elephantine memory — but they're sized like elephants, too). As you finish with one week, the next week's appointments become the current batch and a new blank week's diary appears for the following week.

Then there's the parking attendant, good old DIR, who manages the directories. The directory of any drive can be given on request, including those of specified user areas — they can even sorted by wildcard.

The librarian allows you to VIEW any document on request, giving programs such as Wordstar a windowing ability. You can't edit the documents you view, but the Librarian does have a magic pair of scissors: lines can either be truncated to allow

for fast scrolling, or wrapped around to allow all words to be read. You can zip to the last page, back to the first, even set how many lines forwards or backwards you want to move each time you scroll. The magic scissors will also allow you to 'Cut a selected part of the document to function key one, and to then PASTE this into the notepad or any other document. Only three lines of characters at a time can be moved using this method — short servants have short memories.

The accountant, Calculate, is pretty basic, but it has some useful functions. It has a floating point and takes numbers of up to 14 digits. It has memory — but only for one number at a time. The result of the calculation can be 'Cut to function key 8, and thus be shifted into your work document or into Write-Hand Man's Notepad.

The final regular staff member is Ms. Key, who manages the household. She can program the number keys on the keyboard to perform any number of tasks — you chose (and can constantly change) a character to act as a 'trigger' or 'Alt' key, to change the number keys from humdrum numbers to programmable function keys.

The function keys are humble; they can only remember up to 15 characters each, which is enough for most control sequences, but very little if you are moving text. However, if you request more than 15 characters to be saved, the other function keys' memories will be utilised to save up to a maximum of 95 characters (linked to function key 1, so you only have to press '1' to recall them). You can reload the previously loaded set of Functions onto the keys with a simple Control 'O', for 'old' command. The function keys are best used for control sequences, addresses, formulae and numbers, rather than for general text.

However, if you want to store more on a key, you can use Smartkey (though not

```
Write-Hand-Man |
Enter Choice [ ] |
A - Notepad |
B - Phonebook |
C - Calendar |
D - Dir |
E - View |
F - Calculate |
G - Keys |
O - Other |
-----|
```

Figure 1. WHM's Selection Menu appears in the upper left of the screen when the (user defined) call-up key is pressed.

```
S - Begin at START of file
E - Go to END of file
F - Scroll forward ONE block
B - " backward " "
+n - " forward "n" blocks. n ranges from 0 to 9
-n - " backward " " " " 0 to 9
T - toggle the TRUNCATE flag. The last character of the window
indicates the truncate mode.
If "I" is visible, then the lines are being wrapped.
If "T" is visible, then the records are being truncated.
A change takes effect when the next block is displayed.
C - Cut function, see below.
<ESC> - Return to file name prompt
```

Figure 2. The files selected with WHM's VIEW are displayed in 128-byte blocks — the options are shown above.

WRITE-HAND MAN

with the enhanced 8-bit Microbee system) or Qwikkey or Flashprint!! alongside Write-Hand Man. When I use Wordstar, I commonly have Write-Hand Man, Qwikkey and Flashprint!! tucked into memory alongside Wordstar. The combination of all four programs is incredibly useful. I have about 300 function keys available!

The Others

There are still more servants — but they stowaway under the final menu item of 'Other', which, when chosen, will prompt you for a filename to summon one of the following inflatable servants —

- There's another calculator which can toggle between decimal and hex.
- An ASCII listing.
- The powerful Wizard known as 'SWAP', allows you to run another program without exiting from the first. It does this by saving nearly the whole contents of memory onto disk and then reloading it after the chosen program has run. Thus you must have at least 50 Kbytes free on

the default disk if you intend to use this utility — even if the program you are running is relatively small. SWAP is surrounded with cautions. Most importantly, you're warned about changing the directory of the disk; if you move or delete a program or part of a program which is required by your first program, when you return to it, it could well crash.

For Megalomaniacs

And if this mob of servants is not enough for you, Write-Hand Man — WHM to his friends — is supplied with instructions on how to use a relocatable assembler, to turn any of your favourite programs into a REL form that can be called up under WHM. A partially prepared telecommunications program is also provided, which only requires fine-tuning to meet your particular needs.

Write-Hand Man is not copy protected. It even comes with MAC files, to allow programming freaks to pry into its workings

and make changes if desired. It doesn't have fancy graphics, but it is one of the neatest bits of programming around. I wish 16-bit programmers would take note. Many of their programs spread luxuriously through oceans of computer memory, making operations painfully slow if you haven't a hard disk.

WHM will run on most CP/M machines, including any 8-bit (ZCPR) disk Microbee (but Microbee owners must quit their Shell program to run WHM), Apples with CP/M, and with most implementations of CP/M Plus. I have tested it with Wordstar and dBase II without problems, and ran Qwikkey at the same time.

I think this must take the prize for the neatest, most useful and versatile, tiny program available. It is distributed in Australia by Glyphic Software, PO Box 391, Pennant Hills 2120, and costs \$45 (including tax and postage). It is supplied in most CP/M formats, including Microbee (both disk sizes), Kaypro 2, Morrow Decision, Osborne DD and TRS-80. □

FTL MODULA-2 \$100

You've probably heard of Modula-2, Niklaus Wirth's newest language: It's now available for a range of machines from JED Microprocessors. This implementation was written in Australia, and is being sold world-wide. Jerry Pournelle in Byte, (April '86) loved it: now it's available for MS-DOS systems as well as CP/M Z-80 systems, with 68000 based versions in the mill.

It contains an integrated full-screen editor with fast compilation and linking from libraries, which makes it more powerful than Turbo-P., and much easier to use on large programs. You get 1 meg of software on three full disks, with full sources of the editor and many other modules and utilities. It produces fast, PROM-able code which closely follows Wirth's third edition, with 8087 and LONG support.

MTBASIC Multitasking BASIC Compiler \$125

MTBASIC is an easy to use BASIC which allows interactive program writing and checkout, followed by easy production of a PROM-able COM file on disk. The multi-tasking allows time or interrupt task switching, ideal for process control where operator I/O and communication occurs while the control work goes on. (MT8087 \$160)

Both compilers are available for MS-DOS (IBM, APC, etc) and CP/M-Z80 (Microbee, Osborne, Kaypro and 8" SSSD).

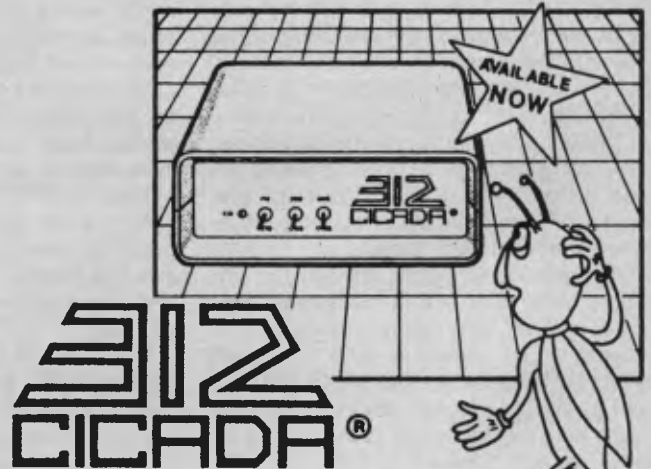
Phone (03) 762 3588 to order (VISA, B/C, Cheque OK), or to receive a copy of JED's 30-page catalogue of STD-bus CMOS single board computers for data logging or control.

JED

**JED MICROPROCESSORS
PTY. LTD.**

Office: 7, 5-7 Chandler Rd,
(P.O. Box 30), Boronia, 3155
VICTORIA, AUSTRALIA

(03) 762 3588 (02) 467 2032 (07) 369 5900 (08) 46 8531 (002) 234 3888



The new VIATEL-MODEM with all the legendary Performance and Reliability of the CICADA 300 series. Fully Telecom approved. Approval No. C85/3D37/1358



CENTRE INDUSTRIES

**ELECTRONICS &
TELECOMMUNICATIONS
EXPERTISE**



187 Allambie Road, Allambie Heights, NSW 2100
Telephone (02) 451 5555 After Hours (02) 451 6244
Telex AA 22671

® CICADA is the registered Trade Name of CENTRE INDUSTRIES

FONTASTIC Results from our New Packages.

TCF COMPUTER SYSTEMS PTY LTD

214 HARBORD ROAD BROOKVALE (02) 938-2522



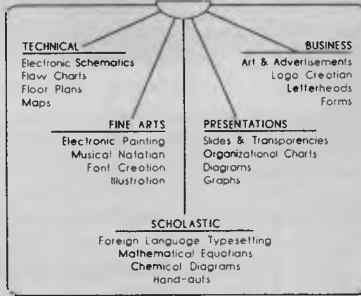
Desktop Publishing

With your IBM-PC, XT, AT or compatible

FONTRIX is a screen based, visual editor of text and pictures. Its fonts and graphics are displayed on-screen exactly as they will appear in print. Perfectly suited for complex page layouts and technical drawings, **FONTRIX** gives you a high resolution "electronic page", a workspace up to 115 times the size of a single screen. The wealth of drawing and painting tools, enormous work area, electronic cut-and-paste, font editor, mouse interface and other fine features

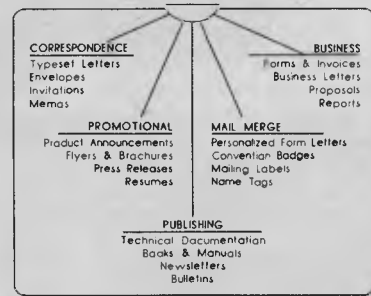
PRINTRIX is an automated batch processor of textfiles. As such, it accepts both standard ASCII and native textfiles from most major word processors, adding fonts, page formatting and graphic insertions to print camera-ready output on your printer. A great range of features, like proportionally spaced fonts, variable form size, even automatic mail merge let **PRINTRIX** typeset everything from mailing labels to thousand-page documents.

FONTRIX



\$395

PRINTRIX



\$325



TCF GENERAL ACCOUNTING \$ 795

This package was built to Australian Accountancy Standards, to be used by Accountants or Business People to maintain a full set of books. Full reporting including Corporate Affairs, Directors, and all Audit Trails.

BASIC MANAGEMENT SYSTEMS \$ 1495

Fully Integrated Open Item Accounting System, Debtors, Creditors, General Ledger, Stock Control with Backorder system, Alpha sort, Central Billing, Sales Areas, Commissions and many other reports. (Australian Package).

BUSINESS MANAGER \$ 625

Standard Integrated Business Package, Debtors, Creditors, General Ledger, Stock Control, thousands sold. (Australian Package).

ESSENTIAL GRAPHICS for C \$ 475

Over 150 Graphic Functions plus range of Text Fonts, Available in Libraries for Lattice, Microsoft, DeSmet, Astec & Computer Innovations C Compilers, Supports IBM CGA, Hercules, & EGA. Compatible with Fontasy & Fontrix.

C UTILITY LIBRARY \$ 375

By Essential Software, over 300 functions. Available in Libraries for Lattice, Microsoft, DeSmet, Aztec, and Computer Innovations Compilers. Includes Source Code, why re-invent the wheel?

INTRODUCING C \$ 325

Interactive C language training system complete with C Interpreter, Full Screen Editor, and Full Colour Graphic capabilities for IBM XT, AT. The fastest easiest way to learn C. The reference section is designed as an inclusive aid for both beginner and experienced programmer.

DESMET C COMPILER \$ 320

C Programmers Development System, Includes Assembler, Debugger & Link.

MABEL (shopstock) \$ 1150

Stock Control with Bar Coding, to suit Retail Point of Sale or Warehousing, large Selection of reports, including Dockets Invoices, Sales Performance, Stock Movement, Prints Bar Labels.

TMAKER INTEGRATED \$ 650

The only fully integrated software suite to run on CP/M, MSDOS PCDOS, CP/M86, With transferable data path. Wordprocessing, Database Spreadsheet, Spelling Checker, Bar Graphs, List Processor, Mail Merge Proof Reader, Dictionary, Help Menus, Excellent manual (in English).

TMASER \$ 775

A new package from Tmaker, runs on PCDOS only, a very large single file capacities up to 525k, Conditional rules in the spreadsheet, full pull down menu driven. With all the features of Tmaker, one of the most powerful integrated packages in the world, now in Colour.

PERSONAL PUBLISHER \$ 395

Also from Tmaker, the company that produced the desktop publishing modules for the McIntosh. Allows mouse or keyboard control, Page Graphics and Publishing, Multi Column, Cut and Paste, Picture Wrap, Large Font Range, Laser Version available, Additional Image packs available, handles Imports.

PCNX \$ 198

PC Operating System that gives you a UNIX environment. Includes popular Bourne shell, Multiuser, Multitasking, 100% compatible with MSDOS file systems, use existing MSDOS compilers, editors & linkers. Uses less than 512k, source code included. suit IBM PC, XT, AT and full compatibles.

OPERATING SYSTEM TOOLBOX \$ 198

PC Operating System Construction Set, you can build your own Multitasking Multiuser Op/System. Port Mainframe system to PC's, 100% compatible with MSDOS file system, Source code supplied. suit IBM PC, XT, AT and Compat.

Queensland Distributor: Gumtree Computers Pty Ltd
14a Brisbane St. Ipswich (07) 202-3866

APC IV ME



The company which for some time successfully stuck out its NEC and defied the IBM-compatible urge has succumbed — with style. The APC IV is all Rose

Vines could have wished IV, from its all-bells-and-whistles monitor, to its self-assured, businesslike keyboard.

FOR YEARS, NEC has profited from its policy of splendid isolation; shunning the safe but dreary world of IBM compatibility, the company has carved out a good-sized niche in the Australian microcomputer market with its excellent MS-DOS-based machines.

Signs that this isolationism was beginning to crumble appeared last year, when the company announced the Software Library Expander for the APC III. The SLE enabled that machine to run almost all IBM PC software. Now, with the introduc-

tion of its APC IV, NEC has leapt headlong into the maelstrom of compatibility. And, of course, has done it with style.

An AT IV NEC

Not bothering with producing anything as boring as a straight PC compatible, NEC has come in at the top end of the scale and produced an IBM AT compatible. And it's a heavyweight: the APC IV comes in three configurations, with the entry-level system containing 640 Kbytes of RAM, one 1.2 Mbyte floppy disk drive, a 40 Mbyte hard disk, an IBM CGA-compatible, colour graphics card, and an Advanced Graphics

Colour Monitor with 800 by 560-pixel resolution.

Taking a look inside the APC IV involves undoing five screws and removing the top of the system unit; that's five screws too many as far as I'm concerned — why not a simple catch as on some other machines? Or, better still, a set-up like on the Ferranti 2860, which lets you get at the expansion slots without even taking the monitor off the system unit. No big deal, perhaps, but frustrating, especially if you don't have a Philips-head screwdriver on hand.

Inside, boards, cables, drives and power

supply are fairly tightly packed. The 40 Mbyte hard disk takes the same amount of space as the half-height 1.2 Mbyte floppy, with room for another of each. There's space on the motherboard for an 80287 maths co-processor (the main processor is the 8 MHz 80286-8). Of the eight expansion slots, three (one short and two long) are already occupied by the disk controller, a memory board (1 Mbyte of extended memory) and the colour graphics card. Everything is solidly built, with the exception of the battery pack for the internal clock, which is stuck onto the rear inside of the unit with Velcro.

The array of connectors at the back of the machine includes two serial ports, one parallel printer port, a DIN socket for the keyboard, a mains input and a mains output, and the monitor connectors on the graphics card. The front of the machine has a key-operated lock/unlock/reset switch, LEDs indicating power-on and disk activity, and, tucked away at the bottom left, a switch for changing the processor speed from 6 MHz (fully IBM compatible) to 8 MHz. Changing processor speed also requires resetting the machine — so don't try doing it while in the middle of processing; if you do, the machine will hang and you'll lose your data.

The keyboard is not quite as flash as the APC III's, but I found it very relaxing to use. It's similar to the IBM AT standard, with LEDs indicating caps-, num- and scroll-lock, an enlarged enter key, function keys grouped at the left, and cursor keys incorporated in the numeric keypad. It has adjustable legs (which stay adjusted — not all of them do!) and a delightfully long, coiled cable linking it to the system unit. The keys feel light and distinct.

The monitor is excellent, with an aircraft-like array of knobs and switches to control it. (See the accompanying box for more on the monitor.) At the top of the monitor are controls for vertical hold, size and position; horizontal position and width; brightness; contrast; and text mode (which gives you monochrome, in a choice of colours). The particular colour of monochrome you desire is chosen by adjusting the RGB dip switches at the rear of the monitor, which also provide control over the number of colours (8, 16 or 64) you get when out of text mode. Also round the back is the power switch, a TTL (transistor-to-transistor logic)/Analog switch for selecting the type of RGB input you require, and a Manual switch which, I think, provides a choice between the colour setting

Overall, the hardware design is first-rate. Instead of the usual piercing drone of most AT clones, the APC IV has a less intrusive and more reassuring bass rumble, and everything functions smoothly and with precision.

on the dip switches and the default setting for the monitor. I say "I think" because I wasn't supplied with a manual for the monitor, and you definitely need one.

The excellent resolution of the monitor is not put to proper use by the CGA card supplied, but the next machine up in the APC IV line comes with an EGA-compatible card. Even so, the stability of the output in combination with the tilt-and-swivel stand, made this monitor a pleasure to use.

Overall, the hardware design is first-rate. Instead of the usual piercing drone of most AT clones, the APC IV has a less intrusive and more reassuring bass rumble, and everything functions smoothly and with precision. Matt Whelan speed tested the machine against the other AT compatibles (see the November 1986 issue of *Your Computer* for details) and found it ranked well up the scale.

Software — IV Whom the Machine Tolls

As the APC IV is NEC's first outing into IBM compatibility, the company went straight to Phoenix for its BIOS (Basic Input/Output System). Phoenix supplies IBM-compatible BIOSes to many of the clone makers, and does an excellent job walking the tightrope between as-good-as-complete, legal compatibility, and actually complete, copyright-infringing compatibility.

The APC IV I reviewed came with MS-DOS 3.1. In addition to the standard Microsoft DOS features, NEC has provided a few of its own. SIZE gives you the total number of bytes in a set of files — a feature I've regularly missed since losing the

SDIR command of CP/M. Among other things, it provides an easy way of checking whether a group of files will fit on a disk.

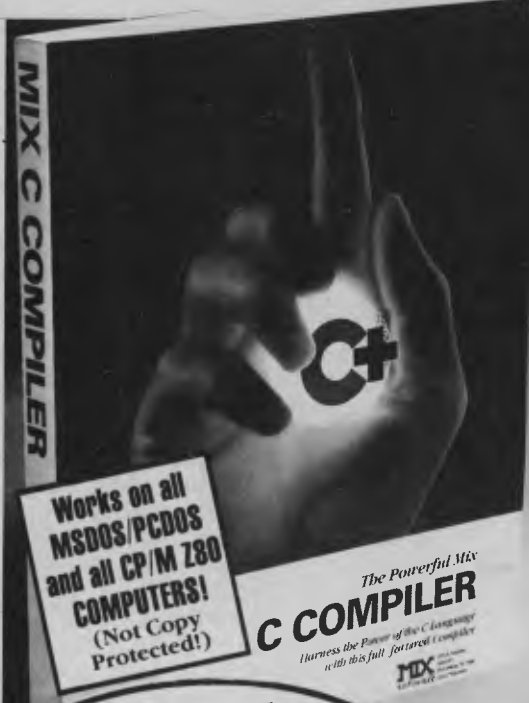
CHMOD is a souped-up version of ATTRIB, which lets you view and alter file attributes including read-only status, archive status, and hidden or directory status. XASSIGN performs the same function as ASSIGN (routing calls from one drive to another), as well as routing calls for a specific file to a different path or drive. Your Wordstar overlays will no longer have to appear all over the place.

XTREE displays all sub-directories and, if desired, all files within the current directory; more importantly, the /D/Q option lets you use XTREE to delete specified files, with DOS checking it's okay to continue before each deletion. This is great if you have 17 files with names such as FRED.001, FRED.002, and so on, and you want to delete nine of the files. Instead of having to issue 17 DEL commands, or renaming the files you want to save, you just type XTREE FRED.* /D/Q and answer the prompts.

There are other NEC-designed commands, but most of them are standard 'custom-designed' fare. Except, perhaps, CRTDUMP, which lets you dump the contents of the screen to a NEC printer — including colour (with the the right hardware).

A comment on the relationship between the hardware and the operating system: the hardware has definitely outgrown the software. While the standard hard-disk size on the APC IV is 40 Mbytes, MS-DOS can only count up to 32. This doesn't mean you can't use all your disk space, but the maximum size you can set aside for a logical drive is 32 Mbytes. Thus, the review machine came with floppy drive a: (it will also answer to b:), and the hard disk divided into a 32 Mbyte drive c: and an 8 MByte drive d:. I have visions of little Microsoft gnomes working throughout the nights, trying to produce MS-DOS 5.0 or 23.7, or whichever version is supposed to start using the power and storage of the current wave of machines, let alone the fearsome powers of the 80386 mob Compaq is already leading into the fray.

On the applications front, I tried all sorts of things on the APC IV and couldn't get it to falter. Memory-resident utilities which have stumped some of the other AT clones ran perfectly. Flight Simulator, which was rumoured to cause the NEC problems, performed perfectly (that is, I crashed when I should). The only thing I



C FEVER *catch it!*

It's becoming an epidemic . . . everyone is switching to C!

It's time to face the inevitable. You're going to catch the fever too! When you do, give us a call. We've got the best cure — an illustrated guide to the C language, plus a complete program development system. Everything you need to master the C programming language . . . all at a price that's less than the cost of a book!

But don't let this price fool you. Our system is powerful; it compiles twice as fast as the others, is completely standard, and it's very easy to use. Most C compilers are designed for wizards. We have designed ours for you!

What do you get for a mere \$89.95

- A 450 Page book filled with sample programs, plus . . .
- A fast, standard, full featured C compiler that supports all data types and the latest features like bit fields, enumerations, structure assignment, and passing/returning structures.
- A fast linker that loads separately compiled files, searches libraries, and builds an executable program.
- An extensive library of more than 170 functions (including the standard C functions and the computer specific functions that provide direct access to the operating system and BIOS).
- Tools that allow you to optimize your programs for minimal space or maximum speed.

Works on all
MSDOS/PCDOS
and all CP/M Z80
COMPUTERS!
(Not Copy
Protected!)

The Powerful Mix
C COMPILER
Harness the Power of the C language
with this full featured compiler

Incredible Value
\$89⁹⁵ only
Full C Compiler

Split Screen Text Editor

Edit two files at the same time, use macros to have your own custom editor. For CPM and MS DOS (additional features for MS DOS). Only \$65.90



Limited Time
\$129⁹⁰ only
C & Editor

Updates \$20.00

ASM Utility
Call assembly language routines from your C programs. Works with MASM or M80 assembler. Form libraries from your special assembly language routines. Only \$23.00

MIX Products are Licensed and Distributed by
TECHFLOW PTY Limited, P.O. Box 4,
WOODFORD 2778. TLX 71333 TECFLO
Bankcard and Mastercard welcome \$4.00
post/pack on each order PHONE (047) 58-6924

Large Memory Model extension program and Ctrace for MIX C coming

PC PROMISE

- * Rated best buy in Databases by "Which Computer" August 1986.
- * Designed for PC1512. Runs on any Compatible.

THE NEW STANDARD IN RELATIONAL DATABASE MANAGEMENT SYSTEMS

Promise is FAST...VERY FAST. Selects 20 records in 25 seconds
 Promise is compatible with W/Star, d BASE, Lotus 123 & Ascii files
 Promise is linked Files up to 4 levels deep in relational format
 Promise is Windows & Screens. Design your own. Link screens.
 Promise is extremely flexible. Up to 250 fields per record.
 Promise is 4 files open at once. Can all be linked together.
 Promise is 32000 records in each file. Have many files.
 Promise is online help screens. Design your own!
 Promise is up to 16 field index and 48 characters
 Promise is Password protected- 5 levels. Your eyes only & others
 Promise is colour or mono. 16 colours or shades of grey.
 Promise is Menu driven. Design your own. Link together.
 Promise is able to add or delete fields without re-writing file.

To AMSNET International Pty. Ltd (UK & Aust)
 49 Riversdale Rd
 OXFENFORD Q 4210 Phone 075-531734.
 Telex AA43470 COWENS

Please send copies of PC Promise on IBM 5.25" disc
 Send information only on PC Promise to

Name Ph.....

Address

City/Town Postcode

Cash/Cheque for \$ enc. Bill my B/card, M/card, Visacard

No. Exp. Date.../.../...

Signed

from
THE PEOPLE-SERVING-PEOPLE MARKETING NETWORK
 YOU'RE ON A PROMISE. Send us your \$250 now and try PC Promise. If you are not completely satisfied within 14 days, return the entire package in as new condition and we promise to refund your \$250 less a \$5 handling charge.....and.....THAT'S A PROMISE!

didn't get to try was a Softguard-protected program; Softguard seems to stop many otherwise compatible machines in their tracks, making it impossible to use such programs as dBase III Plus. As Ashton-Tate has announced the release of uncopy-protected dBase (at last), I'm not too fussed about this anymore. If you're worried about it, take along some copy-protected software when you check out your prospective machine (and remember to uninstall it before you leave!).

Earlier models of the APC have gained wide acceptance in the computer-aided-design market, based on the machines' high resolution graphics combined with Autocad software. The APC IV — with its excellent colour monitor — should help NEC retain its footing in this market. While the entry-level machine is fairly impressive itself, two higher-level configurations provide even more graphics power: the APC IV/AG (Advanced Graphics) adds an IBM Extended Graphics Adaptor (EGA) compatible board, and the APC IV/PG (Power Graphics) comes with a Power Graphics card and display, providing 1120 by 750-pixel resolution. It's also possible to put an IBM Professional Graphics Adaptor into the AG model.

Documentation — IV Shame, IV Shame

Oh well, I guess there had to be something to complain about! The documentation I received was the pre-release version of the DOS manual. It's slack. NEC has done its old trick of using Microsoft's original documentation for MS-DOS and then adding a separate section with the NEC DOS utilities and enhanced utilities. This means you're never quite sure where the information you want is located, and sometimes there are two versions of information on the same command. If you're going to produce a machine as good as the APC IV, it's worth putting a little more effort into the manual — at least putting all the information about commands into one alphabetical section.

Evidently there are separate user's guides for each part of the hardware, but I didn't receive copies. I assume they are better than the DOS manual, as NEC would have had to do all the work itself; I hope so anyway.

And Now IV the Conclusion

NEC has a reputation for producing well-made, reliable hardware, and backing it up with good service. The APC IV fits into the



Everything but the Kitchen Multisync

BORING, BORING we said. Review a monitor? What can you say about a monitor is a monitor?

The man from NEC Home Electronics (quite a different kettle of chips to the Computers and Communications division) insisted we'd like his new gee-whizz screen, so we gave in.

Don't get us wrong, we like monitors. Computing could be really hard on the eyes without them. But we had a monitor atop every PC we were using, and we figured our office could do without another box (you should see our office you should try to *move* in our office).

The man from NEC was right. We loved his new multisync monitor (model JC-1401P3E/EE/R, or "The Intelligent Monitor" for short). For those who haven't run into the problem it solves, we should mention the various standards of IBM graphics cards — the Colour Graphics Adaptor (CGA), the Enhanced Graphics Adaptor (EGA) and the Professional Graphics Adaptor (the golf tournament) — run at different frequencies, and require different monitors. Switching graphics cards can turn out to be an expensive pain.

The NEC multisync automatically

scans all the frequencies from 15.5 KHz to 35 KHz, and adjusts itself to suit, with a resolution of 800 by 560.

It offers both TTL and analog inputs, and has a Text Switch which allows a choice of one of seven colours for a monochrome word processor or spreadsheet display. The screen is a crisp, clear 36 cm diagonal, with a large viewing area.

We moved the multisync from machine to machine and it worked like a charm. The picture from the EGA board was excellent and the ability to switch graphics cards at will was ideal for people like us who are constantly changing machinery.

It's just the shot for AT buyers who want high-resolution graphics from packages like Autocad, Graftalk and so on. Unless you're convinced you'll never need graphics you should be investing in an EGA card and a monitor like this straight off. If nothing else, it makes the IBM easy on the eyes instead of the 'ugly' provided by the CGA.

The NEC multisync costs \$1760 retail — a little frightening at first, but when you look at the cost of high-quality monitors with this resolution it starts to make sense. The flexibility of its automatic adjustability is a bonus. □

mould, doing its job quickly, efficiently, quietly and compatibly. The entry-level model sells for \$9935 including tax, which is certainly competitive. The Advanced Graphics machine costs \$10,448, and the Power Graphics model \$12,244. If you want to add a 360 Kbyte floppy drive to allow you to transfer data to and from an

IBM PC or compatible (something *no* 1.2 Mbyte drive will do reliably), it'll cost you another \$450.

It may not be the fastest AT on the market, but it's certainly one of the smartest. If NEC's marketing matches its engineering, the company should do as well within the IBM arena as it has done without. □

1200/75 BAUD SMART MODEM: \$395

A revolutionary, new, Australian-made modem for IBM, Apple IIc, etc.

"1200/75, 300 Baud full duplex, Hayes-compatible, auto-answer, auto-dial, auto-disconnect, auto-Baud rate select, auto-line turnaround, fully software controlled, VIATEL, RS232 connection, optional V.22 1200 Baud full duplex, mains powered, microprocessor controlled, intelligent standalone modem for IBM, Apple IIc, Macintosh, MicroBee and any computer with a serial port for under \$400....."

That was my shopping list when I went looking for a modem for my IBM. I needed a standalone modem that I could leave connected to the phone logging data while the IBM was disconnected, and that could be connected to a variety of other computers. And I didn't want to pay over \$1000.

A fully-featured RS232 modem for under \$400.



GPA Supermodem connects to phone and serial port

And, of course, by now you'll know that we built thousands and they have taken Australia by storm. Telecom, Westpac, CSIRO, UNSW are some of our larger customers. Their responses have been universally enthusiastic: "Fantastic! How did you do it for the price?" or "We want more of them. When will you have more stocks?" Some of our customers have bought up to 10 modems at a time!

For the first 3 months of production demand exceeded supply, but we have caught up now and SuperModems are now available ex stock. We have cables to suit most micros and can advise on the most suitable software for your computer. Viatel software is now available for the IBM and Apple IIe, IIc. Terminapple comms software to suit also available.

IN STOCK NOW

TECHNICAL FEATURES

- * Standalone, direct-connect serial modem
- * 6809 microprocessor controlled
- * Auto-answer, auto-dial, auto-disconnect, auto-line-turnaround
- * CCITT V21 and V23
- * V22 option, 1200 baud full dup available soon for \$160.
- * VIATEL software available \$25 (Apple/IBM)
- * Plugs into any serial port
- * Automatic Baud rate selection
- * Mains powered & onboard speaker
- * Meets Telecom approval specs
- * Fully software controllable
- * Internal expansion slot
- * Computer cables (specify) \$30



GPA Supermodem: Note V22 expansion socket

"That's all very well, but what do I DO with a modem?"

* **WORK FROM HOME:-** Interrogate your office computer. Send and receive messages, text for typesetting, price list updates, contracts, advertising drafts etc. Interrogate databases worldwide, e.g. MIDAS, DIALOG, LEXIS, MEDLINE etc.

* **RECREATION:-** VIATEL, BULLETIN BOARDS, USER GROUPS. etc.

* **VIATEL:-** Electronic mail, Instant telex at a fraction of the cost. Instant price updates as they occur on the stockmarket. Buy & sell. Home banking. Instant gambling on any race in Australia through VIATAB. Shop from home. Airline and hotel bookings. Home education courses.

The possibilities are limitless and exponentially expanding. The modem adds a third dimension to your computer that opens up as you explore it. You have to experience for yourself the magic of clicking between Sydney, Los Angeles, New York, Mexico City by modem.

Instantly, transparently and cheaply. Culling obscure facts. Interrogating mighty databases. Buying. Selling. Dazzling.

10 DAY FREE TRIAL

This really is a brilliant modem, but the only way you will ever find out for yourself is to order one. But you don't have to take my word for it. You can order a gpa SuperModem, try it out, and if it doesn't live up to your expectations send it back within a fortnight for a FULL REFUND. NO QUESTIONS ASKED. I could go on but the answer is to try it for yourself. We showed this ad to some of our best customers and they were sceptical that a \$395 modem could do everything we claimed. But when we loaned them a gpa SuperModem they were ECSTATIC. It really is that good.

TO ORDER: Ring me now on (049)26 4122 and quote your credit card number for overnight delivery. Or mail your cheque, purchase order or credit card number on the enclosed order form. Mail to Micro-Educational Pty Ltd, 8/235 Darby St NEWCASTLE 2300

ORDER FORM

MICRO-EDUCATIONAL
8/235 Darby St
NEWCASTLE 2300

Dear George,

Please rush me _____

GPA SuperModem/s @ \$359 ex/ \$395 inc for my IBM PC/AppleIIc/Amiga/Mac/Bee OTHER _____ on 10 day approval. If I am not delighted with it I will send it back within a fortnight for a FULL REFUND. Other extras as follows:

Cable \$30 Viatel s/w \$25

NAME: _____

ADDRESS: _____

P/CODE: _____

Enclosed please find cheque/ purchase order/ Bankcard/ VISA/ Mastercard

for \$ _____

Add \$7 per modem for insured overnight KWIKASAIR courier.

MICRO-EDUCATIONAL PTY LTD

8/235 DARBY ST NEWCASTLE 2300 Ph (049) 26 4122

Australia's Largest Computer Mail-Order Company

BUY DIRECT... WITH CONFIDENCE

We offer:

- * 8 years experience
- * Overnight delivery
- * 10 day money-back warranty
- * 6 months full service warranty
- * Top quality national brand products
- * Competitive prices
- * Excellent workshop service
- * Friendly phone advice
- * Phone, VIATEL and mail ordering
- * AND we treat you like family!

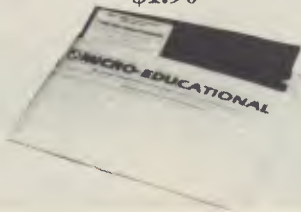
TOP SELLERS

3.5" DISKS
SS/DSDD \$5



JOYSTICK IIe/IIc \$45
IBM JOYSTICK \$50
SWS 60 DISK BOX \$25
YA-40L 3.5" DISK BOX \$25

5.25" DSDD
\$1.90



DISKS \$1.50

(\$1.40 IN 100'S)



That's a fantastic price for lifetime warranty, Micro-Ed logo, SSDD disks. These are premium quality, machine-manufactured diskettes. Made in the US by Wabash DataTech. Suit Apple, Commodore, Microbee etc. Will also suit IBM as they can be used double-sided. You can spend up to \$8 each for premium quality diskettes. Ours cost \$1.50 because we sell A MILLION DISKS A YEAR! When you shift disks in truckload quantities you get real economies of scale. Check around. Even the chain stores are dearer than us on lifetime warranty diskettes.

We won't be beaten on price for quality disks!

GPA SUPERMODEM \$395



Our top-selling modem. Features:

Auto-answer, auto-dial, auto-disconnect, auto-line-turnaround, Hayes compatible, 300Bd Full-duplex, 1200/75 Viatel mode, 1200Bd full-duplex optional extra (\$160 extra). Over 1100 sold! \$395 (Cables \$30 and IBM/Apple Viatel software \$25 extra.)

Also available as a Kit for \$299!

FREE

- * Apple/IBM Library Disk (orders >\$50)
- * Micro-Educational pen
- * Newsletter/ Catalog

ORDER FORM

To: PO 160
THE JUNCTION 2291

Dear George,

Please rush me the following: _____

and enter my name in the PC DRAW. Enclosed please find cheque/
purchase order/ money order/ Bankcard/ VISA/ MasterCard

_____ for \$ _____ (add \$7 courier)

NAME: _____

ADDRESS: _____

COMPUTER: _____ SIGNED: _____

THE LITTLE BLUE SPORTSCAR?

'Convertible', the name has all sorts of cheeky, sporty connotations . . . Unfortunately, IBM had this machine on the grape vine/production line for so long, that the industry had long ceased revving up for it. And when the Convertible finally idled out of the showroom, it provoked little more than a sigh. John Hepworth weighs up its advantages in today's market.

THE LONG-AWAITED 'clamshell' has arrived. For nearly two years rumours were rife about an imminent laptop PC from IBM that would run all the software written for the desktop PC. Coming from IBM, it *should* be the definitive laptop . . .

A quick look around the basic machine sees it to be slightly larger than most other laptops; with the screen closed, the Convertible is 310 mm wide, 375 deep and 70 thick. Little else can be seen when the Convertible has its top shut, except for clips on the rear panel for the attachment of external modules, the expansion bus cover and a battery hatch. A pushbutton power switch and DC inlet socket are on the right side towards the rear.

When you open the screen, the disk drives (mounted under the screen hinge) rise, as does the keyboard, giving a good operating angle. All these mechanical movements feel reassuringly sturdy.

Contrast of the 80 by 25 display is controlled by a horizontally sliding control near the lower-right corner of the screen. The display is not as good as that on some other laptops, having lower contrast and apparently less sharpness — that's basically a bit of a foggy windscreen.

With only about 120 degrees of swing, the LCD screen cannot be laid back flat against the top of the machine when an external monitor is used; instead, provision is made for the whole LCD display assembly to be removed. The inability to lie it right back on the top of the machine makes it a little difficult to get a good viewing angle when using the Convertible on your lap, outdoors, or in poor light — this machine really is better off on a small table.

The Convertible has its own, unique dashboard (keyboard layout). The 78 keys have an excellent feel, with good initial pressure followed by easy travel. It's a bit

of a shame, and an inconvenience, to have to learn yet another layout, though! At least, the key spacing is the same as that on a PC, so there's no cramped feeling using the main keyboard.

The internal, rechargeable, battery has a life of six to 10 hours, depending on how hard you drive it. In addition, the RAM has battery back-up. The system can be set to automatically turn off after one to 255 minutes without keyboard activity, or to run continuously. Another option sets the system to either resume or reboot when turned on. If the option set is for 'resume', processing starts where it left off.

Internally, the Convertible has 256 Kbytes of RAM, expandable to 512. An internal modem can also be installed. No serial or parallel ports are built in, nor is there a built-in towbar for an external monitor. These 'options' are added by clipping external modules to the rear of the machine. Three such modules are

IBM CONVERTIBLE

available: a CRT adaptor, a serial/parallel adaptor and a printer. Adding the modules considerably increases the bulk and weight, and hence the turning circle, of the machine.

With the Convertible came DOS 3.2, and a DOS shell, the Applications Selector. This takes over most of the grease-and-oiling tasks, such as formatting disks, copying, diskcopying, erasing and so on. The Applications Selector allows simple configuration of the system, including setting the system date and time, the display mode, auto power-off period, and auto LCD blanking delay. It also shows available memory, the connect state of parallel and serial ports and the modem, and the number of drives. Most actions are single key, and FI consistently gives help, while F10 exits the current task. The Applications Selector also includes a simple notepad, scheduler, phone list and calculator.

Notewriter

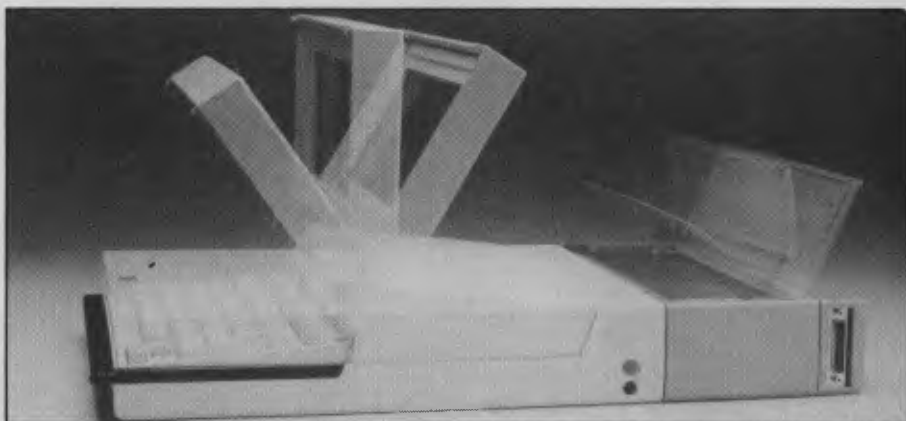
Notewriter seems to be a cut-down version of Displaywrite. It wordwraps, and supports standard word processing features, such as margins, block moves and insert. Like all versions of Displaywrite, in insert mode this program only reformats and wordwraps the current line, and simply moves down all subsequent lines in the paragraph. Pressing F6 with the cursor anywhere in a paragraph reformats all lines in that paragraph. The left and right margins appear on screen. Creating a top margin is done by using the Carrier Return (IBM's terminology) to make a few blank lines. Pagination does not rate a mention in the manual — and could not be empirically determined without a parallel printer adaptor.

Schedule

This is a useful little diary. The display can be condensed to show a particular week or month; in this mode no details of entries are shown, but markers are placed to indicate on which days you have appointments.

Phone List

A very natty phone list program is included. Names, addresses and phone numbers are entered and saved on disk. Subsequent searches can be made on the leading characters of an entry, so searching for 'sm' will display all the Smiths, Smalls, Smigginses, and so on. The phone list also offers auto-dialling, if the Convertible is fitted with a modem.



Calculator

The Applications Selector also has a nice calculator program, which emulates a four-function (plus percent) calculator on screen. It also displays all entries in the calculation with a symbolic 'tape'.

Compatibility

The Convertible runs on most standard PC-DOS fuels. I tested it with DOS 3.20, and found no problems with a relatively limited range of software. Normally I would take a whole swag of my software and try it, but the machine came without a means of transferring programs from 13 cm disks to the Convertible's 9 cm format. IBM makes an external disk drive for its desktops — which would have provided me with some means of converting formats — which was unavailable at the time of review. There's no external 13 cm drive designed for the Convertible and, to make matters worse, without a serial port I could not even do a computer-to-computer file transfer by cable. I have heard reports that the Convertible has problems running some packages designed for the PC, if DOS 3.20 is used, and that these problems were corrected with DOS 3.21. The disks and format are compatible with those used by Toshiba laptops.

Power Supply

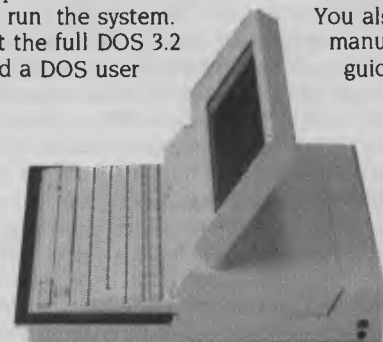
The Convertible's external power supply also functions as a battery charger while the computer is being used. It automatically adjusts for supply voltages, and can be used with 100 to 240 volts. Cords for United States 3-pin and standard Australian power points were included. (And the optional power supply adapter for the cigarette lighter means you could run Travelling Sidekick while waiting at the traffic lights.)

Speed

The Convertible shows the age of its design in its speed. The Peter Norton Sysinfo program gave a speed index, relative to a standard PC, of 1. (The 80C88 microprocessor is rated at 4.77 MHz.)

Documentation

The Convertible comes with three manuals. The user guide is excellent, and is ringbound with strong covers. It supplies little technical detail, but includes a good sequence of instructions on how to run the system. You also get the full DOS 3.2 manual and a DOS user guide.



Roundup

Is the Convertible the definitive laptop — the little blue sports car everyone will be dying to drive this summer? Unfortunately for IBM the answer has to be no. A couple of years ago it would have been revolutionary, but now other vendors have cheaper, smaller laptops with more memory, faster processors, and more features as standard (such as serial and parallel ports and a clock/calendar).

While desktops with 640 Kbytes and 20 Mbyte hard disks are selling for under \$4000, buyers will walk past the Convertible at \$4100. It's a sturdy, reliable machine that should keep putting along year after year — pity about the price ... □



Plus Hardcard

HARD DISK HOKUM

Hard disk storage is rapidly becoming affordable to almost all computer users. Ewart Stronach was delighted to put two new units, designed to slot into the IBM PC, through their transportable paces.

COMPUTING NEVER seems to progress in smooth transitional stages, but rather takes quantum leaps. The first step into hard disk storage was such a leap, the development of a hard disk on a single card is another.

For those of you still in the dark (to whence I must return when Techpacific want the trial unit returned) let me tell you what a hard disk is. You all know floppies: those little flat envelope-like things you graduated to after cassettes? Well, they typically have the capacity for 360 Kbytes of data, be it programs or the output from programs. They consist of a disk of recording material encased in an envelope of flexible plastic and spin in your disk drive at 300 rpm, while the clever little computer reads the directory and finds whatever you have asked for. Now, 360 Kbytes is not a lot by today's standards, and the time it takes for information to be found is also quite slow. Granted, it's much faster than cassette, but in business applications where disk access is going on all the time, it is a limiting factor.

The first hard disks were almost as big as a modern computer, but they held massive amounts of data and accessed it much faster than the floppies. Today's hard disks are small enough to be mounted inside the cabinet of most micros, and are driven by a circuit board controller, which slots into an empty connector on the main board of a PC.

THE PLUS4 HARDCARD

The Plus4 Hardcard from Techpacific takes up a minimum of space inside your pet,

and is capable of storing and retrieving up to 10 Mbytes of data — that's the same capacity as approximately 30 floppies. It actually replaces a lot more than 30, as most disks are never filled with data. More importantly, all this information is alive and well the minute you turn on your computer. The time taken to find and read a program is significantly less on a hard disk, and there is seldom any need to change over floppy disks in the middle of an application.

Hard Disk Heaven?

All this and heaven too? Are there any disadvantages to this wondrous thing? Not many. Failures are rare, but when they do occur . . . imagine losing over 30 of your most prized floppies.

So it becomes essential to regularly back-up the information stored. While most of the programs you'd have stored on a hard disk would have been copied from master disks, and can be re-installed, you'll need back-up protection for any data you've generated yourself.

You can back-up to floppies, a method quite acceptable for most small businesses, but there are a number of other methods of protecting your data. Streaming tape back-up, for example, is an add-on unit which records the total content of the hard disk onto magnetic tape, which can be re-played into the hard disk if required. Use of streaming tape is generally restricted to large businesses.

The only other disadvantage of products like the Hardcard is the complexity of directories. You know how long a directory

can get on a floppy, so imagine the directory for 30 of them. Fortunately, our friends at Hardcard have pre-empted your panic, and the Plus4 has an automatic directory system already installed.

Hassle-Free Installation

Installation of the Plus4 is clearly described in the manuals provided, and poses no significant problem. The only minor setback I found was the installation program already on the Hardcard seems to rely on DOS's being a genuine IBM version. The DOS supplied with my new Lingo PC-88 XT has minor differences, and the first couple of attempts to set up the disk for operation failed. After changing to an original IBM DOS, I managed to install the card at the first attempt.

Physical installation is easy; simply remove the cover of your machine and plug the Hardcard into an available slot — it should only take about 10 minutes. From there on the procedure is almost automatic. You power up your revitalised monster on a normal DOS disk and simply type C:INSTALL C. You'll hear a new noise, not obtrusive, and quieter than many floppy drives I have heard, and a small cross will appear in the top-right corner of your screen. This cross stands in place of a disk-active light, and indicates that the Hardcard is being accessed. If your physical installation was correct, the screen will clear and instructions for proceeding will be displayed.

The Hardcard comes already formatted for PC applications, and all the installation program does is transfer your DOS, complete with utility files, onto the boot sector of the Hardcard. It also writes a new disk for you, which will serve as a re-installation disk should you ever need to repeat the process. This whole task should take about a further 10 minutes. (During this time, the computer seems to be working its little heart out with no result, except for the regular friendly progress reports popping up on the screen — "Installation is 40% complete," and so on.

After going through this process, you are prompted to switch the machine off, wait 10 seconds and turn it back on, leaving your A drive open. The computer will look at drive A, decide that's fruitless and

HARD DISK HOKUM

The Plus4 Hardcard can store up to 10 Mbytes of data — that's about the same capacity as 30 floppies. ▷

go directly to the DOS on the Hardcard. After booting it will automatically drop into the menu program I mentioned earlier. This displays a series of numbered menu items for single-key selection.

The disk has already been divided into 16 sub-directories, the first five are arbitrarily named Word Processing, Spreadsheet Analysis, Database Management, Presentation Graphics, and Modem communications. These are dummy titles and may be re-assigned. The next 10 are marked "Not in Use", and the sixteenth is a program-help file.

With the 10 Mb unit installed, the F1 key calls a basic help screen, F2 offers instructions and F4 allows direct DOS commands. F5 lets you modify the menu, and F6 offers you the choice of re-titling the menu and entering up to 12 DOS commands in the same form as a batch file. F7 exits the menu and drops you back to DOS, ready and logged on to your new drive C. The 20 Mb Hardcard has a similar set up with the function keys.

The Hardcard-Program Relationship

"Hang about," I hear you cry, "What about my favourite game which can't be copied and needs to be in drive A at power-up?" Don't panic child, simply proceed as you did before the miracle, put King's Quest in drive A and boot up. The computer always checks drive A first and operates on that drive if it finds anyone at home.

Most application programs, such as Lotus 1-2-3, Wordstar or other word processors, and databases, have full installation instructions for loading them on to the Hardcard. These can be inserted in the menu system and called with a single key-stroke after initial boot-up. Most copy-protected games cannot be installed on a hard disk of any description.

Most other hard disks come as two units, the controller board and the disk itself. These must be mounted inside the computer case, often requiring special brackets and cables. The space taken up inside the case can preclude other slots being utilised, and do-it-yourself installation is not recommended. The Hardcard could not be simpler to install. On my Lingo, the lid hinges open like a car bonnet and removal of the Hardcard takes only seconds.

This simplicity of installation and removal is the key to Hardcard's flexibility. It may be loaded with data in one computer



and transported to another with data intact. Unlike many other hard disks, it automatically 'parks' the head after use — a prerequisite to transporting any hard disk.

The software contained on the Hardcard also allows easy owner installation. As the disk comes pre-formatted with installation programs ready to be used, the time elapsed from receipt to use should be no more than 35 minutes. Other hard disks require formatting and a fairly complex set of installation routines, often beyond the understanding of a casual user.

The price difference between Hardcard and regular hard disks is minimal, and well worth it for the convenience and ease of use it affords.

Tech Specs

For the technically minded, let's look at the spec sheet. The Hardcard 20 Mb formats to 21.20 Mbytes (min.) and seek time, including settle time, is 10 milliseconds track to track with an average of 49 ms. The disk rotates at 3600 rpm, and has a recording density of 13,917 bpi. It has 2460 tracks, with four read/write heads.

The 10 and 20 Mbyte units are the same size, with a thickness of 25 mm, a height of 106 mm and a length of 341 mm. This means it will take up one long slot on your PC without protruding over other cards or blocking access to another slot. The power

consumption is a meagre 0.67A (12V), 0.47A (5V) under worst-case conditions.

This should not tax any PC power supply.

Reliability is of paramount importance with this type of storage unit, and a quoted 'mean time between failures' of 40,000 hours and a component life of five years is most encouraging. The Plus4 Hardcard is capable of continuing to operate in quite a hostile environment, with a temperature range from 4 to 50 degrees Celsius and the ability to withstand a shock while working of up to 10 Gs.

All in all, the Plus4 is a well-engineered piece of equipment, viable in any situation, but of particular relevance to those who have a need to transport data between machines. The minor price difference between Hardcard and more conventional hard disk units is a small price to pay for such convenience. If I miss two payments on the car, one on the fridge and one on the telly, I might have enough for a deposit on one ... No, seriously folks, I do own the telly.

THE QUBIE BT20 HARDPACK

The Qubie BT20 Hardpack shares most of the attributes of the Plus4 Hardcard. While it is shorter than the Hardcard, it is substantially thicker — it's designed to fit into slot 5 of a PC, behind the power supply. It's controller board, attached to the unit, is capable of supporting two disk drives, and it requires an additional power cable to the power supply. A 'Y' connector is available to split existing disk connectors, if required. ▷

HARD DISK HOKUM

Installation is a fraction more complex than with the Hardcard. Being wider, the Qubie will overlap another slot if 5 is already in use, and some moving around of existing boards may be necessary. As it does not derive its power from the slot, moving the Qubie from machine to machine is not so convenient.

After fitting is completed, the computer should be booted in the normal manner and you'll hear a faint chirruping sound — a flock of hungry little sectors waiting to be fed. The disk comes already low-level formatted, so all you need do is partition if required, and format.

Partitioning the disk gives you the opportunity to place more than one operating system on the same disk, and therefore be able to boot to say, either DOS 3.2 or Xenix. When you opt for two operating systems, the computer sees two hard disks on power up, and can be directed toward your choice.

To format, the hard disk invokes a program called FDISK.COM, present on most DOS disks, which immediately looks at the hard disk and reads the menu contained on the floppy supplied with the package. A screen of options appears and formatting takes place, all inside 10 minutes. The DOS of your choice is loaded into the root directory, and you are prompted to load the free directory program supplied with the unit. This program, called 1DIR, is a

menu-driven directory manager which allows you easy access to any disk in the system.

From there on, it's business as usual; just load your software into sub-directories and tuck those floppies away somewhere safe in case of emergencies.

What's in the Ute?

A full set of hard disk utilities is also supplied, which allows you to re-format, check tracks, lock out bad tracks and alter the interleaving factor. This interleaving factor describes the placement of data on the hard disk. As the disk spins at 3,545 rpm, data is written every seven physical sectors, not sequentially. This is a standard setting and it is recommended that it not be changed. Under special circumstances, minor speed improvements in access time may be gained by alteration. Attempts to verify the disk surface or alter the format parameters will destroy any data present, so care should be taken in the use of these utilities — it's a good idea to re-name the format program QUBIEFMT.EXE as a BAK file to prevent its accidental use.

The specifications of the Qubie are pretty much like those of the Hardcard, but access time is a little slower. Average access time is 80 milliseconds, with a track-to-track time of 18 ms. Power consumption is +5V, 2.0 amp and +12V, 175 Mamp. A component life of five years, with a mean time between failures of 10,000

power-on hours should provide a very useful service life. The quoted mean time for repairs is a meagre 30 minutes.

The Qubie lacks the automatic parking facility of the Hardcard and so has to be parked, with the supplied parking program, before being moved about. When this program is invoked, it moves the disk heads off the recording surface and locks up the computer.

From a comparative point of view, each unit has its advantages. The price of the Qubie, at \$1599 retail, is about \$400 below that of the Hardcard. Although the Qubie has a slower operating speed, this isn't a bother in practical terms, and the loss of easy mobility would only inconvenience a small number of users.

As with so many of these things, price becomes the ruling factor in my decision-making process. I will reluctantly return the Hardcard and joyfully accept the minor shortfalls of the Qubie. My personal contact with the Sydney staff of Qubie lead me to believe that service and advice are near at hand and willingly given. (Note their *new* address and phone number.) The ability of the controller to operate a second drive is a strong point; we all feel we would never need more than 20 Mbytes of storage, but data has a habit of expanding to fill the available space, and the ability to add a second drive at a lot less than the first could be most welcome in the future. □

PRODUCT DETAILS

Product: Plus4 Hardcard
Manufacturer: Plus Development Corp.
 Milpitas, California, USA
Review Copy From: Techpacific
 7 Bank St,
 South Melbourne 3205 Vic.
 (03) 690 9055
Price: Hardcard \$1254
 Hardcard 20 \$1934

Ratings

POOR GOOD V.GOOD EXCELLENT

DOCUMENTATION	████████████████████
EASE OF USE	████████████████████
DESIGN	██████████████████
RELIABILITY	██████████████████
VALUE FOR MONEY	██████████████████

PRODUCT DETAILS

Product: BT20 Hardpack
Manufacturer: Qubie
Review Copy From: Qubie
 10/16A Hearne St,
 Mortdale 2223 NSW
 (02) 534 6000
Price: \$1599

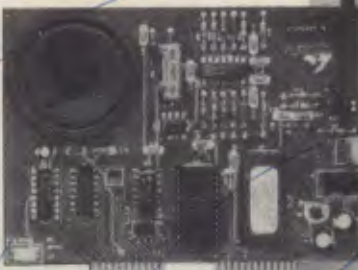
Ratings

POOR GOOD V.GOOD EXCELLENT


DOCUMENTATION	████████████████████
EASE OF USE	████████████████████
DESIGN	██████████████████
RELIABILITY	██████████████████
VALUE FOR MONEY	██████████████████

Speech synthesis has been plagued by an inability to recognise and replicate the diversity of human output.

The most successful methods to date jaw their way through vast amounts of memory. Votalker offers a reasonable compromise between output quality, appetite and cost. Rose Vines spoke to this new product on the phoneme.



The Votalker IB for the IBM PC and XT (or very close compatibles.)



The Votalker AP for the Apple II, IIe and Apple Plus.

say it with **VOTALKER**

THERE ARE three basic methods of speech synthesis commercially available: waveform, formant and phoneme. Waveform synthesis uses samples taken from a digital recording of a human source at high frequency, to reconstruct a time-varying wave shape of the voice. Each sample indicates the magnitude of the signal at that instant. This method gives a fairly close approximation of the human voice, but requires heaps of data storage space — depending on the hardware used, it can require 10,000 to 80,000 bits per second to perform the synthesis.

Formant synthesis measures the bands of frequency in the human voice, and uses filters to approximate these bands in the synthesiser. This is much less expensive in terms of data rates (about 1000 to 2000 bits per second), but some of the identity of the human source is lost in the process.

Phoneme synthesis uses frequency

bands, too; but, instead of extracting the bands from a human source, language building blocks, called phonemes, are used as the basis for synthesis. The phonemes must be properly sequenced to build pronunciations and words. This form of synthesis is characterised by low data rates (100 to 400 bits per second) and reduced accuracy in mimicking the human voice.

The Votalker Speech Synthesiser — from United States company Votrax — uses phoneme synthesis to get your computer talking. I reviewed the Votalker IB, which runs on IBM machines and (very close) compatibles. There is also a Votalker AP for the Apple and a Votalker C64 for the Commodore. The IB and AP are based on the SC-02 synthesiser chip, while the C64 is built around the SC-01.

The Votalker IB package includes a board containing the synthesiser chip, speaker and various switches; Speech Op-

erating System (Sonix) software from Artic Technologies, and two manuals — one for the hardware and one for the software. The board fits into any slot in the expansion board, leaving filter and voice mode switches and the volume control easily accessible from the rear. The main software components are the Kernel, the Text-to-Speech module and the Phonetic Speech Editor.

First Words

The documentation for the Votalker fits into the parson's egg category — good in parts. The hardware manual is brief and easily digestible, with enough detail to get you going, but not enough to clog your brain. The software manual is informative, with lots of examples of the synthesiser in use, but it sometimes leaves you up in the air and assumes you have a lot of background knowledge.

SPEECH SYNTHESISER

One of the best things about the documentation is it is soundly based ('scuse the pun) on instant gratification: the manufacturer *knows* you're dying to get something — anything — out of your synthesiser right away, and provides various means of doing so. There are demonstration programs you can run before you know anything about the package; these give you an idea of the basic capabilities of the system, and leave you wanting to do something better.

Because of the limitations of phoneme synthesis, the basic sounds are not all that great. I found it fine when I was reading text on the screen as it was being spoken by the synthesiser; but when I read a file in blind and had the Votalker speak it to me, I was pushed to understand one word in two. This is partly a matter of acoustomisation — the more you listen to it, the more you understand it, just like listening to someone with a very thick accent. (By the way, the standard Votalker

The tools are there, the hardware is there. What are you going to do with it? Firstly, the Votalker is fun; it's great fiddling around with its features, and dedicated hackers will probably be able to produce some pretty amazing results.

accent is United States mid-west.) However, the sound can be vastly improved by using an external speaker (a connector is provided) and the Speech Operating System's software tools.

Becoming Talkative

The Kernel is the heart of the Speech Operating System, providing an interface between the Votrax SC-02 chip and applications software. You can write programs in assembly language, BASIC or other languages which access the Kernel routines, to produce speech. The Kernel must be loaded into memory before using the rest of the system.

Text-to-Speech (TTS) combines with the Sonix Kernel to convert arbitrary English text into phonetic speech. This module is also memory-resident, and must be loaded before running any program which uses its features. The TTS module converts strings of characters passed to it from a program into a sequence of phonemes. It does this by comparing the input to a set of letter-to-sound rules: when a rule is found matching the current position in the input string, the phonemes for that letter (or letters) are transferred to the speech output buffer.

Over 600 rules are used by the TTS module. However, this is not enough to cope with the delightful illogicality of English pronunciation, and thus, to improve the performance of the TTS, you can either fool the system by misspelling a word, or use an Exception Table. An Exception Table contains a list of words likely to cause the TTS module trouble, and offer-appropriate phoneme sequences. TTS first checks the Exception Table before attempting to translate a character sequence.

The demonstration program is provided to show off TTS's capabilities. You need BASICA to run it. The demonstration will convert files or keyboard input into speech, and gives you control over four speech parameters — frequency (rate), amplitude (volume), inflection (pitch) and filter frequency. Playing around with these parameters gives you a variety of different voices and tones. However, don't do what I did — read in a file with the headings double-underlined; the program read the heading and then started intoning "equals equals equals equals".

The Phonetic Speech Editor (PSE) is a menu-driven program providing editing functions for creating phoneme sequences with associated speech parameters; using this, you can build up vocabularies (called VOCs) and lexicon files. Several modes of vocabulary storage are available, giving you the choice between control over all the synthesiser's registers

HEX	SYMBOL	EXAMPLE	HEX	SYMBOL	EXAMPLE
00	PA	(pause)	20	L	lady
01	E	keep, eat	21	L1	Louvre
02	E1	become	22	LF	call
03	Y	marry	23	W	want, why
04	YI	year	24	B	big
05	AY	made	25	D	said
06	IE	ear	26	KV(HVC)	give
07	I	mit	27	P	part
08	A	made	28	T	taste
09	A1	attainment	29	K	kite
0A	EH	said	2A	HV	(voiced)
0B	EH1	enter	2B	HVC	(g)
0C	AE	can	2C	HF	hand
0D	AE1	happy	2D	HFCT(k)	
0E	AH	pop	2E	HN	(m, n, ng)
0F	AH1	honest	2F	Z	zip, pays
10	AW	lost	30	S	sing, city
11	O	for	31	J	measure
12	OU	told	32	SCH	ship
13	OO	look	33	V	vault
14	IU	you	34	F	fat, phone
15	IU1	should	35	THV	the, lathe
16	U	you	36	TH	thing, with
17	U1	unit	37	M	man
18	UH	under	38	N	name
19	UH1	common	39	NG	long, finger
1A	UH2	constant	3A	A	Marchen
1B	UH3	what	3B	:OH	Lowe
1C	ER	word	3C	:U	fun
1D	R	ring	3D	:UH	bluhen
1E	R1	error	3E	E2	bitte
1F	R2	Mutter	3F	LB	bluhen

NOTE: ch = T-SCH, j = D-J
g = KV-HVC q = K-W
x = K-PA-S

Figure 2. The 64 different phonemes available with the SC-02 chip used in the Apple and IBM versions of Votalker.

SPEECH SYNTHESISER

or conserving disk space.

VOCs are collections of phoneme sequences, with each sequence representing the pronunciation of a word, phrase or sentence. Lexicons are collections of VOCs, and PSE uses a look-up table to access the correct pronunciation.

Using the PSE takes a lot of patience. In fact, getting the best from the Votalker in general takes a lot of patience. But once you've put in the time creating solid lexicons, you then have a great deal of flexibility and power.

A lot of useful information is provided in the chapter on 'Creating Your Own Speech'. Once you understand how to use phonemes, the PSE is a useful tool. Not only does it let you design phoneme sequences, but it also gives you instant playback, so you can assess their accuracy. Exception Tables can be created with the editor, by entering VOCs in alphabetical order.

A few lexicons are provided on the program disk. They're useful as examples and in the demonstrations, and also give an idea of disk usage. The 200-word WORDS-0 lexicon takes almost 10 Kbytes — about 50 bytes per phoneme sequence. Apart from words, you can create sounds, musical tones and singing. Using the Song:24 vocabulary storage mode — the others are Chain, Speech:16, Speech:24 and Speech:32 — with the numbers indicating the data storage rates in bits, you can create a VOC containing the phoneme sequence for a song's lyrics. It is then possible to adjust the phoneme rates for the proper rhythm, insert pitch information to create the melody and then refine the overall song. Tunes and sound effects can also be created using the amplitude filter and offset controls, or by direct control of the synthesiser from a programming language.

Making Sense

The tools are there, the hardware is there. What are you going to do with it? Firstly, the Votalker is fun; it's great fiddling around with its features, and dedicated hackers will probably be able to produce some pretty amazing results. But at \$629, it's not exactly a toy.

Because the Votalker interfaces with a variety of programming languages, you can produce applications that speak. You may use it to confirm input, prompt or alert a user, attract attention (good for sales demonstrations) or anything else

Mode	Phon	Dur	Infl	Sl	X	Amp	Ra	Tran	Global	BITS
Chain									yes	16
Speech:16	64	4	16			4	4	no	no	16
Speech:24	64	4	32			16	16		no	24
Speech:32	64	4	32	8	16	16	16	8	no	32
Song:24	64	4	4096			16	16		no	24

Figure 1. Votalker's vocabulary storage modes and the number of settable values available in each. Phon is the phonemes available — see Figure 2; Dur is the duration of the sound; Infl is the pitch; Sl is the slope of the inflection which is used to make smooth transitions from one inflection to the next; X is the rate adjustment for Dur to differentiate between, say, accented and unaccented syllables; Amp is the amplitude values which decrease at, say, the end of a sentence, or increase to stress a word; Ra is the speed of speech, that is, how fast the sounds follow one another; Tran is the transition time from one pitch to another; and Global indicates that global settings can be changed in Chain mode. The last column, BITS, is the number of bits required per line of data in a particular mode.

you can think of. An important area in which it could be put to use is in creating software for disabled users, especially those who are blind. While the sound reproduction quality is limited by the phoneme synthesis method, the software tools provided really do let you get the most from the SC-02 if you're prepared to take the time.

To make the job simpler and more flexible, there are some optional software packages available for the Votalker. Port Talk makes the Votalker appear like a printer or serial device by redirecting text sent to a selected port to the TTS module. This means speech can be controlled like a sequential output device or file. Port

Talk also provides controls over pitch and rate, which let you continuously alter the speech output until you achieve the desired result. The Sonix Toolbox is a set of utilities for managing lexicons, and a Sonix-Turbo Pascal Speech Interface is also available. The programs cost \$89.90, \$79.90 and \$45, respectively. Votalker AP retails for \$470, and the Commodore version is available as a plug-in cartridge for \$264.

If you have an application which could benefit from the addition of speech, and you're happy with both the constraints and advantages of phoneme synthesis, the Votalker gives you all the tools you need to do the job. □

Product Details

Product:	Votalker Speech Synthesiser
Manufacturer:	Votrax Inc, Troy, Michigan, USA
Distributor:	Mike Boorne Electronics 3/61A Hill St, Roseville 2069. (02) 46 3014
Retail Sales:	Dick Smith Electronics Stores
Price:	\$629 (IBM) \$470 (Apple) \$269 (C64) — See text for details.

Ratings

POOR GOOD V.GOOD EXCELLENT

DOCUMENTATION ████████████████████

EASE OF USE ████████████████████

DESIGN ████████████████████

RELIABILITY ████████████████████

VALUE FOR MONEY ████████████████████

Will your data be sentenced to death, or word perfect for life?

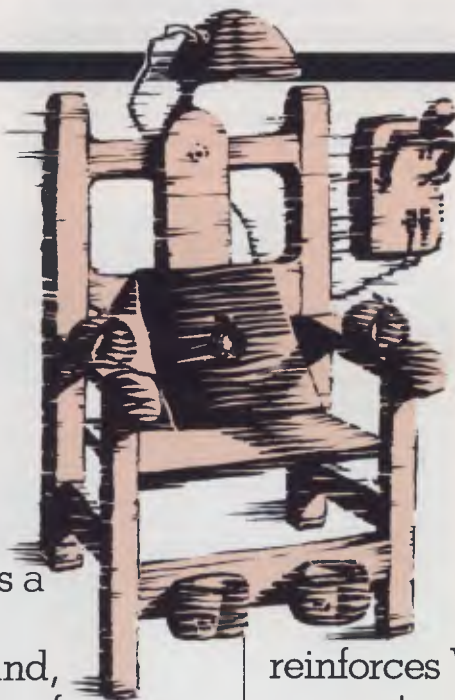
The invaluable data stored on most floppy disks can meet a sudden, untimely death from the most unexpected enemy.

Static charges.

In every office, they're everywhere.

Take a stroll across a carpeted floor with a floppy disk in your hand, and you can easily transfer sufficient static to the disk to cause serious damage. Even total data loss.

Verbatim Datalife is one floppy disk which *doesn't* let this problem kill your data.



A patented liner, called DataHold, disperses static charges before they can penetrate the magnetised disk.

So, instead of sentencing your data to death,

Verbatim, with exclusive DataHold,

reinforces Verbatim's guarantee of safe data storage and retrieval for at *least* a human lifetime.



Verbatim®
Word perfect. For life.

Now available from: **NEW SOUTH WALES:** Computer Resources Co. (02) 516 4099. Computer Supplies (Aust.) Pty. Ltd. (02) 439 5533. N.T.T. Supplies (Australia) (02) 357 5522. Twinlock Acco (02) 698 7288. **CANBERRA:** Computer Resources Co. (062) 80 6748. **VICTORIA:** Barries Office Supplies (03) 329 6500. Computer Resources Company (03) 543 5633. Computer Supplies (Aust.) Pty. Ltd. (03) 241 1071. Dataparts Pty. Ltd. (058) 21 7155. Twinlock Acco (03) 544 4000. **QUEENSLAND:** Computer Resources Company (07) 393 0288. Graphic Data Pty. Ltd. (07) 852 1877. N.T.T. Supplies (Australia) (07) 52 7333. Twinlock Acco (07) 52 4806. **SOUTH AUSTRALIA:** Computer Resources Company (08) 363 1133. Excel Computer Supplies Pty. Ltd. (08) 363 0466. Qualitron Pty. Ltd. (08) 276 2566. **WESTERN AUSTRALIA:** Computer Resources Company (09) 381 9588. EDP Supply Company (09) 322 4699.

Office Products International (W.A.) Pty. Ltd. (09) 361 7422.

VB109

WELCOME TO GEOS

GEOS stands for graphics environment operating system

geos contains applications

including a paint program

fonts



A NEW C-64!

this is californian

all of these fonts were printed on an MPS 803

When the Commodore 128 was released a little more than a year ago, the predictions were that the C64 would be phased out. However, the popular little 8-bitter gathered about it the ranks of its army of software and peripherals, and made a show of strength convincing enough to prompt Commodore to virtually re-release it, with a few significant changes. Ian Allen took one of the new C-64Cs home.

WHENEVER YOU read figures on computer sales, you see names like IBM, DEC, and Apple, but you won't see names like Microbee, Amstrad and Commodore. That's because the people who compile the figures only count what they define as 'business' computers. 'Home' computers don't figure, ostensibly because they are not powerful enough for 'real' computing, but the unstated truth is that they just don't pay well enough.

Home computers are aimed at people who pay for their purchases themselves (rather than the company they work for). The home market demands value, and the intensely competitive area of supporting

COMMODORE 64 C

software and hardware add-ons has meant relatively low profit margins. The home computer market simply doesn't support the lucrative infrastructure that developed around business computing, and hence the lack of interest from the compilers of figures.

But if the measure of success were truly counted in terms of sales volume, the Commodore 64 would have to outrank any of the business machines. What other make or model can claim to have well over five million 'installed' units?

The Commodore 64

The C-64 made its debut about the same time as the 16-bit IBM PC. While most pundits were predicting the end of 8-bit machines, Commodore had deliberately designed such a machine for the home market. The C-64 combined extraordinary graphics and sound capabilities into a package that retailed for the then amazingly low price of \$700. It was also well thought out.

It used the same V.2 BASIC of the VIC-20 and PET machines, which meant a substantial pool of software was already available. It had RF output for a standard television (although a monitor output was also supplied) and it even used a joystick pin configuration compatible with that of the Atari 2600 video game, which most stores already stocked.

Many people attribute the success of the C-64 to Commodore's victory in the price-cutting war which developed between itself, Atari and Texas Instruments. True, Commodore could manufacture and move product more cheaply than anybody else (partly because it owns chipmaker MOS Technologies), but the C-64 was also a technically innovative computer. The concepts it introduced have kept 8-bit computers alive ever since — even the Apple IIe uses them, and so do some 16-bit models.

There were two major breakthroughs. The first was the use of 'gate' arrays, a technique which enabled memory banking and therefore access to more than the theoretical 64 Kbyte limit of memory for 8-bit machines. Commodore achieved this by adding additional address lines to the 6502 processor, creating a hybrid chip called the 6510. This new processor used the same Op Codes as the 6502 and was therefore fully compatible with all machine code written for it, but the extra lines enabled the 64 to access some 88 Kbytes of ROM and RAM, although not all

**THIS IS THE COMMODORE 64
ONLY \$699.**



July 1983 saw the launch of the original C64 in Australia, heralded with the above advertisement. The accompanying text proclaimed: "The Commodore 64 could be the microcomputer industry's outstanding new product introduction since the birth of this industry." Hyperbole aside, the C64 has certainly had an impact on the industry: the concepts it introduced have kept 8-bit computers alive ever since.

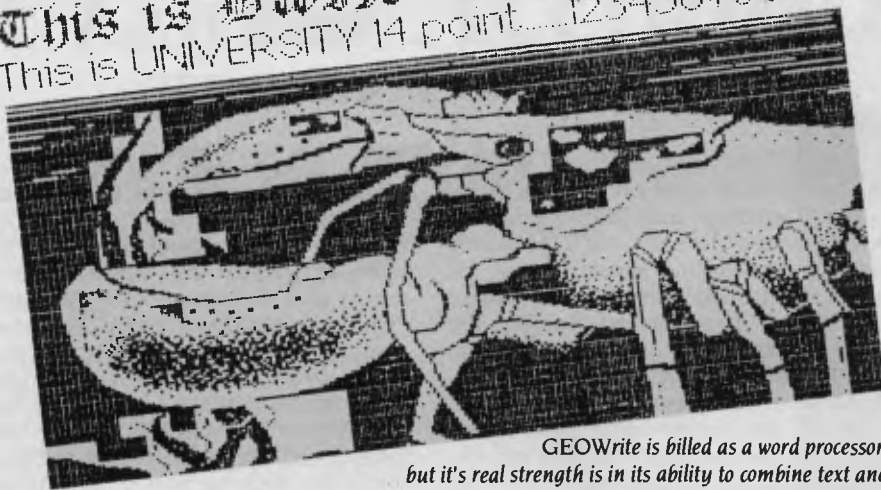
at once. (Nowadays, it's not uncommon to find 8-bit machines accessing up to 512 Kbytes of memory, but it was CBM which showed the way).

The second breakthrough was the use of multiple processor chips. The Atari 400/800 series were actually the first computers with this approach, but Commodore implemented a slightly more refined version. The technique increased the power of the computer by giving off some of the processing to dedicated graphics

and sound chips. In effect, it's a form of parallel processing, and this was the real secret of the C-64's graphics capabilities. Despite the computer's apparently slow 1 MHz clock speed, it can still run 'Flight Simulator II' in colour, just as fast and as smoothly as any IBM clone.

But for all that they got right, the Commodore designers missed one very important development — the rise of the disk drive. When the C-64 was developed, disk drives were expensive and in the preserve

This is an example of different fonts that are available in
THIS is COPY 24 point.
This is BUREAU 18 point....
This is UNIVERSITY 14 point.....1234567890



GEOWrite is billed as a word processor, but it's real strength is in its ability to combine text and graphics. Drawings can be created with GEOPaint and then pasted in.

of business users. It was thought that cassettes would be the medium for the home market, and so only token provision for disks was made on the 64. Commodore copied the Atari principle of daisy-chaining peripherals, so the 64's 1541 disk drive shared the same serial bus as the printer. The result was a very slow disk I/O rate, faster than a cassette, but not by very much. Transmission speed is not that important with a printer, because the printer head mechanism is always going to be slower than the data transmission, but the same does not apply to disk drive access.

Ironically, back in 1982, Commodore had a reputation for building the best drives in the business. The company's IEEE 4040 dual drives were the mainstay of its business operations and there is no doubt Commodore had the technology to produce something equally good for the 64. Perhaps it was deliberately trying to differentiate its 'home' products from its 'business' ones. Whatever the reason, the lack of a fast disk drive has become the Commodore 64's biggest weakness. It's second biggest weakness has been the limited V.2. BASIC. It may have been fine on the VIC-20, but it doesn't support any of the 64's graphic and sound abilities. Programmers are reduced to PEEKing and POKEing, or are forced into machine language in order to effectively manipulate these features.

Last year Commodore released the C-128. This machine provided both fast disk access and a dramatically improved BASIC, and then threw in C-64 compatibility and CP/M as a bonus. It looked like the logical successor to the 64, but was about 50 per cent more expensive. The price differential has now gone down to about \$100, but the C-64 continues to outsell its more powerful cousin. When the 128 was released, Commodore probably had plans to phase out the 64, but its continued strong sales performance has obviously

changed the company's corporate mind ... and now we've seen the release of a new model 64.

C-64C

It's called the 'C-64C', and is functionally and practically identical to the standard 64. It has the same processor, the same I/O ports and the same memory map. The only differences are that it has even fewer chips inside it, a much tidier main circuit board, better RF shielding, and a completely new case modelled along the same lines as the 128. It's also a little heavier, giving a more solid, quality feel. I'm not sure exactly where the extra weight comes from, but the psychology is right!

It's difficult to criticise this machine because it doesn't claim to be anything other than a 64 in a different case. It still lacks a reset switch. It still uses the antiquated BASIC V.2, and it still has a very slow disk I/O that can't even take advantage of the fast mode of Commodore's smart 1571 disk drive. In other words, it's a 64 and not a 128, (and Commodore is again passing up opportunities in order to differentiate its products!)

GEOS

(Sounds like a new aftershave)

Commodore hasn't completely condemned 64 users to an eternity of slow disk access. Co-released with the 64C is a new operating system from Berkeley Software, called GEOS (General Operating System?). It is an icon-driven system which provides a five to seven-fold increase in disk access speed, in both read and write modes. Although GEOS was not developed by CBM, the company has an arrangement with Berkeley, whereby GEOS is to be developed as the 'approved' operating system. Other software companies are to be encouraged to write their applications to function within the GEOS environment.

DIGICARD
Computer Products

PROUDLY AUSTRALIAN

HARD DRIVE DISK

For: **APPLE II & APPLE III**

10-62 MEGABYTE

Supports:

DOS 3.3, PRODOS PASCAL, CP/M, SOS

AMAZING "RAM DISK" SPEED

DUAL 800K DISK DRIVE

Supports:

DOS 3.3, PASCAL CP/M & PRODOS

Special price:

\$895 INC. TAX

see review:

YOUR COMPUTER-DEC.

HIGH SPEED PRINTER BUFFER

256K of Storage

Automatically takes input from either the serial or parallel input.

Serial or Parallel output is switch selectable.

RRP **\$335** inc. tax

Locally supported by the Designers and Manufacturers

MACLAGAN WRIGHT AND ASSOCIATES

123 McEwan Road, WEST HEIDELBERG 3081
Phone: (03) 458 1211

Whether this happens remains to be seen, but the basic GEOS system comes complete with two applications, GEOPaint and GEOWrite. (If you have a Macintosh, you'll probably feel a certain *deja vu* in response to all of this!)

GEOPaint is designed to create high-resolution colour pictures and then print them. It can handle a maximum printed resolution of 80 dots per inch. The screen becomes a small portion of your image (a 330 by 180-pixel window of the 640 by 800 total). The disk drive is used as a virtual memory, and is accessed when you scroll about your picture. GEOPaint has all the standard features you would expect from a paint program, including a wide variety of brushes, a zoom, a 16-colour palette, extensive editing tools and even the ability to enter text in a number of fonts. GEOPaint images can be included in GEOWrite documents.

GEOWrite is billed as a word processor, but its real strength is in its ability to combine different fonts and graphics. GEOWrite types in proportional text, in any of six fonts in several styles. It doesn't appear to be able to import text from non-GEOS word processor files, and it suffers from the need for disk access when you want to scroll sideways or through your document. Even at the vastly superior disk access speeds of GEOS, it's always a pain

to have to wait when you've got a brain-wave. I wouldn't use GEOWrite as an everyday word processor, but it is certainly useful for producing 'special' pages; for example, title pages, importing annotated graphics or diagrams and the like. The GEOS package is definitely going to eat into the sales of programs like 'Printshop', because of its higher-resolution result.

At 80 dots to the inch, GEOS is not likely to make significant inroads into the desktop publishing business, but for the newsletters of countless schools, clubs and smaller 'small' businesses it is going to become a standard. It supports most printers, but not, alas, Commodore's 1526/802 models. (I say *alas* because I've got one of these unsupported orphans).

GEOS will allow you to load non-GEOS programs from its desktop main menu, but to do so requires the creation of a special GEOS file on your program disk. This is no problem if you are booting one of your own originals, but with commercial software you run the risk of corrupting your disk when you write to it. For the time being, the most useful applications of GEOS are going to be the two that come with it.

GEOS retails for \$118, but buyers of new 64Cs or Family Packs receive a voucher which will give them a copy of GEOS for an additional \$20. A version for the C-128

is said to be in the works, but that's another story.

In many ways Commodore is at the same crossroads that Apple came to shortly after the release of the C64. Apple had its technically superior Macintosh pointing to the future, but the company was making money out of its antiquated Apple II's, a machine which was surrounded by technically superior and lower-priced 8-bit models. All it had in its favour was the huge pool of Apple II software and the existing user base. The Apple II not only survived but went on to earn its place as something of a hardy perennial. Even now you will find few who predict its demise.

Meanwhile

Commodore now has its innovative Amiga at the high end of the market, but it's still climbing the path to establishment. Meanwhile, in the company's traditional market, it faces renewed competition from the cost-cutting companies, such as Amstrad. Commodore is gambling that the 64C and GEOS, together with the huge and established C64 software base, will carry the day. If the Apple experience is anything to go by, Commodore has probably got it right.

Ian Allen has a closer look at the games in the Family Pack in his regular 'Your C64' column. □

Coloured Computer Paper

Now available in 3 different colours, yellow, pink and blue.

11 x 9 1/2 / 70 WORD PROC. PAPER

W250 Pack	250 sheets
W500 Pack	500 sheets
W1000 Pack	1000 sheets

Also available in boxes of 2,000 & 2,500

A4 WORD PROC. PAPER

A-4250 Pack	250 sheets
A-4 500 Pack	500 sheets
A-4 1000 Pack	1000 sheets

Also available in boxes of 2000

(Also pre printed STD Inv/stat formats.
All prices include S.T. Plus packing & postage)

11 x 15 PLAIN OR B.H.S

LP 250 Pack	250 sheets
LP 500 Pack	500 sheets
LP 1000 Pack	1000 sheets

Also available in boxes of 2,500

COMPUTER ADDRESS LABELS

37x102—	2000 Labels
24 x 89—	2000 Labels

Also available in boxes of 10,000

11 x 9 1/2 Coloured computer paper

One Colour Pack..... **250 sheets**

Candy Pack..... **400 sheets**
(100 sheets each colour, plus white)



In mini & micro packs available from leading computer stores now.

PHONE (03) 553 2100

DEALER ENQUIRIES WELCOME

**141 Herald Street,
Cheltenham 3192**

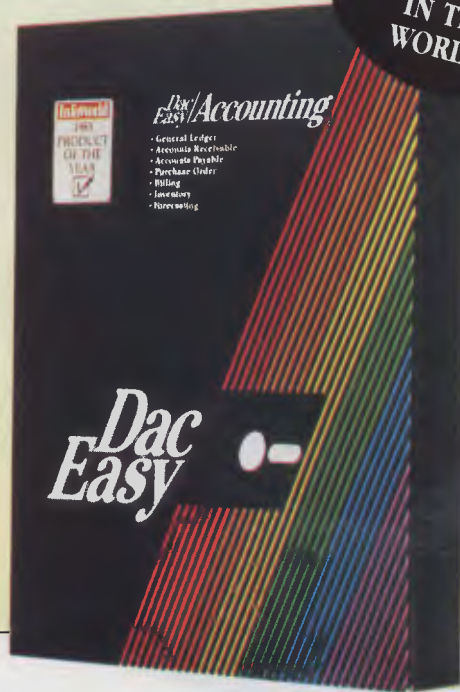
Dac Easy Accounting

(THE AWARD WINNER)

\$ 245⁰⁰*

Australian version

FASTEST SELLING ACCOUNTING PACKAGE IN THE WORLD!



Dac Easy Gives you Seven Full Feature Accounting Modules In A Single Integrated Package.

Accounting software doesn't have to be expensive to be the best. Dac Easy gives you a fully integrated accounting system with instant access to General Ledger, Accounts Receivable, Accounts Payable, Inventory, Purchase Order, Billing and Forecasting. Imagine, you can generate over 300 reports from 80 different routines . . . all in a non copy protected package. And, with Dac Easy you'll get a handsome slipcase binder with easy-to-follow documentation. Best of all, Dac Easy Accounting can be used to manage either service or product oriented businesses.

Find out for yourself why Dac Easy is the fastest selling accounting package on the market. Compare Dac Easy's features against other packages costing thousands more. Then order your Dac Easy Accounting by calling our toll free number or returning the coupon below.

General Information

- Menu driven
- Password protection
- File capacity limited only by disk space
- Support contract availability

General Ledger

- Unlimited # of accounts with multi-level accounting, unlimited departments
- 3 Year account history for CRT inquiry
- Pencil & pen feature to correct mistakes without reverse entries
- Unique budgeting routine (see Forecasting)
- CRT transaction inquiry, unlimited journals
- Activity report, trial balance, financial statements, etc.

Accounts Receivable

- Open invoice or balance forward
- 7 Customized columns for aging report
- Unlimited # of customers
- Mailing labels and directories with 4 different sorts
- Automatic finance charges
- Supports partial payments
- 3 Year customer history for # of invoices, sales, costs, and profits
- Customized text on statements
- Cash flow analysis
- Sales analysis
- Automatic sales forecasting by customer, salesperson or customer type

Accounts Payable

- Cheque printing and up to 10 invoices paid per cheque
- Automatic allocation of available cash to payables
- Vendor directories with sorting by vendor code, name, or territory
- Aging reports with 7 customized columns
- Unlimited # of vendors
- Mailing labels with 4 different sorts
- 3 Year vendor history for CRT inquiry and printing
- Flexible payment calendar
- Automatic forecasting of purchases
- Unlimited allocations per invoice

Inventory

- Supports average, last purchase, and standard costing methods
- Powerful physical inventory routines
- Accepts any unit of measure like fractions/dozens/gross/hours/minutes, etc.
- Automatic changing of costing methods
- Time and product inventory
- 3 Year product history in units, dollars, cost, and profits
- Automatic forecast of product sales
- Automatic pricing assignments
- Alert and activity reports with 11 sorts
- CRT shows on-hand/on-order/committed/sales/cost/profit/turns/GROI

Purchase Order

- Usable for inventory and non-inventory items
- Allows up to 99 lines per purchase order
- Per line discount in %
- Purchase Order accepts generic discounts/freight/taxes/insurance
- Purchase Order accepts back orders & returns
- Purchase journal
- Automatic interfacing with General Ledger, Payables, and Inventory

Billing

- Invoicing on plain or pre-printed forms
- Prints sales journal
- Automatic updating of committed products in inventory
- Ability to customize invoice for remarks
- Allows return credit memo
- Interfaces with Inventory, Accounts Receivable and General Ledger

Forecasting

- Unique program that automatically forecasts using your 3 year history
- Forecast revenue and expense accounts
 - Forecast vendor purchases
 - Forecast customer sales, cost, and profit by customer or salesperson
 - Forecast inventory item usage by 4 automatic methods
 - Forecast by same as last year, or % base from last year, or trend, or line analysis method

Minimum Hardware Requirements: IBM (PCjr, PC, XT or AT) or other compatibles, 128K memory, one 5 1/4 DSDD floppy disk, 132 column printer or 80 column printer in compressed mode, 80X24 CRT, MS-DOS[®] PC DOS[®] 2.0 or later.
* Trademarks of International Business Machines. * Trademark of Microsoft Corporation.

SOME OTHER GREAT WINNERS!

Dac Easy Word \$145

With Dac Easy Word you get a system that is so simple anyone can quickly learn to type and print a wide variety of documents, but you also get power . . . Mail merge, searches, windowing, dictionary, multiple justifications and much more.

Pop Up \$99

Pop Up the tool you need at the touch of a key! Full desk top utilities, financial calculator, word processor, pop up D.O.S., modem, daily diary, names, address, etc.

Dac Base \$145

A powerful, versatile relational database programme with many advanced features! Can read and convert d Base II files, can run existing d Base II programmes.

Festive Season Promotion

Promotion includes:
Dac Easy Accounting (Australian)
Dac Easy Word Dac Easy Base Pop Up
All your business will ever need for only \$499.

Dac Easy Accounting • Best Software . . . *Infoworld* • Trendsetting Accounting Product of the Year . . . *PC World* • Dac Easy is a genuinely amazing deal . . . *PC Magazine* • . . . I enthusiastically award four stars and recommend the purchase of Dac Easy . . . *Business Software* • I've never before in a review come right out and told readers to buy a product but I'm doing it now. Dac Easy is an incredible value . . . *PC Week* • Dac Easy offers the versatility and flexibility real accounting demands . . . *Personal Computing*.

MACE-SOFTWARE

STD free: (008) 77 7509

Land St & Sylvan Rd Corner
Toowong (Brisbane) Qld 4066.

Phone now or return the coupon provided.

Brisbane Enquiries
(07) 870 3600

MACE-SOFTWARE Land St. & Sylvan Rd., Corner, Toowong (Brisbane) Qld. 4066. Phone (07) 870 3600
Take advantage of our special introductory offer by ordering Dac Easy Software now. Simply send in this coupon with your credit card number, money order or cheque for the correct amount. Postage and handling are FREE (Overnight express).

(No C.O.D.)

CHEQUE MONEY ORDER BANKCARD VISA MASTERCARD AMERICAN EXPRESS

Account No. _____ Expires _____

Name _____

Address _____ Postcode _____

City _____ State _____

Phone _____ Signature _____

MAIL ORDER PRODUCT REQUIRED (TICK APPROPRIATE BOX)

Dac Easy Accounting \$245 Dac Easy Base \$145 Dac Easy Word \$145
 Festive Season Promotion \$499 Pop Up \$99

30-Day Money Back Guarantee: MACE-SOFTWARE provides a 30-DAY MONEY BACK GUARANTEE that all claims and features listed in this ad are true.

Win an APPLE IIGS!

Subscribe
(or Renew)
Before
28 Feb 1987
and
You could win this
APPLE IIGS!

What Can You Make of – APPLE II GRAPHICS AND SOUND?

Your Computer magazine has an Apple IIGS that we are going to give away to a new (or renewing) subscriber — and you could be the winner! All you have to do is rearrange (all or part) of the letters in the phrase APPLE II GRAPHICS AND SOUND to make another phrase or a sentence, like this –

★ GIRL ECHIDNAS PUN ★
HORSES RUNNING I LAUGH ON SHIPS ★
USE AN APPLE IN GRAPHS ★
LAUGHING SAND PIES ★
HIC, SAID THE REAL PIG ★

get the idea? We want a phrase or a sentence that uses only the letters in APPLE II GRAPHICS AND SOUND, and uses each letter only once in each different phrase or sentence (forward as many entries as you like.) Entries will be judged for originality, sense and imagery — and a bit of humor won't hurt. Make the phrases (or sentences) as long as you can — tie breaking will be on the basis of the number of letters used.

Too Simple ★ ★ ★

That sounds too simple, so let's have some rules –

- 1) Use only the letters in APPLE II GRAPHICS AND SOUND to make a new phrase or sentence.
- 2) Use each letter only once in each of your phrases (or sentences).
- 3) To be counted, the words must be listed in the Macquarie Dictionary; proper names and acronyms are not allowed.
- 4) All entries must be accompanied by a

valid Subscription Coupon to *Your Computer*; the competition is open to both new subscribers and renewals — so don't miss out! The Subscription Coupon is on page 131 of this issue.

- 7) Valid entries will automatically be eligible for any other current subscription offer (so you've got a chance to win the Charade, too!).
- 8) Everyone who likes a good computer magazine is eligible to enter — unless an employee of The Federal Publishing Co Pty Ltd or Apple Australia Pty Ltd.

9) There is no cash alternative to the prize (you're supposed to be a computer buff, right?).

10) To be eligible for judging, entries must be received before 28 February 1987.

11) Don't forget to put your name, address and phone number on your entry in addition to filling out the subscription coupon.

'nuff Said

Right? Now, write! Use that holiday time to win that APPLE IIGS and you've got the rest of the year for Graphics and Sound (and *Your Computer*, too!) □

KEEP YOUR EGGS IN THE SAFEST BASKET!

TANDON DRIVES

TM 262 –

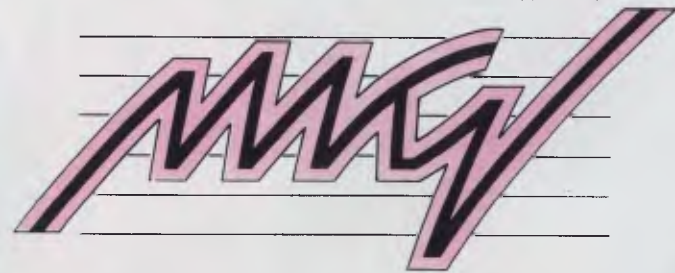
With an ordinary disk drive even a slight bump can be a disaster, damaging the head and resulting in catastrophic loss of precious data – and time. But not with the TANDON 262! The unique non-crash head, shock mountings and low inertia can withstand as much as 40G of impact, even during access, and that's – **THE PROTECTION YOU NEED!**

TM 755 –

This is the disk drive that proves that small and fast is beautiful. The Tandon TM 755 gives you 51M with rapid access and whisper quiet operation in a half height package.

As with all products from Micro General, our highly compact disk drives assure you of reliability and value for money.

MICRO • GENERAL



For the name of your nearest Dealer, call us today:

Micro General Pty Ltd

(Incorporated in NSW)

115 Church Street,
Camperdown NSW 2050
Telephone: (02) 550 2333

AN APPLE A DECADE . . .

Apple is celebrating its tenth birthday! Stewart Fist, an Apple aficionado almost since Steve and Steve (or was it Adam and Eve?) put Apples on the map, gazes deeply into the apple pie of things, to bring you the core of what's been going on in the orchard since it burst forth from the garage



W

HOWEVER SAID crime doesn't pay couldn't have known about Wozniak and Jobs. They turned a two-bit telephone rip-off device into a multi-million dollar empire. As the story goes, John Draper, known throughout the '70s counterculture as Captain Crunch had discovered he could generate tones that gave him free access to the phone

company's long-distance circuits. He used a whistle from a box of Captain Crunch breakfast cereal to make the tones — but that took considerable skill. His friend Steve Wozniak ('The Woz') designed an electronic tone generator which did the same.

It was quickly dubbed the 'blue box', and Wozniak and his friend Steve Jobs made a small fortune (by their standards at the time) selling these blue boxes to counterculture friends.

This year Apple, the company that grew out of this illegal activity, celebrates its tenth anniversary, and is still playing

Apple Birthday to You



David to IBM's Goliath in the world of microcomputers. It's the only real competitor to dominating blue rinse in which IBM has immersed the micro world. Wozniak was a man with self-admitted little knowledge of computer design at the time he built the first Apple, but he had a lot of native ingenuity. As he says about his design skills in 1976-77, "I didn't know it wasn't possible, so we went ahead and did it."

Legend has it that he used a processing chip produced originally as an 'auto-mat washing machine' controller (the 6502) because it was cheap. At \$20, the CPU was one-tenth the price of the Intel 8008, the only other usable 8-bit microprocessor at the time.

Bill Gates (of Microsoft fame) had already written a BASIC for the Altair — the first minicomputer kit, which was published in the January 1975 issue of *Popular Electronics*, so the micro revolution was already under way.

In Blessed Ignorance

Wozniak, in his ignorance, decided to write a BASIC for the 6502 and then later to design the machine to run it. His approach was a bit like designing the cockpit controls for an aircraft before designing the overall structure which enables it to fly.

But it worked, and became the Apple I, which shortly after became the Apple II. And Apple has remained an innovative company, often doing things the wrong way round, and constantly doing what hasn't been done before — on the premise that if there's no reason why something shouldn't be possible, perhaps it is.

The company still makes mistakes, but its innovations regularly bring IBM and the other lumbering clone-makers temporarily to their knees. The IBM world is still hard at work trying to design a user interface similar to that of the five-year-old Macintosh, and good colour graphics have come nearly eight years late to MS-DOS systems.

Still in its Birthday Suit

This year, with Apple celebrating the end of its first decade, the Apple II is still around, but as the II GS — a machine which appears to be as brilliantly

designed and as stunningly innovative as anything on the market since ... well ... since the Macintosh.

This is beginning to read like a spiel from Apple's own PR department, but it's not. I work all day in an environment dominated by MS-DOS, Unix, minis and mainframes, but I come home to write and program, by choice, on an Apple IIe. And I'm not alone; a couple of million other Apple users feel the same. (Apple recently sold its two-millionth Apple II.)

Like many other computer writers, I broke my baby-teeth on an early Apple II, and though I've upgraded a few times since, I have never seen the need to go the 16-bit path — until the GS came along.

I guess that if I'd been a junior executive working in a large multinational corporation, where playing in the sand-pit of forecasting spreadsheets was *de rigeur* for promotion, then I would have bought Lotus 1-2-3 and an MS-DOS machine to drive it — but I'm not, and I haven't.

So if you're looking for an unbiased view of Apple from a distanced, non-partisan observer, this article isn't for you. In my opinion the Apple II is simply the best machine ever made for basic computer education and small-business use — and my reasons are as much emotional as rational.

Again, I'm not alone in this view. The Apple cult has dominated the small-computer scene ever since Wozniak and Jobs wheeled the Apple II out of their Palo Alto garage.

Cult vs Business Culture

This cult-creation is the real story behind Apple. It's not merely a question of technical wizardry (though there was plenty of that), or of marketing expertise (though Apple shows its wheels to most high-tech marketers), but Apple's success has to do with why such a simple home-brew com-

puter continues to generate such loyalty and affection.

The emotional climate which has surrounded the company and the product is more the creation of Wozniak than of Jobs who ran the company for many years. Wozniak was the technocrat, but he never lost sight of his following. He built (and still builds) simple computers for enthusiasts, while Jobs became caught up in big-business culture and began designing computers for executives.

The difference of approach was the real difference between the two Steves in the period when Apple was developing into a fully-fledged member of the Fortune 500 companies; Wozniak remained a member of the counter-culture, while Jobs assumed the mantle of young-executive.

Wozniak continued to emphasise the importance of keeping the Apple II simple and versatile, advocating the need for open architecture and a simple user interface. He believed enthusiasts provided Apple's base in the world's computer markets, and that the maintenance of the Apple cult was all-important to the company.

Jobs, on the other hand, believed Apple should shake off its 'hacker' image and confront IBM head-on in the 'real world' business market. He was ready to abandon the long-term supporters of the company in favour of seducing new corporate users with high-level, powerful, and expensive, machines.

Jobs brought marketing expertise to Apple — but he didn't always use it very well. To give him due credit, he was a young, inexperienced executive under attack from IBM, one of the world's largest corporations and definitely a world leader in the marketing field.

Bobbing for Apples in a Sea of Blue

IBM very successfully sold the public on the idea that 8-bit computers were for home-hacker use only, and that 16-biters were needed for serious business use. The fact that most of these computers were used for word processing, and fact that IBM's own chip was an 8/16-bit hybrid didn't even embarrass Big Blue.

In retrospect, it's doubtful whether there was anything the IBM PC could do in its first two years which couldn't have been done better and more easily on an Apple II — and the Apple II had a much more extensive range of software. It is only in the past few years that

Apple Birthday to You



the IBM line has reached beyond the Apple.

The problems with the Apple II didn't come from its 8-bit data bus, or necessarily from its low-capacity disk drives — though a multi-megabyte hard-disk cult has now swept the corporate world. The problems arose from the fact that the 6502 (and later 65C02) microprocessor can only address 64 Kbytes of memory.

Modern, memory-hungry software requires two to 10 times that amount, so the Apple II couldn't run today's more elaborate business software without employing some 'tricks', and business users saw it as being incapable of doing serious work.

Apple partly solved the problem of the II's memory in 1983, when it introduced the IIe, which has one expansion slot different from the others. This is called the auxiliary slot and is tied directly into the motherboard's video-generation circuitry.

Even more importantly, Apple built support for bank-switching (using the auxiliary slot) in to the motherboard, by tapping directly into the memory-management unit. Bank-switching allows the micro to access multiple 64 Kbyte banks of memory, and therefore to appear to handle much larger memory addresses than seems possible.

Under bank-switching, only one bank of 64 Kbytes can be active at a time, but with skilful programming, some large and powerful programs can be made to work on bank-switched machines.

In the standard business configuration, the IIe is fitted with an 80-column card, which provides both the second bank of 64 Kbytes of memory and the 80-column screen display. And in the past few years, RAM and memory-expansion cards with up to four megabytes have been added to the machine — though not all of these work in exactly the same way, or with all software.

So, from a technical point of view, Wozniak's emphasis on providing slots paid off, and while a whole range of the early competing machines gradually faded into distant memory, the Apple II series kept on.

Compromise — The Worm in the Apple

For a while, the Jobs-Wozniak partnership existed through compromise. The Apple III and the Lisa provide testimony to both

points of view. Wozniak kept pressing the open-architecture principle, but slots are expensive to provide, and Apple was constantly being undercut in price by machines like the Tandy and Commodore.

Without slots, the basic machine was much cheaper — but you pay more than the difference every time you try to add to your system, since the machines have to be returned to the maker for soldered modifications.

Jobs could also see the economic sense (from the company point of view) of having control over all upgrading and modifications to Apple machines — a system Tandy had taken to the extreme. Why let the user make the modifications when you can cut initial purchase costs, then charge for the upgrades?

Wozniak, on the other hand, felt open architecture encouraged development by enthusiasts and third-party developers, and that this, in turn, fed free research and development back to the company.

In the short-term Jobs was right. Price-cutting became essential, and the enormous range of semi-standard add-on boards created a nightmare for further development of the Apple II series. Any company upgrade of the motherboard guaranteed that around 50 per cent of the old plug-in boards wouldn't work.

The Lisa was the last of the machines to be designed with roughly equal input from the two founders, but by this time the partnership was beginning to crumble.

In the shakeout, Jobs, with the support of his business associates, dominated, and it was during the ensuing period that the Macintosh and the Apple IIc — both with closed architectures and aimed at business users — came into being.

Wozniak remained at Apple for a while on a part-time basis, and worked on the design of a super-Apple IIx, which has now

surfaced as the GS. Jobs took the Macintosh under his wing and gradually squeezed the Apple II development and Wozniak out.

Listen Mac, the GS Came First

It's not generally known that the GS was in the early design stages back in 1983 when the Mac was moving from concept to reality, but when Wozniak left the company Jobs put the GS on the back-burner. So while the new GS may look as if it has taken technology from the Mac, it in fact gave as much as it took.

The GS, thus named for its graphics and sound capabilities, has at its heart a microprocessor chip developed by Bill Mensch at Western Digital.

Mensch has designed numerous advanced forms of the old 6502 chip, but none more significant than the, 65816 which is a true 16-bit processor, able to address up to 16 megabytes of RAM. Even more to the point, it can still be used in an 8-bit mode, where it is able to emulate the 65C02 chip of the IIe, and therefore run about 90 per cent of all available Apple software.

When Sculley replaced Jobs at the top of Apple, he had enough sense to realise the Apple II series still had a lot to offer, and he bought Wozniak back to complete the GS project. So the GS remains a true member of the Apple II series, while at the same time providing a bridge to the Macintosh world.

The emphasis on open architecture is back, while the ease of use provided by the Mac-and-mouse interface has been retained. Apple II GS users now have the best of both worlds, and with the new open-Mac due to be released next March, the two lines are being merged into one.

Sculley has also turned Apple's R&D skills to the problem of MS-DOS compatibility, and both the Mac and the GS should have a plug-in MS-DOS card to run IBM software within a year.

Multi-function cards are helping carry the II series into the next decade. In addition to MS-DOS, CP/M, Unix, memory expansion, and a whole range of other functions, these boards offer serial and parallel interfaces, clocks, red-green-blue colour capabilities and many other features.

So after 10 years, we're not only wishing Apple a happy birthday, but we can confidently wish the II family many happy returns. □



Programming Solutions can be as elusive as the Cheshire Cat.

Alice will help you through the Pascal maze.

To a lot of people, computer programming is a Wonderland inhabited by March Hares and Hatters, speaking a language of their own, and about as accessible as Lewis Carroll's strange looking-glass world.

Though now, if you own an IBM or compatible personal computer, you've got a personal guide - ALICE: The Personal Pascal.

ALICE is a unique and powerful piece of software which enables you to write your own programs, and introduces the world of Pascal, the computer language. For the novice, ALICE makes learning Pascal simple, with an "intelligent" editor making the mechanics of writing a Pascal program nearly as easy as "filling in the blanks". Experienced programmers will find ALICE's interpreter the most advanced source-level Turbo Pascal de-bugging tool available.



and syntax verification as you go along - ALICE won't let you make a mistake!

"I can't explain myself, I'm afraid, sir," said Alice...

Our ALICE certainly can explain herself. In fact, explaining is one of her biggest features. Contact us, and let ALICE be your guide to the Wonderland of computers. Available through Microway or your local dealer at a price that makes ALICE truly wonderful. Recommended Retail \$214.

Write or call us now, and we'll send all the literature and a Demonstration Disk at the cost of \$12, in which ALICE explains everything about this unique and powerful piece of software.

"What is the use of a book," thought Alice, "without pictures or conversations?"

The same comment applies to a programming environment - ALICE provides over 500 "Help!" screens, with context-sensitive help, ranging from "What can I type here?" to "What program called up this sub-routine?". At the same time ALICE provides immediate assistance with problems, instructing the user about Pascal - so programming gets easier and easier.

"That's the reason they're called lessons" remarked the Gryphon: "they lessen from day to day."

There are no language tricks, because ALICE knows all the rules of Pascal. This allows you immediate type



MICROWAY
The Pascal Specialists

292 Chesterville Road, Moorabbin 3189. Phone (03) 555 4544

Yes, please rush me a copy of all the literature sample disk ALICE
 Please charge my Master Bankcard Visa (please incl. \$8 post.)
 Cheque enclosed.

Card No.
Name
Address
Ph:

Expiry Date

P C

Signature

ALICE
The Personal Pascal

BULLETIN BOARD NEWSFLASH

Believe it or not, for business or for pleasure, more spectacular than ever, the *Your Computer* Bulletin Board is back with Bells on.

Find that hard (disk) to imagine? Well, how else would we be able to share our **50-plus megabytes** of neatly catalogued **public domain software**. Even with our new whizz-bang ever-whirring fixed drive (yes, you heard right) we'll have to rotate all that soft stuff in 10 megabyte batches . . . Then we'll still have room to slap up:

- ☞ The regularly updated, cross-referenced, five-year index to *Your Computer* articles.
- ☞ Our database of the new products listed in the magazine each month.
- ☞ Sample programs from dLetter.
- ☞ Many of those useful bits of code we publish in the magazine - yours for the downloading.

And there'll be space for you to send us words of greeting, praise and bribery allsorts. Old-time users of the YC BBS, who've been on hold for the past few months, will also enjoy the

REVISED MESSAGING SYSTEM

NEW PHONE NUMBER - (02) 953 8074

NEW DOCUMENTATION

(Send us your name, address and member number, and we'll send you a copy.)

For showing extreme patience in the line of membership, existing users have been awarded at least six month's free access (depending on when you joined up), from this date.

Visitors are welcome, but are asked to observe dress regulations at all times.



Name: _____

Address: _____

Suburb: _____ P/C _____

Yes, I want some! Here's my \$30, by:

- Cheque/Money Order, or
- Bankcard
- Mastercard

- Visa
- American Express

Credit Card No.: _____ Expiry: ____/____ Signature: _____

(Unsigned credit card orders not accepted)

Mail your application, FREE, today:

Freepost No 4,
The Federal Publishing Company Pty Ltd,
PO Box 227,
Waterloo NSW 2017.

BETTER FOR MICROS



Now there's an exciting new world for Personal Computer owners to explore. The world of Microtex 666 on Telecom Viatel.

All you need is a 1200/75 baud modem, the appropriate software, and a telephone line, and your PC will be ready to go.

Suddenly you'll be able to shop for software on your PC, and actually download it directly through the Viatel system. You'll be able to get PC advice and tips. Even place messages on the system for other Viatel users to read and respond to – literally a PC talkback service that lets you have a say on almost any subject.

That's just part of what Microtex 666 offers. And Microtex 666 is just part of what Telecom Viatel offers. You can also bank with Viatel, place bets, buy and sell shares, book travel, and much more. Instantly, easily, economically. 24 hours a day.

Ask for a free brochure at any Telecom Business Office. And start using your micro in a whole new, better way.



Telecom Australia
Better for Business

TM657C

SUBSCRIBE

receive **A FREE AM/FM**
and your chance to **WIN A**



CONDITIONS OF ENTRY

1. Entries close last mail February 27, 1987.
2. Entry to the prize draw is achieved by returning a completed subscription card and payment. Entry is open to both new and renewal subscribers.
3. Entry is open to all residents of Australia other than the employees and immediate families of The Federal Publishing Company Pty Ltd and Daihatsu and their associated agencies and publications.
4. The draw will take place on March 4, 1987, and the winner will be notified by mail and the result published in The Australian newspaper date March 13, 1987, and a later issue of the magazine.
5. Prizes must be taken as offered. There is no cash alternative. Prizes are not transferable and cannot be altered in any way.
6. The vehicle prize of a Daihatsu Charade includes all on-road costs, including third party insurance and registration.
7. Federal Publishing will arrange delivery of the vehicle within Australia within one month of the winner being drawn. If delivery is required outside of Australia, this becomes the responsibility of the winner.
8. Permit No. T.C. 86 2203 issued under the Lotteries and Art Unions Act 1901, Raffles and Bingo Permits Board Permit No. 86 1013 issued on 15/9/86, ACT Permit No. TP86 650 issued under the Lotteries Ordinance, 1964.

• The Pace • The Feel • The Space • The Ride

• The Luxury • The Style • The Econ

NOW!

Your Chance to Win
A New **APPLE IIGS**
Is on Page 122!

WEATHER PROOF RADIO "CHARADE" from "DAIHATSU"



FREE RADIO
with all new or renewed subscriptions



- ★ AM/FM Radio
- ★ All Weather Speakers
- ★ On/Off Volume Control
- ★ Tuning Control
- ★ Bicycle Mounting Bracket
- ★ Handy Carry Strap
- ★ Operates on 4 x "AA" size batteries (batteries not included)

(1. The "Free Radio with Paid Subscription" offer expires last mail, February 27, 1987.
2. Faulty radios not returned to The Federal Publishing Company within 60 days of receipt cannot be exchanged.)

LIMITED OFFER, SO POST SUBSCRIPTION CARD TODAY!!
(If card missing, please phone (02) 693-6666 and ask for the Subscriptions Department).

"Daihatsu. That's who."



SUBSCRIPTION COUPON

You'll get 12 issues of **Your Computer**
PLUS a FREE WEATHERPROOF
AM/FM RADIO. Plus YOUR CHANCE
TO WIN A FABULOUS DAIHATSU
CHARADE!!!

Please send me this special offer of 12
issues or 24 issues of Your Computer
magazine (one each month), together with
my WEATHERPROOF AM/FM RADIO.

I enclose my cheque/money order
with this coupon in an envelope

for \$35.40 or \$64.00.
(NZ 1 year Air \$A57.00 Sur \$A51.80)
OR charge my
 Bankcard Visa Amex Mastercard

(Offer applies to new and renewal subscribers received
between 1/1/86 and last mail on 27/2/87.)

Card No. Expiry Date:.....

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Signature:.....
(Unsigned credit cards cannot be accepted)

Name

Address

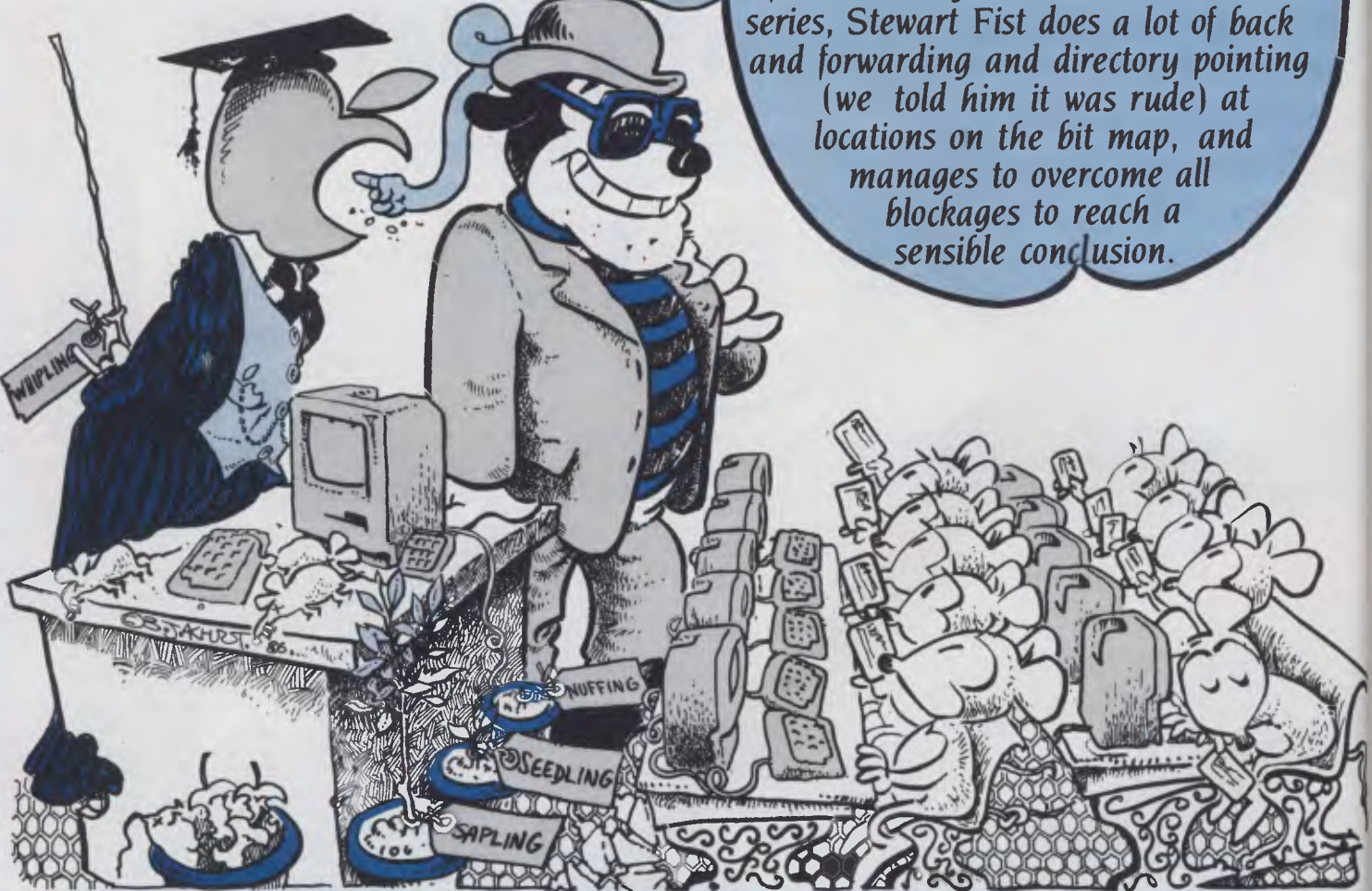
..... Postcode.....

mail FREE to:
Freepost No. 4, P.O. Box 227, Waterloo 2017.

• The Ride • The Space • The Feel • The Pace

Economy • The Options • The Safety

Great jumping block numbers! Where did all those gaps come from? In this continuation of the 'Putting ProDOS in its Place' series, Stewart Fist does a lot of back and forwarding and directory pointing (we told him it was rude) at locations on the bit map, and manages to overcome all blockages to reach a sensible conclusion.



BYTING PRODOS BACK - Part 3

IN PART TWO, WE jumped a bit ahead of ourselves by looking at the formatting commands in Appleworks. We haven't yet finished dealing with the way the ProDOS system allocates and controls its disk space.

Remember the primary directory is at Block 2, and ProDOS supposedly allocates available space strictly in order from the lower free to the higher block numbers. One block equals two of the old disk sectors.

Figure 1 is again the main Directory block as it appears on Pro-Byter. And to give you an overview of what's on my example disk we have Figure 2, which is the disk map produced by Pro-Byter.

Ignore the Track column on the left — we are interested only in the blocks. Pro-byter uses a '+' sign to signify that a block is in use, and a '' to show that it is either empty or available for use.

You can see from this map that the first 23 blocks are in use, then 16 blocks are free, followed by a further 31 blocks in use. If ProDOS strictly allocates space in order, from the lowest to the highest block numbers, why is there gap of 16 blocks in the middle?

A glance at the directory block gives you the answer. YC.PRODOS (which is an Appleworks W/P file) has been changed and saved again, so the space previously occupied by it, is now vacant.

There have been a number of other changes that aren't apparent, but which make interpretation of the map rather confusing. For instance, the directory (Figure 1) shows that the Appleworks database file ADDRESS.FILE begins at Block \$0800 (decimal 8) and is \$1E (31) blocks long.

There's a curiosity here that I don't understand — but here are the facts as they relate to Appleworks files, anyway. ProDOS takes up the first seven blocks, from \$00 to \$06, with \$06 the bit map which keeps a running record of which disk blocks are used and which are still available.

Now, the first file on the disk starts at

```

00 00 03 00
-----
F9 DEMO.DISK::::: 00 0000 0000 000000
0000-0000 00 00 C3 270D 0300 0600 1B01
-----
2C ADDRESS.FILEEMP 19 0800 1E00 573800
FCAC-0000 00 00 E3 7E70 FCAC-0000 0200
-----
1B SEEDLINGKS.TEMP 1A 1600 0100 4B0100
FCAC-0000 00 00 E3 0000 FCAC-0000 0200
-----
00 YC.PRODOSS.TEMP 1A 1800 1000 E01C00
FCAC-0000 00 00 E3 2000 FCAC-0000 0200
-----
29 YC.PRODOSS.TEMP 1A 3700 1000 CC1D00
FCAC-0000 00 00 E3 2000 FCAC-0000 0200
-----
00 ::::::::::::::: 00 0000 0000 000000
0000-0000 00 00 00 0000 0000-0000 0000
-----
00 ::::::::::::::: 00 00

```

Figure 1. The main Directory block. Note that YC.PRODOS has been changed and saved since Figure 1 in Part 2.

PRODOS (TM) BLOCK MAP			
TRACK	01234567	89ABCDEF	
\$00-01	\$0000++++++	++++++	
\$02-03	\$0010++++++	.....
\$04-05	\$0020.....+	++++++	
\$06-07	\$0030++++++	++++++	
\$08-09	\$0040++++++	.....
\$0A-0B	\$0050.....	.....
\$0C-0D	\$0060.....	.....
\$0E-0F	\$0070.....	.....
\$10-11	\$0080.....	.....
\$12-13	\$0090.....	.....
\$14-15	\$00A0.....	.....
\$16-17	\$00B0.....	.....
\$18-19	\$00C0.....	.....
\$1A-1B	\$00D0.....	.....
\$1C-1D	\$00E0.....	.....
\$1E-1F	\$00F0.....	.....
\$20-21	\$0100.....	.....
\$22	\$0110.....	.....

BLOCKS USED (+):54 / FREE (.) :226

Figure 2. The disk map produced by Pro-Byter for the example disk.

\$08, but from the disk map we can see that \$07 is in use. What with? When I did a trace of the ADDRESS.FILE file I found that it jumps from the directory, to Block \$08, then back to \$07, then on to \$09.

This jump forward, the back and then forward again seems to happen on all Appleworks files, but all the books say that ProDOS allocates all blocks in strict order from the bottom up.

I don't pretend to understand this apparent contradiction, but it seems to apply to all files — except seedling files, of course, which are only one block in length. It is obviously a peculiarity of Appleworks rather than ProDOS.

ADDRESS.FILE is a database file, but the same applies to all Appleworks word processing files as well. The directory pointer points to the block reserved (in

the longer files) as an index for that particular file. You can see the top couple of lines on Figure 3, which is a printout of Block \$08 Part A.

```

::::::::::::: 07090A0B 0C0D0E0F 10111213
:: (*+,-./0 14152728 292A2B2C 2D2E2F30
12345::::: 31323334 35000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
::::::::::::: 00000000 00000000 00000000
BYTE VALUE c@ BLCK: 1 OF 30
44 ($2C) 0 ($00) @ 8 ($08) A 2

```

Figure 3. A printout of Block \$08 Part A of the ADDRESS.FILE.

From the left we see the file first uses Block \$07, then jumps to \$09 and runs progressively to Block \$15. It then jumps to \$27 and continues on until Block \$35. The second jump was probably due to another file getting in the way at the time of recording.

The index block actually uses two sectors at a time. Part B on this disk is nothing more than a series of \$00s, but there could be some \$01 in here if I had a full disk, or I was using a hard disk.

The program takes the least significant byte from part A (in this case \$07 ... \$09 ... and so on) and the most significant byte from Part B (in this case they are all \$00s).

With this Appleworks database file, the actual information didn't start until near the end of Block \$0A. Both \$07 and \$09 were occupied with the database formatting information.

With word processing files, only one block is reserved for format information, and the data starts at the top of the next block.

As I've noted before, Block 6 (Figure 4) on a ProDOS floppy is reserved for a bit map, and for those of you who haven't come across a bit map before, I'll describe it in detail. You need to know how it works if you are going to repair the damaged files.

You can see that the sequence goes: \$00 \$00 \$01 \$FF \$FE \$00 \$00 \$00 \$03 ... followed by a whole log of \$FFs. These

```

:: ~::: 000001FF FE000000 03FFFFFF
: FFFFFFFF FFFFFFFF FFFFFFFF
::: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
: 00000000 00000000 00000000
BYTE VALUE c@ BLCK: 1 OF 30
44 ($2C) 0 ($00) @ 6 ($06) A 2

```

Figure 4. A printout of \$06 — the bit map — of the ADDRESS.FILE. Compare this with the disk map in Figure 2.

\$FFs are added when the disk is formatted, so they establish the length of available space on the disk. You can see that, with two parts, this block of bit map can handle a fair amount of disk space.

In binary, the hex \$00 translates to eight zero bits (00000000) and is repeated twice. Hex \$01 is binary 0000 0001, while \$FF is eight ones, and FE seven ones and a zero.

If you space these out in groups of eight in table form, you get the following pattern:

```

00000000 00000000
00000001 11111111
11111110 00000000
00000000 00000000
00000011 ... and so on.

```

As you can see, this corresponds exactly to Pro-Byter's disk map in Figure 2, which is understandable since this is where Pro-Byter took its information from. The only oddity is that zeros are used to mark the presence of information in a block, and ones represent availability.

As the disk is over-written by changes and fresh files are added, this disk map is constantly changed. You can represent any combination of zeros and ones in an eight-bit group by choosing the right hex number.

The computer refers to this map before writing any information to a disk. The map doesn't play a part in reading from a disk — the computer has to refer to the individual file indexes since this records the sequence of blocks used — but for writing to the disk, the computer only has to find those blocks which are available, and these are any on the disk-map represented by a one. □

C FOR SMARTIES

EARLIER, WE REFERRED TO Boehm and Jacopini's paper on structured programming, and we discussed several different kinds of flow control in the C language. However, we omitted a discussion of the most important of all: the function.

Functions are an important part of any modern programming language, as they are the foundation on which the programming concept of abstraction is built. In other words, when we design a program, we break the problem up into bite-sized pieces, each of which is soluble by a single programmer without working until 3 am.

This is the most important idea in good programming practice. If we can simply break a problem up into its constituent parts, using a strategy of divide and conquer, we are bound to be able to solve the whole problem without major drama.

Functions are designed to support exactly this idea.

The main programs we have written and examined so far have consisted of a single function — `main()` — and that's all. However, more complex programs will consist of many functions, which may even be kept in separate files and be separately compiled.

Library Functions

So far in this series, we have used several library functions. Your compiler manual should document the library functions supplied with the compiler, which are the standard (K&R) functions together with some that are unique to that particular compiler. I'd like you to take a look at these now.

You'll see that all functions, whether they are passed a parameter or not, are distinguished by the appearance of parentheses after the function name. If any parameters are passed to the function, they appear between these parentheses; if there are none, the parentheses still appear. That's how the compiler distinguishes between functions and variables, and why arrays are specified with square brackets.

In the description of some functions, you'll see an `#include` statement. This means the function uses a structure or definition from the named header file, and will not work unless the `#include` line is placed in your program.

Les Bell continues his sojourn through the intricacies of the C programming language, with a discussion of functions and scope rules. (You can't say no - si, si.)

Notice also all functions are specified to be of a particular type. That is the type of the result returned by the function. Some functions do not actually return a type, and these are usually specified of type `int`, although the modern trend is to give these a type `void`.

The returned value is sometimes the desired result, and sometimes a side-effect: for example, an indication of success or failure.

If a library function is used in a program without any type being specified for it, the compiler assumes it returns an `int` value. If you use a function which returns something else — say a pointer or float — then your program will probably collapse. Occasionally you will get away with it; you can sometimes treat pointers and ints as interchangeable, but it will cause you grief sooner or later.

Watch out also for functions which you would generally classify as floating point and naturally define as type `float`, but which actually return a double result. This can cause you problems.

If you want to store a double result in a float variable, or a long in an `int`, you can force the compiler to change the precision for you by using what is called a type cast. A cast is simply a type specifier, enclosed in parentheses, before the variable or function you want to convert.

If parameters are passed to a library function, it is the responsibility of the programmer to ensure they match in type with those specified in the function definition. Passing float values to a function which expects ints (or vice versa) will result in a crash. Casts will be helpful here.

Note some functions (most notably `printf`, `scanf` and their relatives) will accept a variable number of arguments. This involves some trickery on the part of the compiler — you cannot write functions to do this yourself.

User-written Functions

The major advantage of functions, as mentioned above, is the ability they give a programmer to abstract from a complex concept to a series of simpler ones. To this end, programs of any reasonable complexity should be written as a hierarchical set of functions.

A function definition is rather like a declaration for a variable. First comes the type of the function, then its name, followed by any parameters it will accept, in parentheses. On the next few lines, these parameters are declared, then the body of the function is opened with an opening (left) curly brace, and the function definition follows.

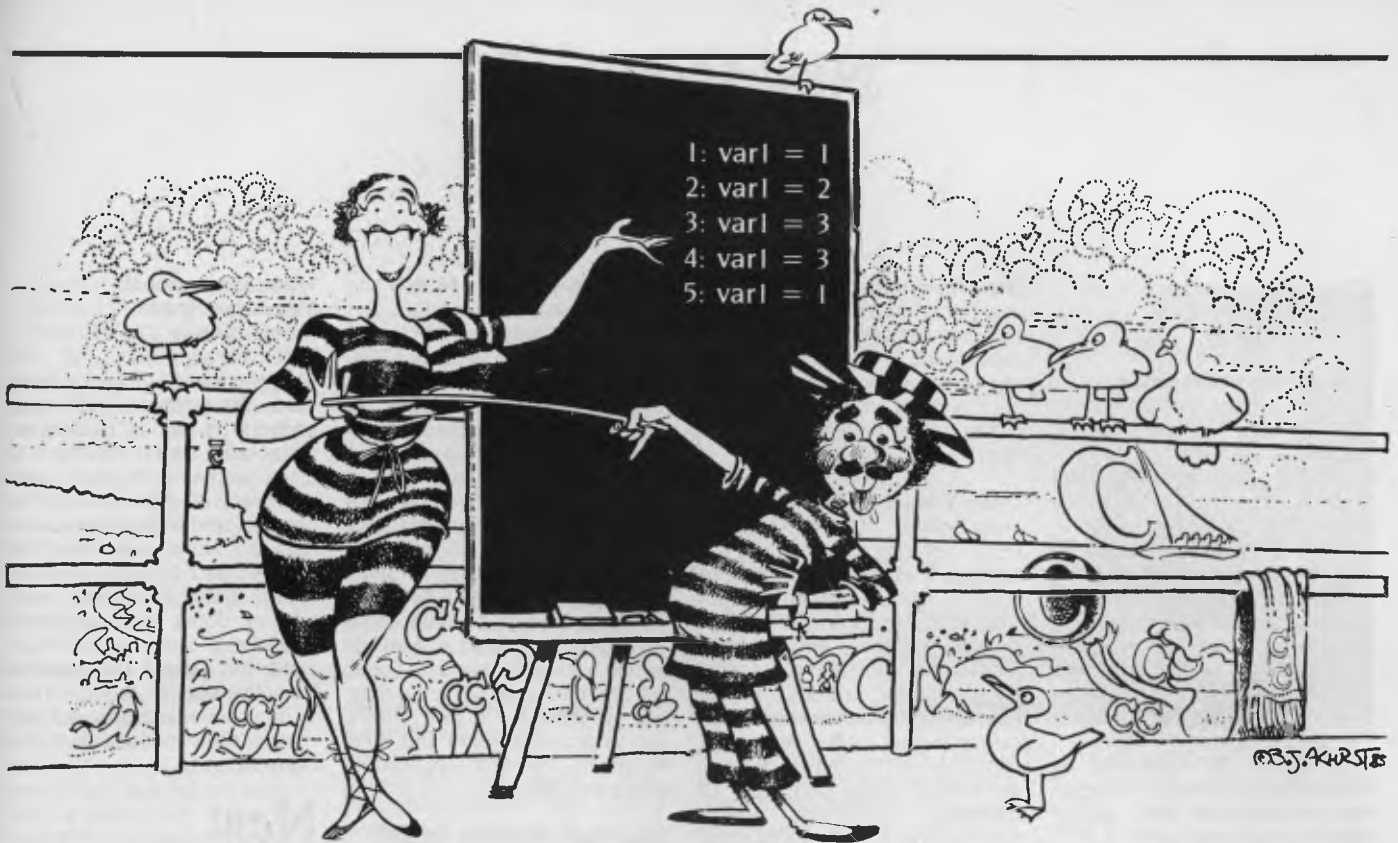
Scope Rules

Variables declared inside the body of a function are local to that function; that is, other functions have no knowledge of them, cannot access them, and most importantly, cannot change them. This also applies to the parameters declared just before the body of the function.

If a variable is declared outside the body of a function — whether the main function or some other — it is then a global variable. Global variables are known to all functions which are compiled together in the same file. If, however, functions are compiled separately, they cannot know of the existence of a global variable.

It is possible to over-ride this by declaring variables with the keyword `extern`. The `extern` keyword tells the compiler not to reserve storage for a variable in the current function (it is stored elsewhere), but the function does know about its name, type and storage location. The actual location will be resolved at link time.

C always passes parameters by value. This means the variables you use as parameters inside a function are *copies* of the parameters passed to a function. Changing these copies does not change the originals in the calling function. So the code in Figure 1 will not work.



```

/* Wrong way to increment a variable */
main()
{
    int num;

    num = 5;
    inc(num);
    printf("After incrementing, num is now %d\n",num);
}

inc(var)
int var;
{
    var++;
}

```

```

int var1 = 0;

main()
{
    int var1 = 1;
    printf("1: var1 = %d",var1);

    {
        int var1;
        var1 = 2;
        printf("\n2: var1 = %d",var1);

        {
            var1++;
            printf("\n3: var1 = %d",var1);
        }
        printf("\n4: var1 = %d",var1);
    }
    printf("\n5: var1 = %d",var1);
}

```

The answer is pointed out at the beginning of this Tutorial — if it doesn't make sense, try drawing lines linking the various curly braces, and try deciding which particular incarnation of var1 is 'alive' within each scope. It's easier to visualise than to explain, I'm afraid.

Exercise

Try the program in Figure 1 and verify that it does not work. Add a printf() statement inside the function inc() to print the value of var. Is it being incremented?

There are at least three ways to modify this program to make it work. First, we could make the inc function return a value. Modify the program to do this.

Another way is to pass a pointer to the

integer we want incremented, and have the inc function increment it *in situ*. Try this way of doing it.

How could you use the scope rules to get it to work?

Blockheads

Another important point which many programmers forget is that C is a block-structured language. This means that within blocks — that is, sections of code which are delimited by curly braces — it is possible to declare variables which have existence only within that scope, and which may, if necessary, redefine variable names already in existence in a containing or surrounding block. This means it is possible to use common names, such as i, for loop counters with relative impunity, through the use of curly braces.

With this in mind, what does the program in Figure 2 print?

Gaps in Parts?

MISSED PARTS of any of our YC Tutorials? Well, you've got a second chance — We'll forward photocopies of any Parts of any Tutorial we've published in the last 2 years for \$0.50 per Part plus \$4.00 post and handling within Australia (overseas postage additional). Please identify the Tutorial by its complete name and specify your missing Parts (of the tutorial). All but the latest of our Tutorials are listed in YC's 5-Year Index, published with our July 1986 issue: refer to the Services page on how to obtain Back Issues. (We've always got to read Les at least twice.)

Software

'Superb' Superannuation

Co-Cam Computer Services,
(03) 420 5400

Price: Not supplied

Superb superannuation package is designed specifically for the internally administered superannuation plan with between 50 and 10,000 members. By bringing this function inhouse, administrators can achieve flexibility in placing invested funds, with standard PC-style hardware. The outstanding feature of this program is the 'Benefit Formula Definition' capability, which effects large-scale economies by eliminating the need for computing professionals with specialised programming skills.

All-Singing All-Dancing Software

Roland Corporation, (03) 241 1254

Price: Not supplied

A complete series of music-teaching software, developed in Israel, lets students learn both how to play a keyboard, and singing, at their own pace, through a new technique which enables the computer to 'hear' and react to the student's efforts. Using instruments and microphones attached to an IBM PC, the Musicom courses enable students at different levels to learn and practice music correctly at their own pace. ▽



Asset Control Package

CCH Australia, (02) 888 2555

Price: Not supplied

CCH Software offers a package designed to track and register all your company's assets. (I can do that on the back of a bus ticket). Func-

tion key-driven for easy input and minimum operator training, it is not designed solely for the accountant. It allows easy tracking of a vast number of assets, such as plant and equipment, recorded either by branch or property.

Clinic 2 Medical Software

Medix Software, (02) 449 9162

Price: Not supplied

Version 2 of an already-proven software suite for doctors, specialists, hospitals and so on, this package enhances already comprehensive clinical record systems with a powerful billing module, at no extra charge. Featuring 'instant billing' at time of consultation onto either plain or pre-printed stationery, or to medicare bulk-billing forms, Clinic allows the recording of all payments, including those made by credit cards, and processes the banking record on two-part paper.

MOPI Universal Assembler ▽

Ptizan Computer Services,

(062) 58 6823

Price: Not supplied

Just released in the United States, MOPI (Macro Oriented, Processor Independent) is a new assembler program which can generate machine code for any 8- or 16-bit and most 32-bit microprocessor. It produces .COM .HEX or .RLM files, and removes the need for cross assemblers. By its design nature, it can be read-

ily used to program experimental processors. It can also operate on code written in manufacturer's mnemonics, or a new standardised set of universal mnemonics, and can produce job documentation.

PC-Eighty, CP/M for 16 Bits

FBN Software, (062) 86 1102

Price: \$140 (includes V20 chip)

PC-Eighty allows users of CP/M 2.2 to run their 8-bit program on their new 16-bit machines. It uses a V20 chip (supplied), which replaces the CPU chip, and the software allows easy transport of existing programs over to the new format. CP/M effectively runs as a 'Task' under DOS, allowing resident program, such as Sidekick, to be used with CP/M. The interface provides a full 64 Kbyte CP/M system, a RAM disk of up to half a megabyte and optional use of a hard disk. While running one application, Eighty allows you to access another and then return to the first application where you left it.

Smartstuff, Resident Utilities

FBN Software, (062) 86 1102

Price: \$104

Described as a second-generation version of the Sidekick idea,



this package is a collection of 'pop-up' desk tools which you can tailor to your needs. Each tool can be loaded separately, to save memory. Smartstuff includes a powerful resident screen editor/notepad, a programmable calculator, an advanced financial calculator, a calendar alarm clock, a dialler, and a DOS command menu giving access to common DOS commands from inside an application programme.

Three Dimensional Measuring System

Adam Technology, (09) 470 2322

Price: Not supplied

With this newly developed software, three-dimensional measurement, known as photogrammetry, falls within the reach of many more computer users. Basically, it depends on two photos taken from known points from the subject, which are then scanned and accurate measurements obtained. Previous methods of doing this demanded specialised cameras and equipment, but Adam's technique allows the use of normal 35 or 70 mm cameras and the software compensates for lens distortion characteristics.

New Machines

Multistar 4

Computer Micrographic Services,

(07) 52 9966

Price: under \$5000

The Multistar 4, by IBC, has been released in Australia, and offers an 8 Mhz Z80A CPU with 256 Kbytes of RAM, a hard and floppy disk controller, four serial and one parallel port. Able to compete with the low-end IBM system 36, it includes a real-time clock, an honest cache memory system and true user-accounting, logon, security, print spooler and minicomputer-like executive programs.

Datatel DPC Range of IBM Compatibles

Datatel, (03) 690 1000

Price: From \$1568

Locally assembled and fully IBM



NEW PRODUCTS

compatible, the new range starts with the DPC-88, an XT turbo unit with 256 Kbytes RAM, 8 Mhz 8088, dual drives, colour card, parallel port, 150 watt power supply and 5151-style keyboard. Next is the DAT-286, an AT-style machine with 512 Kbyte RAM, an 80286, single slimline floppy and 20 Mbyte hard disk. This unit has a recommended retail price of \$5410 and includes a high-res graphics card, a 200 watt power supply, security locking and a slide-top cabinet.

Gridcase Plus Laptop

Vicom Australia, (03) 529 8270

Price: Not supplied

This is claimed to be the first battery-operated laptop with an internal hard disk option, and includes a redesigned 71-key keyboard and an enhanced yellow or light-emitting plasma display, making the unit ideal for field applications. The Gridcase Plus has 1 Mbyte of ROM and 10 Mbytes hard disk capacity. Options include serial and parallel ports, an internal modem, RGB output and an IBM expansion box to access LANS.

Microbee Terminal

Microbee Systems, (02) 886 4444

Price: \$828 plus monitor (B/W \$149, colour \$448)

The Teleterm, from Microbee, is a compact package which performs most of the information processing and communication functions required in the modern office, at a price far below what was previously possible. This is designed as a data terminal, but also includes a word processor,

and a suite called 'Offsider' with pop-up utilities such as a phone index, clock/calendar and notepad. A built-in modem, pushbutton phone, 92-key keyboard with 12 programmable function keys and numeric key pad, together with all basic functions in ROM, make this an ideal Videotex station. Both 300/300 and 1200/75 baud rates, plus autodialling, mean the Teleterm can stand alone in an office environment where text handling and communications would otherwise demand a full-sized and full-priced computer.

New Model BBC Compact

Barson Computers, (03) 419 3033

Price: From \$1332

Barson has announced a slimmer, more powerful BBC, with a lower price tag and a large bundle of software aimed at the Australian education system. Differences from the previous model include a numeric keypad, 128 Kbytes RAM and the incorporation of the computer in the keyboard. The price includes the computer, 640 Kbyte 9cm or 13cm drives, the WIMPS environment and software packages.

Peripherals and Extensions

Beehive Terminal Range

Datatel, (03) 690 4000

Price: Not supplied

Three new colour terminals have been released by Beehive, offer-



ing a modular design concept which permits the easy addition of enhanced features as required. The ATL179, 180 and 191 can all be provided with a 2 Kbyte record/play feature, with the ability to store user-selected data-entry sequences such as log-on log-off and various user prompts. The stored data is not lost at power down. Simple ASCII printers may be used for screen dumps and the ATL179 supports colour printers. All three units are designed around a 68000 micro-processor.

software, the system allows users to share information and data simply by plugging into a common power line, and promises networking facilities at about one-tenth the current (current?) cost. I bet the local power suppliers will find a way of charging for using their lines.

LP4000 Low-Cost Multi-Pen Plotter

Barrington Corporation,

(08) 232 1333

Price: Under \$10,000

With features such as: 0.001 inch



Ekko-net Cordless Communication

Cyclops Systems, Marlow, UK

Price: Not supplied

Still in the final experimental stages in Britain, a new system for the transfer of data using existing mains power lines, is nearing fruition. Using a combination of hardware and specially written

resolution, 0.0025 repeatability, 70 cm/sec diagonal speed, paper size adjustable between A4 and A0, standard four-pen to 20-pen capacity, 0.01 per cent accuracy and a 12 Kbyte (optional 512K) buffer, it's no wonder Barrington thinks its new plotter will become the pseudo-standard plotter for CAD/CAM applications.



XENIX SYSTEM V

The Unix for Business & Commerce

NOW AVAILABLE

- XENIX 286: IBM AT & close compatibles, TI PRO, Olivetti M28, Compaq, NCR PC8, Mitsubishi 286, Corona ATP, Sperry PCIT.
- XENIX 86: IBM XT & close compatibles, ITT, Olivetti M24, Sperry, Wyse, Compaq, Ericsson, Leading Edge, Mitsubishi, NCR PC86, Tandy 1200.
- XENIX 68K: Macintosh XL.
- XENIX 11: PDP-11/23, PDP-11/73, Pro 350, Pro 380. (Note: XENIX 11 is not System V).

WHY XENIX?

- | | |
|---|---|
| <ul style="list-style-type: none"> • Full commercial support and training. • Wide and local area networking. • Multi-user, Multi-tasking. • User access controls. • Enhancements: File and record locking; Shared Data, Automatic File System, check and recovery. • Inter-process communications — signals, pipes, print spooler and semaphores. • Xenix is an entire software family. • Xenix lets users tailor their environments. • Electronic mail. | <ul style="list-style-type: none"> • Small, fast kernel — Full Unix System V optimised for speed on micro-computers. • Xenix has been installed on more microprocessor-based computers than all other UNIX based operating systems combined. • Expanded and improved documentation. • Xenix is full UNIX system V, only better. • Xenix has superior multi-tasking design. • Xenix is tuned for the micro-computer environment. |
|---|---|

WHY BLUE SKY?

- | | |
|--|---|
| <ul style="list-style-type: none"> • We have been in business since 1978. • We have been involved with computers since our inception. • First Xenix sold in 1982. • We know Xenix. • Some of our customers include: NCR | <ul style="list-style-type: none"> — Health Commission — Commonwealth Bank — Westpac — Telecom Australia — Philips — TAFE — WICAT — Dept. Science & Technology — University of New South Wales — University of Sydney. |
|--|---|

Australian Distributor

BLUE SKY

BLUE SKY INDUSTRIES PTY. LTD.

2a Blakesley St., Chatswood, N.S.W. 2067.
P.O. Box 131, Lindfield NSW 2070. National: (02) 419-5579.
International: +612 419 5579. Telex: 74994.

MEDIA TRANSFER

Blue Sky Industries designed and developed the extremely versatile system now marketed by NASHUA as the NASHUA DATA CONVERTER. • We provide a disk-to-(& from)-magnetic tape transfer bureau. • MAGTAPE — FLOPPY * UNIX — MSDOS — CP/M — CP/M-86 — PC DOS. 8" — 5.25" — 3.5"

SOFTWARE

NOW AVAILABLE

8 MPC
8 RS232 Ports with high-speed intelligent controller and Xenix Driver.

TIMAKER III integrated office													
MULTIPLAN spreadsheet													
INFORMIX relational database													
LYRIX word processing													
LEVEL 2 COBOL Ansi 74 standard													
FORMS 2 Cobol Development Tool													
ANIMATOR Cobol Symbolic debugger													
C-ISAM													
IBM MAINFRAME COMMUNICATIONS													

NEW NEW NEW NEW

SCO PROFESSIONAL 1-2-3													
SCO UNIPATH SNA													
FOX BASE													
FOX BASE RUN TIME													
XENIX NET													

HARDWARE

- Winchester disk controllers for S-100, IBM PC, stand-alone.
- 8 Port intelligent communications board for S-100, IBM PC, IBM AT.
- Streaming tape back-up for Xenix.
- Statistical Multiplexers 8-16-24 ports with error correction.

Micro-Wand II

TCG Group, (02) 699 8300

Price: Not supplied

Roll up! Roll up! See the world's smallest 64 Kbyte programmable computer! Small enough to put in your shirt pocket, the Micro-Wand is an accurate, lightweight bar-code reader designed for use in the warehouse, inventory yard or anywhere the user needs to collect and process data. It can communicate with any computer and is designed to be compatible with already-installed equipment. It is essentially a data-capturing terminal which can accept data from barcodes or keyboard entry, and communicates with its host via an optical interface, down normal RS232 lines. Features include two-line data display to confirm acquisition of

data, built-in date-time clock, full alphanumeric keyboard, optical scanner and a built-in modem. The size — an amazing 18.5 by 4.5 by 3.3 cm and 196 grams!!!

Opus-2 Terminal

Mitsui Computer, (02) 451 7711

Price: Not supplied

A new addition to Mitsui's ASCII terminal line, the Opus-2 has been awarded the 1986 Industrial Design Excellence Award from the Industrial Designers Society of America. It has a 35 cm, dark-background, high-contrast, flat screen display, in green or amber, with 26 data lines, including two status lines, in either 80- or 132-column format, with a standard two pages of memory expandable to four pages. The



new terminals have 16 programmable function keys, plus an-

other 38 programmable keys, and are Pick and Unix compatible.



CAD Precision is AutoCAD®

...And precision is what design and drafting is all about.

Over 50,000 users around the world recognise the power and flexibility of AutoCAD®. So do hundreds of education institutions, and over 30% of the Fortune 500 Corporations.

And for many thousands of users around the world, Precision also means NCR. With an 8-MHZ 80286 processor, the NCR PC-8 is breaking new ground in high performance computing. As a CAD workstation, the PC-8 is an outstanding performer with it's 640 x 400 resolution and high speed 20/30 Megabyte Winchester Disk.

So when it comes to Computer-Aided Design, CAD Precision is AutoCAD® and NCR.



AUTOCAD®

NUMBER ONE IN AUSTRALIA
AND WORLDWIDE



For further information or demonstration contact your nearest "Authorised AutoCAD® Dealer", by contacting us at . . .
136 BRIDGE RD., RICHMOND
VICTORIA 3121 AUSTRALIA.
PHONE: (03) 429 9888 TELEX: 30625 ME1400



AUSTRALIAN DISTRIBUTOR

NEW PRODUCTS

Parallel Digital I/O Board

Hales and Rogers, (02) 858 5322

Price: Not supplied

Australian-designed and manufactured, this new data-acquisition board is designed to plug into the IBM PC/XT and compatibles, to provide general-purpose parallel input/output. Features include a rear-mounted 64-way socket, direct interface with both CMOS and TTL devices, easy control from programming languages such as Borland's Turbo Pascal and Microsoft's GW BASIC, and is supplied complete with a comprehensive manual and a software read/write utility.▷



Sine Up for Smooth Power

National Industrial Electronics,

(03) 781 4006

Price: Not supplied

Beat those demons called transients, spikes, sags or surges. This new form of line filter is voltage-dependent only, precluding the necessity of matching the amperage rating of the suppressor with the amperage rating of the equipment. As a result, it is capable of protecting all the equipment on a single power source. It is bi-polar, protecting both the positive and negative sides of the sine wave, and offers a response time of two nanoseconds (max) and a clamping level of never more than two volts.

TOSBox Data Interface

Offcom, (02) 438 4199

Price: Not supplied

Incorporating Telecommunications Operating System (TOS) software, the hardware is an MS-DOS-compatible microcomputer designed to meet Telecom's

Mode 1 requirement for direct connection to the Telex network. TOSBox has the throughput capability of three Telex machines, and can store data, switch messages, manage lease lines and keep trying engaged numbers without operator intervention. The unit includes expansion slots which will allow full PC function, and could reduce telex-line costs by 50 per cent.▷

Services

Country-Wise Rural Videotex Service

Visionhire Business Systems,

(02) 959 5600

Price: Normal Videotex charges Visionhire has been appointed preferred national distributor for hardware for the new rural service Country Wise. Accessed through Viatel, it provides continually updated agriculture, weather and market reports, and information on soils, water, environment, crops and vegetation,

livestock and animals, and machinery and plant maintenance. A section called Country Manager provides vital property-management assistance.

PTFE PC Boards

Printronic, (02) 816 5066

Price: Quotes available

For the first time, polytetrafluoroethylene boards can be made in Australia, following the introduction of manufacturing facilities by Printronics. For those of you who didn't know, polytetrafluoroethylene (PTFE) is used in PC board manufacture where specific needs call for very high frequencies to be carried by the board. Previous demand for this style of board had to be filled by imports. Printronics is confident of its ability to handle volume production.

Publink Library Access

Box Hill/Doncaster Regional Library,

(03) 647 9780

Price: Free

Publink allows any micro owner to contact this regional-library database and obtain information from the catalogue system. Users may enquire about the availability of a book or author without visiting the library. Publink can also tell users whether the book required is held by other libraries, and then call and request an inter-library loan. Full marks to Peter Stansfield, Chief Librarian.

Unix and CP/M Courses

Labtam, (03) 819 4200

Price: Not supplied

Labtam has introduced an ongoing series of courses at its Hawthorn branch office. These in-

clude 'Introduction to Unix Systems', 'Unix System Administration', 'Introduction to Uniplex Word Processing', 'Advanced Uniplex WP', 'Advanced Uniplex Package', 'Uniplex Administration', 'Systems Hardware (16- and 32-bit)', 'Unix for Service Engineers' and 'Introduction to CP/M Operating Systems'. Courses run for between one and five days every two calendar months.

Unprotected dBase

Ashton Tate, (02) 959 6411

Price: See below.

For those of you struggling with protected copies of dBase, Ashton Tate has not only released unprotected copies, but is offering upgrades to new versions. A conversion from dBase III Plus to III Plus 1.1 costs \$114; dBase III to III plus 1.1 costs \$432; and dBase II to dBase III plus 1.1 costs \$684. All prices include freight and handling.

Miscellaneous

Audio Cassette

Computer Courses

Barrington Corporation,

(08) 232 1333

Price: Not supplied

There are 27 courses, produced on a 'fliptrack' system which allows branching of the learning curve to suit your needs. Students progress step by step through such subjects as computer operation, word processing, spreadsheets, database management and integrated software. There are also specific machine courses for Apple, IBM, Atari, Commodore, TI and Coleco Adam.

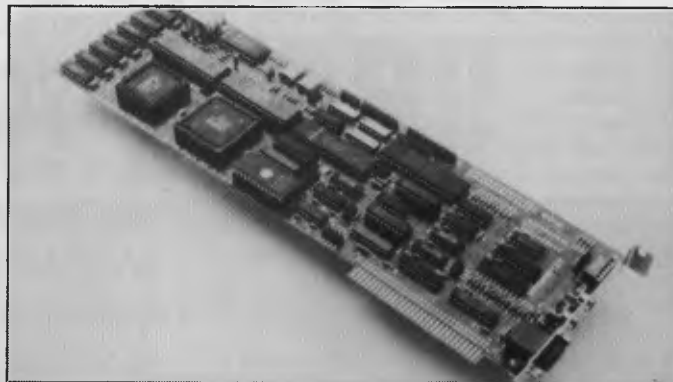
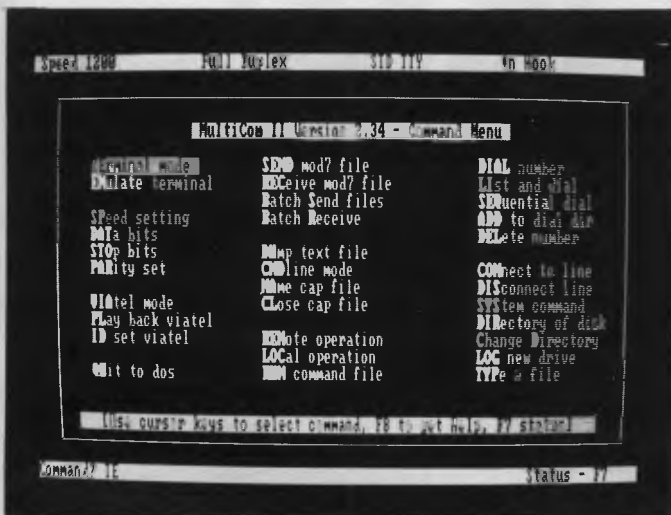
Mediaboard-100,

The Brainy Whiteboard

L&M Electronics, (02) 959 56000

Price: Not supplied

Mediaboard is a multi-screen electronic whiteboard with built-in printer. Whatever is drawn on one or all of its four screens may be printed out in single or multiple copies for handing out to students or conference participants. Up to 99 copies may be reproduced at a time, and a reduction facility allows the entire contents of two, three or four screens to be printed on a single sheet. The Mediaboard is available for sale, or long- or short-term lease.



MultiCom II PC Communications Package

Avtek Electronics, (02) 427 6688
Price: \$149.50

Written by well-known Aussie software writer Barry Hall, Multi-

com II combines a conventional ASCII comms program and a Videotex package with a terminal emulator and a full screen-mapped 'remote' facility. The software supports emulation of

more than 30 different terminals and can run programs remotely, even those which (like Lotus) access the screen directly. Multi-com II also comes with autodialling plus automatic redialling (now you can get on to those busy bulletin boards). Amongst the useful features is the ability to dial and logon to Viatel and the like with a single keystroke.

EG-8 Graphics Expansion Card

Emulex Corp, (02) 858 4833
Price: ????

Billed as an eight function solution for users of IBM's PC, XT and AT Personal computers, the EG-8 emulates the IBM Enhanced Graphics Adapter (EGA) as well as the Color Graphics Adapter (CGA) and the Monochrome Display Adapter (MDA), with (they tell us) 100% software compatibility. The other five (to make eight solutions): a serial port, a bi-directional parallel port, a calendar/clock, lightpen interface, and RAM disk and print spooling software — all added through the one long slot. The EG-8 is provided with 256 Kbyte of display memory and supports the IBM 128-character set plus 384 user-definables in RAM.

Dac Easy Base

Mace Software,
(07) 870 3600
Price: \$145.

From the Texan company that brought us DAC EASY and virtually revolutionised accounting software, we now have a powerful relational database, that can handle an unlimited number of records with up to 60 records per field and access three fields at any one time. For anyone looking for an 'accounting database', it offers a number of interesting features such as the ability to handle data arithmetic and the use of formula fields for calculations within files — and data entry can be through user-customised forms. There is also the facility to write memos outside the database itself. A handy feature is the ability to read and convert dBase II files as well as run dBase programs.

BACK 4 UP

ESSENTIAL DATA DUPLICATOR

Back up your copy-protected disks with **ESSENTIAL Data Duplicator 4 PLUS** ■

EDD 4 PLUS is new technology, not just 'another' copy program. The **EDD 4 PLUS** program uses a specially designed hardware card which works with your disk drives to back up disks by accurately copying the bits of data from each track. Don't be fooled...

no other copy-program/system for Apples can do this! ■ In addition to backing up disks, **EDD 4 PLUS** includes several useful utilities such as examining disk drives, certifying disks, displaying drive speed rpm's, plus more!

■ **EDD 4 PLUS** runs on Apple II, II Plus (including most compatibles), and IIe, and is priced at \$190.00 (duodisk/ unidisk 5.25 owners must add \$32.00 for a special cable adapter). ■ A standard

EDD 4 version which doesn't include any hardware is available, and can be used on Apple IIc and III (using emulations mode) and is priced at \$125.00.

■ Bankcard and Master card accepted by phone.
Add \$3.00 to all orders for postage and handling.

All orders must be prepaid.

UTILICO SOFTWARE

83 HALL ST., BONDI BEACH,
NSW 2026 PHONE (02) 30 2105

WARNING: EDD is sold for making archival copies only

HI, MICROBEE USERS, maniacs and sober business women and men! Since I've been foolish enough to accept the job of writing this column, I had better tell you what hardware I have access to — so you have some idea what I can review and what I can't (yet) do.

My main work machine started its life as a standard Microbee 128 Kbyte system running all the usual CP/M and Microbee software. However it recently had a memory transplant by a very competent surgeon and is now a 512 Kbyte machine. This has made it quite wonderful — but more about that later. It still runs all the standard software.

I graduated some two years ago from a ROM-based non-disk machine to a 128 Kbyte twin-disk (13 cm) machine. This is my favourite workhorse. Please note, I don't have easy access to a machine to run the smaller 9cm disks. I have a modem (300 and 1200/75 baud).

I have not yet upgraded to the new Premium-version Bee, with its cursor keys and superior graphics. It is possible that I will upgrade to it later — it probably can still be done, despite all the extra memory in my machine.

I had resisted pressure to go 16-bit for ages, as I find the 128 Kbyte Microbee an excellent, friendly, fast and versatile machine, but I recently had occasion to review some 16-bit software ... So I now also have the Microbee Mitac machine with 512 Kbytes of memory, total IBM compatibility, two disk drives and a mouse! It is wonderfully silent compared to the fan-cooled IBM types around.

The Return of Dr Kildare

Now for the surgery! My machine has had its memory bumped up to half a megabyte. The surgeon was Peter Broughton of Broughton Engineering, an active member of the Melbourne Microbee Users' Group, who upgrades the memories of Microbees and Macintoshes in his spare time. He can do a couple of machines a week (Quickdraw McScalpel); and I've heard the Adelaide Microbee Users' Group has someone who can do even more machines a week (sheer recklessness — has someone told the union?).

Peter does an extremely good job, and supplies a very useful packet of accompanying software — all for \$185.

The principal consequence of the upgrade is that my memory drive, or RAM disk, is now 412 Kbytes. This allows me to load Wordstar and all my frequently used programs permanently into the memory drive, and use both of the physical drives, a: and b:, for document and back-up disks — so my Bee operates with enormous speed.

The principal consequence of the upgrade is that my memory drive, or RAM disk, is now 412 Kbytes. This allows me to load Wordstar and all my frequently used programs permanently into the memory drive, and use both of the physical drives, a: and b:, for document and back-up disks — so my Bee operates with enormous speed.

The Shell and all other utilities operate as normal. Peter's adaptation of the operating system is only visible at boot, when a message comes up on the screen before the Shell appears, telling you that it is now a 512 Kbyte system.

The mathematicians out there will be wondering where the missing 'page' of memory is; 412 Kbytes plus 64 Kbytes operating space makes up only 476 Kbytes. Peter uses the remaining memory to store the operating system. The Shell is automatically stored there on cold booting. If you set your machine with INIT.COM to start on CCP and then load the Shell, both will go into hidden storage. Then, once you've booted the machine, there's no need to keep either CCP.SYS or SHELL.SYS present in a drive. Peter is writing all sorts of software for this hidden cupboard, including a graphics driver and function keys.

If a disk with the standard Shell and operating system is loaded, the machine instantly becomes a standard 128 Kbyte Microbee with an empty 62 Kbyte memory drive ready for use. Needless to say, I don't load an old disk when I have 400 Kbytes of valuable software sitting in the memory drive!

Peter supplies software with the machine, which allows you to copy the operating system away as a usable file on disk, and to load different copies of the system — a great help to anyone like him who likes changing the system.

His software can also set up the machine to run disk drives of varying types and sizes, including 800 Kbyte 9 cm drives. His programs are all easy-to-operate menu-driven utilities. You can also reverse drive names so the M: drive becomes A: — a great help when your programs expect to find their files on the A: drive. Peter also supplies programs to allow you to format either the whole disk or designated tracks on a disk — for both 40- and 80-track drives.

And Peter can upgrade CIAB machines to 256 Kbyte for \$120 (CIABs cannot get up to 512 Kbytes).

He is contactable either on (03) 347 8114 (ah), or via the User Group Bulletin Board on (03) 882 1571.

I have had my Microbee on constantly, sometimes for a week or more (with only the screen switched off when it's not in use) — and it does not overheat, despite the extra heap of memory chips inside it. Peter's operating system seems to be completely stable and bugless. Wordstar and the other programs are always in place — and are not disturbed even when I reset the machine.

Of course the speed is fantastic. I just had a 52 Kbyte document load from disk to the memory drive in nine seconds. Wordstar starts off practically instantly.

I wish I could get the Microbee 16-bit machine to perform as efficiently. You can configure it to have a somewhat slower RAM drive, but, under MS-DOS, every time you reset the machine the RAM drive is wiped out and remade. The Mitac can, however, run more deluxe-sized programs than the 8-bit Microbee.

I'll be back next month. Till then, happy computing! □

FOR TOUCH-CONTROL, TOUCH A STAR!!



In the Star range there's a printer that's tailor-made for any application.

And each and every one of them features touch-control. You can forget all that fumbling with switches to change modes and functions. With a Star, you simply touch a pad on the control panel to select the typeface and print pitch, to choose draft or Near Letter Quality printing, you can even set margins and align forms.

Of course, touch-control isn't the only feature of Star Printers. They're packed with all the features that you require for top quality printing. Check out the Star range from your local dealer. Telephone Star Micronics today for the location of that dealer.

star
micronics

DISTRIBUTED BY:

Star Micronics Pty Ltd.
Unit 7, 25 George St, Homebush, NSW 2140, Australia.
Phone: 736-1144. Telex: AA73872. Facsimile: 736-1032.
MELBOURNE: Phone: (03) 819-1050.

dBase Mac

They held a party recently to launch the new Macintosh version of dBase ... well, not actually launch it, but to announce that it would be launched in the near future. Unless disaster has struck down the Ashton-Tate Mac developers once again, they've probably got it on sale by the time you read this.

Having a party to launch a dBase in 1986 is a bit like going to a full-dress ball to celebrate the re-release of *Gone with the Wind*. The first of the dBase series of database management programs went on the market back in 1981, and it has been the top money spinner in this niche ever since.

Wayne Ratliffe, the program's author, started out with Version II, in case you are wondering why you never heard of dBase I, and now we are dealing with Version III and/or III+ (on MS-DOS machines anyway).

In dBeginning

Originally dBase II was written for CP/M, and a large part of the sales would have been to the business CP/M market, before the advent of the IBM PC. And being on CP/M it was copyable; especially for the Apple II with a Z-80 softcard, so dBase is probably the most pirated program of all time.

This is why the release of dBase for the Macintosh is actually a significant step ahead for Apple, even though it is a program with silver hair and a hearing aid. There are thousands of hackers and professional programmers out there who cut their teeth on this program/language; it is the BASIC of the database management world.

The traditional strength of dBase has always been with its programming language, which makes it a rather paradoxical choice for a computer which prides itself on ease of use, through icons, the mouse and menus. You can use the MS-DOS and CP/M versions of dBase without programming, but only as a simple list manager (it works quite well). For any serious work you need to master a quite complex language, with a large number of syntax peculiarities.

Hopefully, the use of icons and menus on the Mac will make programming a breeze — but a translation like this from a complicated conventional language/program to an idiot-proof Macintosh package is not easy to make. When many other

The traditional strength of dBase has always been with its programming language, which makes it a rather paradoxical choice for a computer which prides itself on ease of use, through icons, the mouse and menus.

programs have been translated (as distinct from re-written), they always look 'patched', and usually make use of only about half the Mac ROM routines open to them.

dFining dCompetition

dBase's opposition on the Mac will not come from Microsoft's File. File is a very clever and substantial program, but not in the dBase class. I don't count Jazz as a competitor either, since it is really only useful as a list manager; and despite its recent improvements, Helix is not in the same race.

Taking the charge head-on, however, will be Blyth Software's Omnis 3, which I think is one of the best database management packages ever written. But to confuse the issue, I would say the same about dBase.

The difference is that Omnis 3 was written originally for the Macintosh, while dBase wasn't. Apple and Ashton-Tate assure us that "dBase has been completely re-written for the Mac — it's not just a translation", but I'll believe that when I see it.

Omnis 3 has another advantage that dBase will find hard to match: Blyth Software also produces Omnis 2, which is a super-list-manager with some database management functions, and as such is admirably suited for the low end of the database market.

Probably more than with any other program sector, users of database programs find they need to progress in complexity as their businesses find new uses for their computers. Companies start off wanting

only simple computerised mailing lists, but once they have succeeded with this, they become aware of other possibilities.

Gradually they move into stock records, then detailed inventory and accounting, and before you know what has happened they want the whole she-bang automated so all business records can be updated overnight while the staff sleeps. This puts a lot of pressure on the database management program authors. It is like having a word processing program which is designed for slow learners at one end of the spectrum, but needs to do professional page-layout and typesetting at the other.

In the days before the Macintosh, when computer users didn't eat quiche, dBase II was the program of choice, simply because it allowed this progression. You started off by just learning one or two commands from the manual, and you used the program to keep phone or mailing lists.

Later, you either invested six months of your life trying to learn the language and decipher Wayne Ratliffe's horrific manual, or you paid someone large sums of money to progressively construct a series of automated processing command programs.

dCeptive on dFace of It

Despite the programming complexity, dBase II presented a simple-to-use facade to the outside world. The input and output screens were easy to read and easy to use. And you could throw the gear into automatic as you switched off the lights at night, and by morning the stock and shipping records would be updated.

So dBase Mac could be either a dramatic step forward for the Macintosh, or a non-event. I know I'll use it because I guess there are a lot of other dBase programmers out there to give the program a push. Whether it will roll the Omnis 2 and 3 series, however, is anybody's guess. We'll have to wait and see. □

Interested in dBase?

Subscribers to YC receive *dLetter*, the independent monthly newsletter for dBase II and III users, at no extra cost. *dLetter* draws on the talents of three of the most experienced dBase users in Australia to give a wealth of information, help, hints, tips and techniques to help solve data handling problems. And it's the source of feedback from the people who count — the everyday users of dBase. *dLetter* — every month with *Your Computer* subscription.

AS I WORK with my computer from day to day, I come across all sorts of little (but still time-consuming tasks) which could be made so simple if only the right utilities were to hand.

The greatest problem most PC users have is taking data from one program and massaging it into a form which is usable by another program. With the widespread use of Lotus 1-2-3, methods of getting all forms of data into this popular program are essential.

Some software gives no options to the user when output is desired. With these programs, either the data is saved to disk in some proprietary format, or it is printed via the parallel port. None of the standard file interchange formats are available, and the program may not be able to save the output to disk in the identical format as it would be printed.

Virtual Print

VPRINT.COM (1536 bytes, 9D12D84) is a simple little co-resident program which can divert output from another program (aimed at the first parallel port) and save it in a file. It's been around for years, and is executed at the DOS prompt with the command

VPRINT filename.

This causes all output destined for the parallel port to be saved in a file named 'filename'. It is possible to toggle off the diversion with the command VPRINT /n. This toggle is case sensitive, and only a lower case 'n' will work!

I have heard VPRINT is not happy with some versions of DOS 3.x, and, in any case, the use of Shift-PrtScr can hang the system. Try the combination of your machine, your application and VPRINT on a non-critical application before staking your Magnum Opus on it. All software, commercial or public domain, should always be fully tested by every end user, on their own equipment, with their own files, before using it for a critical application.

123PREP

OK, now you have a disk file. What if this file is of a database, with one line per record and all fields in each record on the same line, with no delimiters like commas or quotes? The XFERLIST files on many Bulletin Boards are just like this. How can

*Public domain software
(along with that grey area
of user-supported software)
is a co-operative venture
with many talented people
writing simple and exotic
programs, first for
themselves, then donating
them free of charge to the
pool we all share.*

they be loaded into Lotus? How can they be used as the database of names and addresses needed when Wordstar and Word want to merge a form letter with a database to do a mass mailing?

Normally, Lotus can import such files with the File Import Text command — but each line is read in as a continuous line of text. If the only data on a line is numeric with spaces between the numbers, the File Import Numbers command can be used, and the record is separated between the numbers. Mixed text and numbers, or multiple text fields on the same line of the original file, are more of a problem.

123PREP.EXE (9674 bytes, 5-02-84) to the rescue. It reads in each line of the source file, separates that line into fields with lengths selected by the user, who also decides which fields are to be treated as numeric and which as text. The text fields are surrounded by quotes, while the numeric fields are left untouched, though a space is left between each field and the next, whether numeric or text.

Now the Lotus File Import Numbers command will import the file, and the fields will be separated into different columns within the worksheet. Other software that you propose to use may not accept simple quotes around a field as an adequate delimiter. Some word processors also require a comma when merging a form letter with a database. In this case you may have to use that word processor

first on the database file created by 123PREP, to add commas between the last quote of a field and the first quote of the next field.

The Public Domain

Public domain software (along with that grey area of user-supported software) is a co-operative venture with many talented people writing simple and exotic programs, first for themselves, then donating them free of charge to the pool we all share. User groups then distribute them around the world at a nominal charge, based on the price of disk, postage and copying. This should cost no more than around \$10 to \$12 dollars per disk, and any commercial operator charging more is really exploiting us all and should be avoided.

If you have written something — let the public domain librarian of your user group have a copy, so it can be added to the worldwide collection. I would also like to hear of public domain items that are particularly good (or bad, so we can all be warned), and would love to get working copies of the good ones!

Merry X

I'd like to wish all *Your Computer* readers a Happy New Year. Thanks for all the letters you sent in 1986, and for the comments in them — keep the feedback coming. □



You get more out of a Thomson Monitor.



Thomson's superior standards show through – clearly. Sharper characters. More brilliant graphics. Eye fatigue reduced. Headaches eliminated. You get much more from your computer hours.

Ten economical green, amber and colour models for all popular PCs.

For a dealer near you contact –

THOMSON 

Thomson. Simply, the world's best monitors.
Phone (02) 290 1122 for your nearest outlet.



president

DESKTOP SCANNING & PUBLISHING SYSTEM

100 George St., Hornsby NSW. 2077 - Phone: (02) 476 2700 - FAX: 2-4764582

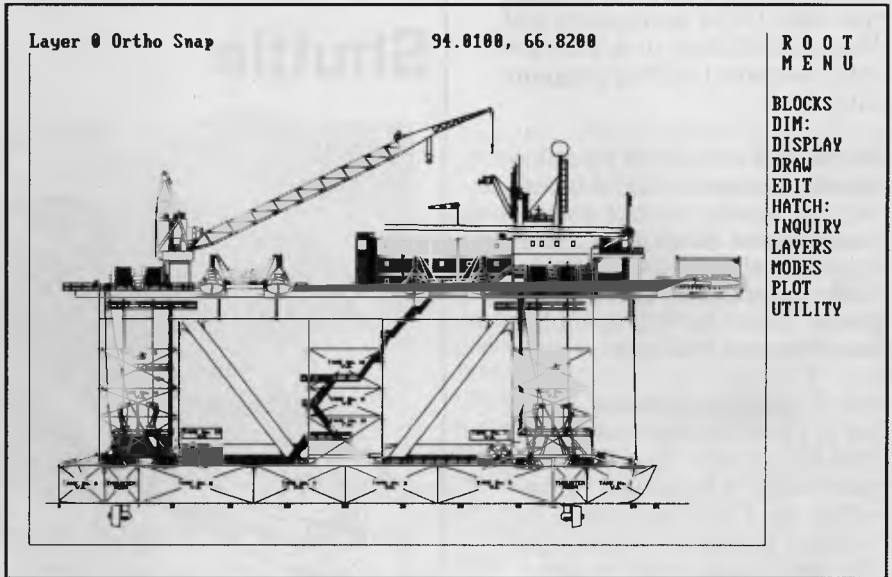
MegaFreeze

The MegaFreeze software package allows you to take a snapshot of your monitor screen in any PC application. The screen image is placed in the MegaBuffer (1.3 megabyte pixel buffer) with the same resolution as your monitor's display mode. Then with the MegaScan software, you can enhance or add text to your MegaFreeze image before including the image in a larger document.

MegaFreeze is ideal for documenting software programs containing menus or option lists. The screens in your software program can be captured and used as illustrations as you proceed to document the program's features.

MegaFreeze is also great for illustrating sequences in installation or test procedures. Depending on your screen resolution, up to 76 freezes can sequentially be created and placed in the MegaBuffer.

MegaFreeze images can also be used for introducing, highlighting, or describing the features of a new software product in your newsletter.



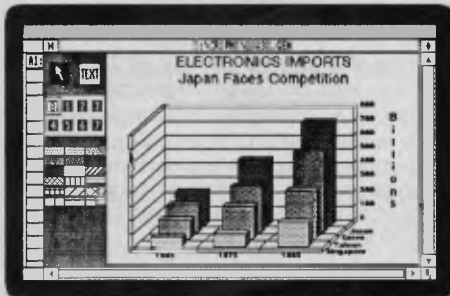
AutoCAD Screen Captured Using MegaFreeze and Wyse WY-700 Monitor

MegaFreeze Features

- * Memory resident software program compatible with other memory resident programs. Activated by the Shift-PrtSc (Print Screen) keys.
- * Installable on any IBM PC-XT, PC-AT, or compatible that has a MegaBuffer card and a MegaScan software program already installed.
- * Supports the Color Graphics Adaptor (CGA) display monitor in all modes except 40 column by 25 line text mode.
- * Supports the Wyse WY-700 monitor in 1280 x 400 mode and in 1280 x 800 mode.
- * Display modes, double size freeze option, and inverse video option selectable from the command line.
- * Up to 76 screen freezes can be placed in the MegaBuffer at one time depending on the MegaFreeze freeze size option selected and the resolution of the monitor you are using.
- * Flow files are provided to combine freezes with an outer black frame to create a "screen" look. Flow files can also be used to isolate a freeze so it can be moved, edited, or saved.



Lotus, 1-2-3 Screen



GEM Graph Screen

Typical Applications

- * Technical manuals
- * Software manuals
- * Advertisements
- * Sales brochures
- * Newsletters
- * Manufacturing Documentation
- * Overhead transparencies
- * Data Sheets
- * Reports

IBM is a registered trademark of International Business Machines Corp. Wyse and WY-700 are trademarks of Wyse Technology. Lotus and 1-2-3 are trademarks of Lotus Development Corporation. AutoCAD is a trademark of Autodesk. GEM Graph is a trademark of Digital Research, Inc. MegaFreeze, MegaScan, and MegaBuffer are trademarks of Advanced Vision Research, Inc.

MegaGEM

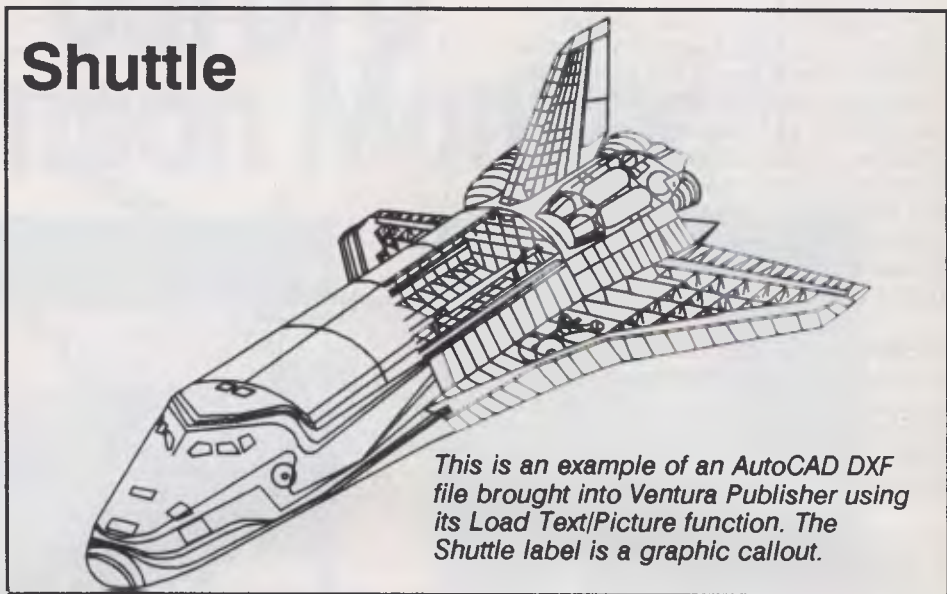
MegaGEM is a software package that links GEM applications and Ventura Publisher to AVR's powerful image/text editing program: MegaScan.

MegaGEM consists of three individual programs: a GEM accessory for scanner control and image format translation; a printer driver for 300 dpi output from GEM applications; and a second printer driver for 300 dpi output from Ventura Publisher.

The MegaGEM software allows the AVR-300 image scanner to scan images into the 1.3 megabyte pixel buffer (MegaBuffer) from within any GEM application or Ventura Publisher. MegaGEM can also transfer pixel images between the MegaBuffer and GEM image files.

MegaGEM Features

- * Operates the AVR-300 scanner from within GEM applications or Ventura Publisher.
- * Prints from GEM applications and Ventura Publisher at 300 dots per inch on the AVR Laser Printer.
- * Reads GEM images into the MegaBuffer where they can be edited and incorporated into larger documents.
- * Transfers GEM application and Ventura Publisher formatted output into the MegaBuffer where they can be edited with the MegaScan software.
- * Converts scanned or other images in the MegaBuffer into GEM image format.

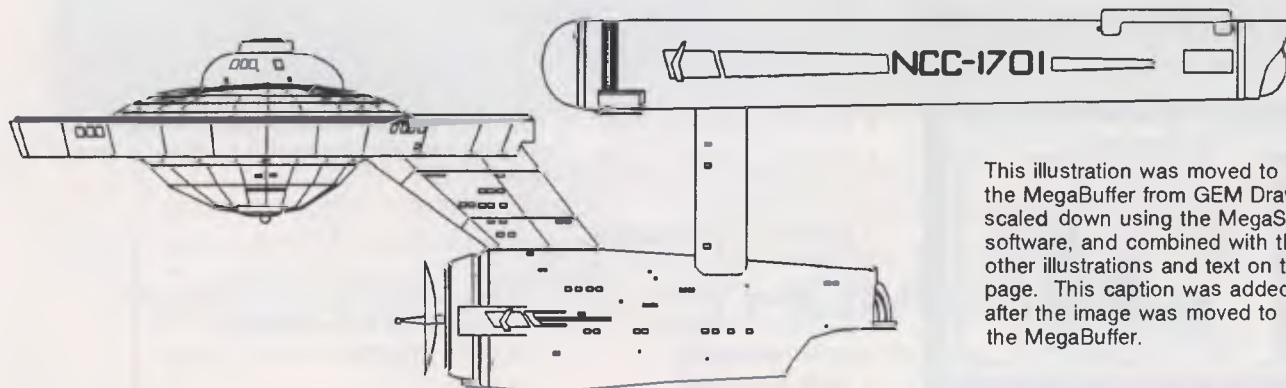


This is an example of an AutoCAD DXF file brought into Ventura Publisher using its Load Text/Picture function. The Shuttle label is a graphic callout.

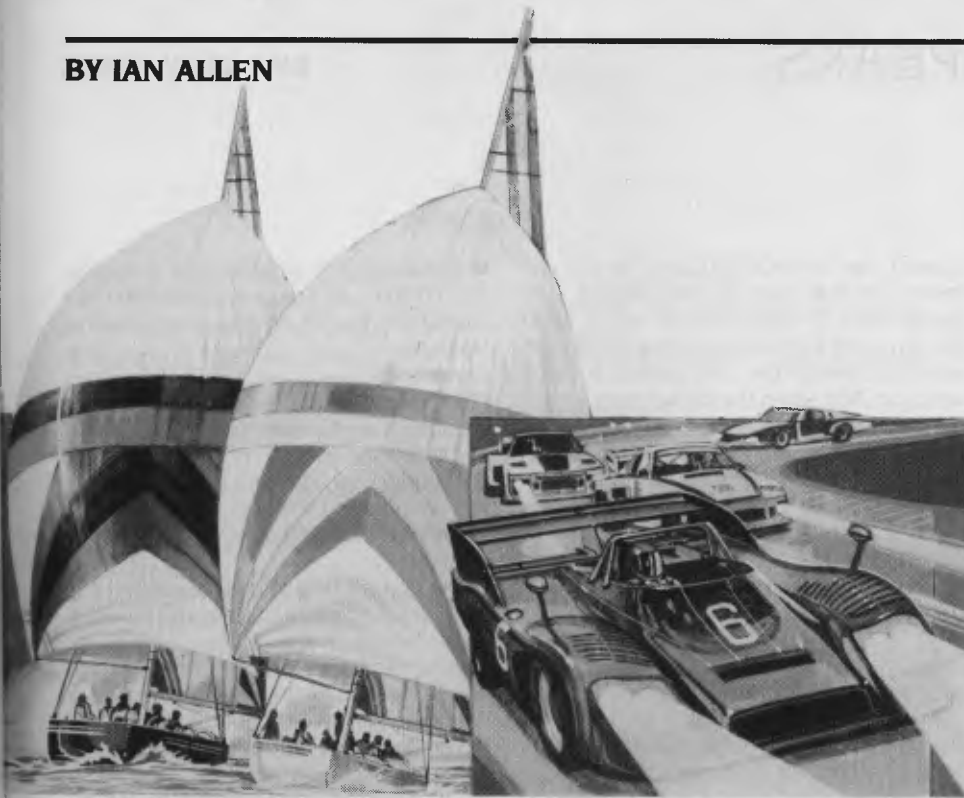
This illustration with text was moved to the MegaBuffer from Ventura Publisher to create this data sheet.



This image was scanned using MegaGEM from within GEM Paint.



This illustration was moved to the MegaBuffer from GEM Draw, scaled down using the MegaScan software, and combined with the other illustrations and text on this page. This caption was added after the image was moved to the MegaBuffer.



I REMEMBER the night we won the America's Cup. I remember it well because I was having one of my midnight-to-dawn programming sessions and just happened to have the TV on as well. I also remember the sportscasters preparing to crucify John Bertrand for losing. The poor fellow made a tactical error on the first leg — one that looked as though it would cost him the race — and boy was he going to pay. But he was lucky. He found a wind shift and became a national hero instead. Funny, isn't it, how sportsmanship only counts if you're a winner.

This year it's all on again, and you can do more than watch it on TV — you can also play the game. Commodore (appropriately) has included an America's Cup game in its C64-C Family Packs. It's a cassette game, so it's a little slow in loading, but if you are into sailing you will probably find it quite interesting. 'Arnie's America's Cup Challenge' uses a combination of five different screens and a joystick to place you in command. The joystick is used for everything from steering to sail selection. It even functions as a winch! (You hold the fire button and rotate the joystick.) You can play with one or two players and you can set various degrees of difficulty (which basically determine the extent and frequency of the wind shifts).

The game comes with a brief set of instructions, which includes a glossary of sailing terms and a description of how the game is played. The instructions are adequate for someone familiar with the C64, but there is very little information about how to load the game. Datasets can be a bit finicky, and sometimes you may have

If you happen to have any SSG games (Reach for the Stars, Carriers at War, Europe Ablaze or Battlefront), you may be interested in the company's house magazine 'Run5'. It's full of hints and tips, and often has articles giving insight into how to make the most of the different scenarios.

to try a couple of times before you get a successful load. Experienced users know this, but the sort of person who buys a Family Pack is likely to be a complete computer novice — Commodore could have provided a little more help.

The other two games in the Family Pack also follow a sporting theme. One is a cartridge game called Formula le Mans; this is a racing-car game, but it's not a new one. It's been around since the 64 was first released. Its graphics and style are not up to those of the latest in the genre, but it's still quite a playable diversion. I think it's commendable that CBM has included at

least one cartridge game. Cartridges are idiot-proof, and it means new owners will easily be able to get their computer to do something.

The third game is the cassette-based 'Arnie Armchair's Cricket Game'. This is a game for two players and requires some eye/hand co-ordination. The fielding player can position his or her team and select what type of bowling attack. Once the bowler begins his run, the fielding player uses the joystick to activate one of the fieldsmen who will try to catch or return the ball. Batting is done by the other player, again with a joystick. You have a choice of about eight different strokes, ranging from a glance to a square cut. You make this selection as the bowler in motion, so you must be fast. Pressing the fire button causes your player to make the stroke. This is where the eye/hand co-ordination comes in: too soon or too late and you'll miss the ball.

The game has provision for different types of matches. You can play a limited game, a one-day game or a test match. You can also give your team members individual names. It may not be the real thing, but if you can get the hang of it you needn't worry about breaking anybody's windows.

RUN5 Magazine

If you happen to have any SSG games (Reach for the Stars, Carriers at War, Europe Ablaze or Battlefront), you may be interested in the company's house magazine *Run5*. It's full of hints and tips, and often has articles giving insight into how to make the most of the different scenarios. The Strategic Studies Group regularly publishes new scenarios, which you can create by using the game design routines, but if you can't be bothered typing in the details you can also get a disk subscription which has all the scenario info already entered. *Run5* is available from most of the stores that sell SSG products, or you can subscribe direct (\$15 for four issues, or \$65 for four issues and four disks). The address is The Strategic Studies Group, PO Box 261, Drummoyne 2047-

And for more on the new Commodore, refer to my review earlier in this issue — GEOS! It's a new C-64! □

THE PAMS REGISTRY is working, though many system operators are slow getting their information in — the registry system will only work if *you* support it, so get organized now!

Christensen File Transfer Protocol

Christensen (also called Modem/Xmodem) file transfer protocol has been around for quite a few years now and, like many things computerish, is veiled in mystery and misunderstood by many. So this month I am going to give you all the details you ever wanted to know about the Christensen file transfer protocol.

Data is sent in 128 byte blocks within sequentially numbered packets, which include a packet header, the data, and a checksum of the packet (excluding the checksum itself). As the receiving computer stores incoming data in memory, it performs its own checksum of the packet and then compares the computed checksum with that in the packet. A successful comparison means all the information was sent correctly, and the receiving computer acknowledges this by sending an ACK (ASCII for Acknowledge Hex 06) to the sending computer. If the comparison fails, the receiving computer tells the sender to resend the packet, by sending a NAK (ASCII for Negative Acknowledge Hex 15).

When a file transfer is initiated, there is potential for a problem to occur (and some terminal programs really mess this up): the sending computer could wait for the receiving computer to do something, and vice versa, which would obviously result in everyone going nowhere fast! What should happen is that the receiving computer sends a NAK to the sender to initiate the transfer, and if that doesn't happen the sending computer should transmit the first block after 10 seconds.

Now the sending computer will transmit the first block, which consists of a SOH (ASCII for Start of Heading, hex 01), the block number, the two's complement of the block number, and 128 bytes of data followed by the checksum — 132 bytes all up (see Figure 1).

This process continues with the next packet of information. What happens when (yes when) the receiving computer sends a NAK? Simple, the sender transmits it again, just like when someone says "beg your pardon" in conversation (see Figure 2). In the same way that information coming from the sender can be garbled, sometimes the sending computer

doesn't 'see' an ACK/NAK sent by the receiver. In this case, it will resend the packet after 10 seconds ("oh no", I hear you say), but since the receiving computer knows it already has that packet, it just sends an ACK when the packet ends — all fixed!

How does the receiver know what packet it's getting? The block number is incremented for each packet sent, and the receiver also adds the SOH, the block number and the two's complement of the block number, the result of which calculation should be zero (for example 01 [SOH] + 01 + FE is 00) — so there's a double-check of the block number, in addition to the check on the whole packet.

In normal completion of a file transfer, the sending computer transmits an EOT (ASCII for End of Transmission Hex 04), and the receiving computer then sends a confirmatory ACK (see Fig 3). If the EOT is lost, the receiver will continue to wait for the next block, sending NAKs every 10 seconds, and will eventually time out (after 10 NAKs).

One thing which is often overlooked is that the receiving computer must be capable of receiving the entire packet at the full speed of the communication link, which can cause problems at high speeds.

PAMS List Updates

Special Thanks to Tony Nicholson for a copy of the Newcastle Microcomputer Club RCPM users guide, congratulations on a very professional manual!

ACT

Corrections:

- The PC Exchange RIBM now caters for all baud rates.

New South Wales

New Systems:

- Bee-Hive BBS: phone (02) 520 7237; Friday, Saturday, Sunday, Monday 0900 — 1800; sysop, Paul Pinches.
- Books BBS: phone (02) 525 5781 RING BACK; 24 hours; supports all baud rates; Reg/LVA access; sysop, Chris Ruwoldt.
- Metebeelus RBBS: phone (02) 349 2366; Monday to Friday, 1800-0900; Thursday 2200-0900; Saturday 1500 until Monday 0900; Reg/VA access; sysops, Tony Kemper and William Nitske.
- Sorcerer Users Group RIBM: phone (02) 626 8020; 24 hours; Mem/VA access; sysop, John Cepak.
- Tachyonics Fido-Net: phone (02) 438 2682; 24 hours; Reg/VA access; sysop, Richard Lenz.

- The Bulletin Board Fido-Net: phone (02) 80 3681; 24 hours; (02) 690 9400 V22 2000-0700; Reg/VA access; sysop Brian Houlahan.

Corrections:

- Arco-Tel is now Mem/LVA, and caters for almost all computer users.
 - CUA C-64 is now the Comet C-64.
 - Club-80 now supports V23.
 - Commboard C-64 BBS should be The Commodore 64 BBS, and V23 will now be available.
 - The Contact BBS also supports Bell 212.
 - Freecom Number is not correct in Pam-slist releases prior to 8609a.
 - Newcastle Microcomputer Club RCPM hours are 1700-0800 on weekdays, 24 hours weekends and public holidays.
 - The Computer Connection is on-line 24 hours on weekends.
 - The sysop of the Realtors Fido-Net is Gary Stern.
- Off-line:**
- Australian Connection — status unknown
 - Freecom C64 BBS — status unknown

Victoria

New Systems:

- AHUBBS: phone (03) 762 1582; 24 hours; sysop, John Forbes.
 - Castle Mania: phone (03) 379 5123; 0700-0000; sysop, Mike Purdy.
 - Motel International: phone (03) 509 9611; 24 hours; all baud rates; sysop, Kim Gratton.
 - Omega BBS: phone (052) 22 1670; hours 1900-0200; sysop, Mark Gregson.
 - Pacific Island: phone (03) 890 2174; 24 hours; sysop, Craig Bowen.
 - Profit IBBS: phone (03) 529 8749; 24 hours; V21/22/23/22bis; sysop, Andrew Hooper.
 - Public Resource #1: phone (03) 878 2918; 24 hours; Bell 103 and V22 only; sysop, D. Harvey.
 - The Magic Pudding: phone (03) 428 2178; 1900-0700; sysop, Rupert Russell.
 - Videotex 4000: phone (03) 329 2936; V23 Viatel.
- Corrections:**
- AM-NET is a multi-user remote Turbo-DOS system, with member access and limited visitor access.
 - Abacus RCPM is V21/23 (with auto-change to 75/1200 for uploading) Reg/VA. Hours are 0800-1200, 1600-2300, seven days. The sysop is Maurice Copeland.
 - Down Under Software is now Fido-Net: phone (03) 429 5819; V21/22/23/22bis.

- Micom BBS now has two telephone lines on the existing number.
 - Public Resource is now system #2.
 - Sysops of The Real Connection are Carla Miller and Andrew Moore.
 - Thunder-Net-Amiga also supports V21/22/23.
- Off-line:
- Millionaire BBS — status unknown.

South Australia

Corrections:

- The Electronic Oracle RBBS supports V21/22/23 and V22bis on a rotary-dial number — (08) 2606222
- Off-line:
- Red Centre RCPM — status unknown.

Western Australia

New Systems:

- The Gathering BBS: phone (09) 272 4711; 24 hours; V21/22/23; sysop, Ken

Peters. Corrections:

- Nemo BBS now supports V21/22/23.
- Off-line:
- Mindstorm BBS — status unknown.

Queensland

A complete listing for Queensland is included due to the large number of changes to the systems in the sunshine state.

- Acea Commodore BBS: phone (07) 341 0285; 24 hours EST.
- Ampak PBBS/RCPM: phone (07) 263 7070; 24 hours; V21/22/23/22bis; Mem-/Public access; sysop, Brian Wendt and John Bews.
- Brisbane Experimental RCP/M (BEX): phone (07) 395 1809; 24 hours; sysop: Rik Dalley.
- Brisbane Commodore User Group BBS: phone (07) 808 2125; 24 hours; sysop, Ray King.

```

Receiving Computer
-----/NAK/-----/ACK/-----
      15H              06H

Sending Computer
-----/SOH/BLK#/BLK2/DATA/CSUM/----/SOH/BLK#/BLK2/DATA/.....
      01H 01H FEH .... ddH      01H 02H FDH ....

```

Figure 1. Packet organisation and block numbering.

```

Receiving Computer
-----/ACK/-----/NAK/-----
      06H              15H

Sending Computer
CSUM/----/SOH/BLK#/BLK2/DATA/CSUM/----/SOH/BLK#/BLK2/DATA/...
      01H 03H FCH .... ddH      01H 03H FCH ....

```

Figure 2. Packet failing checksum, data retransmitted

```

Receiving Computer
-----/ACK/----/ACK/ Back to command prompt
      06H      06H

Sending Computer
CSUM/----/EOT/----/ Back to command prompt
      04H

```

Figure 3. End-of-file sequence

- Been burgled?
- Engine cross-firing?
- Light bulbs burning out?
- Can't share your printer?
- Haven't got a light meter?
- Aren't sure of your CRO's calibration?

Can't pick up stereo on your AM radio?

Don't know where those vibrations are coming from?

You need Electronics Today's



great new selection of Projects!

**Simple
for the Beginner!**

**Great
for the Hobbyist!**

At your Newsagent now!

Or send \$3.95 plus \$1.50 post and packing to
The Federal Publishing Co, PO Box 227,
Waterloo 2017 NSW.

- Brisbane Microbee User Group BBS: phone (07) 38 4833; 24 hours EST; public access; sysop, Graham Scott.
- Cairns & District IBBS: phone (070) 51 1360; 24 hours; sysop, Neil Barker.
- COCO Link: phone (075) 32 6370; 24 hours EST.
- Commodore Express: phone (07) 393 5352; sysop, Craig Upton.
- Communications Interchange: phone (07) 200 7664; sysop, Geoff Leff.
- Competron IBBS: phone (07) 52 9498; 24 hours; sysop, David Johnson.
- Computer Orchard: phone (07) 350 1300; sysop, Scott Pierce.
- Educational RCPM: phone (07) 266 3369; sysop, Andrew Waddell.
- Electric Dreams BBS: phone (07) 399 1322; sysop, Joe Altoff.
- Futec C-64: phone (07) 283 2034; sysop, Paul Salanitri.
- Hi-Tech CBBS: phone (07) 38 6872; 24 hours EST; sysop Clyde Smith-Stubbs.
- Hotline: phone (07) 353 3718; 24 hours; sysop, Lionel Theunissen.
- Info Interchange C-64: phone (07) 200

- 7664.
- Kangaroo Point TAFE: phone (07) 391 3788; 24 hours; sysop, Troy O'Malley.
- Midnight Express: phone (07) 856 4363; sysop, Lloyd Ernst.
- MSL C-64: phone (07) 341 0285.
- Rapple — Q: phone (07) 284 6145; V21/22/23/22bis; sysop, T. Sweetser, G. Black and V. Crosdale.
- Telegold: phone (075) 31 6155.
- Tomorrowland RMSD: phone (07) 394 2300; 24 hours.
- Toowoomba Computer Centre: phone (076) 32 7542; weekdays 1800-0800, weekends 24 hours.

Where Do You Download It?

The information (and complete lists, when published) are always prepared with care, and are presented in good faith from information provided by various sources. Latest listings are always available through the following channels.

- ACT — PC Exchange RIBM, (062) 58 1406.
- NSW — Prophet BBS, (02) 628 7030;

AED-Prophet, (02) 628 5222.

Victoria — National BBS, (03) 819 5582.
 Queensland — Hi-Tech BBS, (07) 38 6872; Ampak PBBS/RCPM, (07) 263 7070.
 South Australia — the Electronic Oracle, (08) 260 6222.

Western Australia — Nemo Multiple BBS, (09) 370 1855.

Tasmania — Tassie Bread Board System, (003) 26 4248.

In Teledata, enter 'PAMS' from the command prompt.

Let Us Know

Please report any changes or new listings to: Australian PAMS Coordinator, Prophet Bulletin Board; PO Box E41, Emerton 2770; or on ACSnet as prophet@runx, on Teledata as prophet, or on the Prophet BBS (02) 628 7030.

And Thanx AED

It goes (almost) without saying that we are grateful for the support of AED System Developments who are covering the costs involved with the PAMS Registry.

Sakata DOT MATRIX PRINTERS Your Personal Computer Deserves the Unequaled Printer Quality of Sakata.



The High Reliability SP-1200 plus

- Fast and Neat, 120 cps
- Excellent Near Letter Quality mode
- Numerous modes, fonts and pitches
- Width from 80 column (PICA) to 136 column (CONDENSED)
- Very sharp BIT IMAGE graphics
- Adjustable sprocket and friction feed
- IBM-PC command compatible
- Parallel Centronics interface (serial option)

MOVING SPECIAL JANUARY

only \$525 including Sales Tax

Also available

SP-1500 180 cps, 80 column, NLQ \$779

SP-5500 180 cps, 136 column, NLQ \$1015

SOLE AUSTRALIAN AGENTS

EMONA COMPUTERS

PTY LTD

New Address:

86 PARRAMATTA ROAD, CAMPERDOWN, 2050. NEW TEL: (02) 519 3933

COMPUTER

Even for the serious computer user, computing is not always a straightforward business. When problems occur Computer Haven customers know they can trust us to get them on-line again. We have qualified technicians, experienced programmers, an expert technical team, and the fast reliable service that business needs. More than just a PC discounter, Computer Haven services and supports. For some very important people. Our customers. Call us today.

A SMALL PART OF OUR "PRINT OUT"

MODEMS

Netcomm	..... call
Nice Modem C64	..... \$299.00
Includes Vatel & BBS software	
Nice Modem RS232	..... \$279.00
Nice Modem IBM	..... \$339.00
Includes Vatel, terminal emulations, BBS software	
Nice Modem II	..... \$699.00
300, 1200, full duplex, 1200/75 Hayes compatible auto answer/dial	

BUSINESS SOFTWARE FOR YOUR IBM

Complete PC tutorial	..... \$64.00
DAC Easy Accounting	..... \$190.00
DAC Easy Accounting (Australian)	..... \$249.00
Filelok encryption/decryption	..... \$99.00
Microsoft Chart	..... \$495.00
Microsoft Windows	..... \$225.00
Microsoft Word Version 3	..... \$875.00
Norton Utilities 3.1	..... \$155.00
Perfect Writer	..... \$407.00
Perfect Calc	..... \$299.00
Perfect Filer	..... \$295.00
PFS Write/Spell	..... \$255.00
PFS Report	..... \$295.00
PFS Graph	..... \$295.00
Sideways	..... \$95.00
Borland Superkey	..... \$107.00
Borland Turbo database toolbox	..... \$85.00
Borland Turbo Editor toolbox	..... \$92.00
Borland Turbo Gameworlds	..... \$92.20
Borland Turbo Graphix toolbox	..... \$92.20
Borland Turbo Lighting	..... \$122.50
Borland Turbo Pascal W/8087 & BCD	..... \$145.00
Borland Turbo Prolog	..... \$139.95
Borland Turbo Tutor	..... \$55.00
VP Planner (Lotus work-alike)	..... \$225.00
Word Perfect V4	..... \$645.00
Timeline	..... \$725.00
Vatel Software	..... \$84.50
Supports Hercules card and telesoftware	
Symphony 1.1	..... \$1195.00

IBM HARDWARE

Dalson Colour/monochrome card	..... \$395.00
Supports monochrome or colour graphics output on a TTL screen	
Havenware Hercules clone	..... \$199.00
100% Hercules compatible	
Havenware 512K card (with 384K)	..... \$237.50
Havenware Multi I/D card	..... \$182.00
Havenware Multifunction card OK	..... \$195.00
Includes serial, parallel, joystick, clock, extra serial port option, room for 384K	
Havenware Multifunction card 384K	..... \$338.00
As above, fully populated	
Havenware AT Multifunction card	..... \$377.00
Supports up to 1.5M of RAM	
Havenware print buffer card	..... \$208.00
Havenware parallel interface	..... \$70.00
Taxan KIF3800	..... \$599.00
640 by 400 colour graphics	
Sigma 400 with paintbrush	..... \$1175.00
Quibie EGA card with 256K	..... \$595.00
IBM AT style	..... \$129.00
IBM AT style extended keyboard	..... \$185.00
Havenware Mighty Mouse	..... \$155.00

Microsoft Mouse serial	..... \$349.00
Microsoft Mouse bus	..... \$349.00
Orchard PCTurbo 286e	..... \$1749.00
High speed accelerator with no wait state 80286 co-processor & 1 megabyte of RAM	



Superb quality, sharp resolution, and an unbeatable price. Havenware green and amber composite monitors suitable for Apples, IBMs and Commodores. Only 100 available at this price!

\$165

APPLE HARDWARE

Havenware 80 column card	..... \$93.60
Features soft-switching, inverse & Video compatibility	
Extended detachable keyboard	..... \$179.00
Havenware Apple Fan	..... \$65.00
Apple II+/Ile lightpen card	..... \$165.00
Includes graphics software	
Autoice Ile extended 80 column card	..... \$99.00
Citech Flipper 1MEG memory card	..... \$716.00
Grappler Plus printer interface	..... \$56.00
Grappler Plus with buffer	..... \$155.00
Supplied with 16K buffer on board & cheaply upgrades to 64K	
Havenware 16K language card	..... \$78.00
Havenware PAL colour card	..... \$78.00
SAM voice card	..... \$55.00
Speech generation with software	
Taxan RGB card for II+/Ile	..... \$170.00
Taxan RGB extended 80 column card	..... \$385.00

APPLE SOFTWARE

Vatel software with telesoftware	..... \$84.50
Macwrite style word processor	..... \$129.00
Requires Ile or Iic	
Plusworks (allows Apple II+ to run Applesworks)	..... \$39.75
Plusworks XM (as above but with RAM card support)	..... \$89.95
Plusworks XM RAM PAK	..... \$199.00
Plusworks XM plus 128K memory	

MONITORS

Princeton HX12 colour monitor	..... \$799.00
Taxan Supervision III	..... \$825.00
Taxan Supervision III	..... \$1170.00
Taxan Supervision IV	..... \$1170.00
Quibie HR134 amber	..... \$299.00
Quibie HR31/200 colour monitor 14"	..... \$730.00
Quibie HR31/350 EGA	..... \$925.00
Quibie HR39 green	..... \$299.00

Taxan KX-1212 TTL green	..... \$306.00
Taxan KX-1213 TTL amber	..... \$314.00
1901 IBM compatible RGB	..... \$550.00
Thompson hi-res RGB	..... \$799.00
Thompson composite green	..... \$210.00
Thompson composite amber	..... \$210.00
Thompson TTL green	..... \$295.00
Thompson TTL amber	..... \$295.00

DISK DRIVES & TAPE BACKUP

Apple Chinnon disk drive II+/Ile	..... \$225.00
Silent operation: direct drive	
Apple Chinnon disk drive Iic	..... \$270.00
Switching power supply	..... \$120.00
Tandon 20 megabyte hard disk	..... \$1195.00
Tandon 20 megabyte hard card B.T.-20	..... \$1395.00
Includes \$100 worth of directory management software free	
Talgrass "Grasshopper"	..... \$1995.00
Talgrass 80 megabyte internal	..... \$6999.00

PRINTERS

Brother M1509 180cps & NLO 15"	..... \$799.00
Brother M1109 NLO	..... call
(LX80 & IBM graphics compatible)	
Brother M1109 NLO for Apple Iic	..... \$499.00
Brother Twinwriter	..... call
Citizen MSP-15 160cps & NLO 15"	..... \$999.00
Citizen MSP-20 200cps & NLO	..... \$950.00
Epson LX86	..... \$575.00
Star NX10	..... \$429.00
Other star printers	
Microline Okimate 20	..... \$599.00
Microline ML84 (500cps draft model)	..... \$1599.00
MSP 1000 Commodore/IBM compatible	..... \$549.00
Riteman C+	..... \$599.00
Riteman F+	..... \$165.00
Olympia NP 165cps Epson compatible	..... \$540.00
Quadram Quadjet colour inkjet	..... \$699.00

COMPLETE SYSTEMS

Call or write for quotations on:	
Toshiba 1500	..... Toshiba T1100
Olivetti M24	..... Olivetti M28
Olivetti M19	..... Olivetti M21
Divivetti M245P	..... IBM PC/XT
IBM AT	..... HP Vectra
Adler P50	..... Adler P60
Zenith micro's & Apricot's call.	

MEMORY CHIPS

4164 64K-bit RAM chip (each)	..... \$2.90
64K memory upgrade kit (9 chips)	..... \$26.10
41256 256K-bit RAM chip (each)	..... \$6.95
For Divivetti's, turbo mother boards, etc	
128K IBM AT piggyback chip (each)	..... \$9.00

ACCESSORIES

Baud rate converter	..... \$99.00
Disk notcher	..... \$12.00
S550 3.5" disk storage container	..... \$28.00
Printer stand	..... \$29.95
Taxan KIF4308 print buffer	..... \$389.00
64K-256K external parallel	
*You must present or quote this advertisement to receive this special price	

PRICES SUBJECT TO CHANGE WITHOUT NOTICE
ALL PRICES INCLUDE TAX UNLESS OTHERWISE STATED

COMPUTER HAVEN

LOTUS • MICRO GENERAL • QUIBE • CANON • TALLGRASS • ADLER • ORCHARD • HERCULES • AST • BORLAND • CITIZEN • PRINCETON • THOMPSON • QUADRAM • CIRTECH •

One of the most outstanding successes in computer communications has just got better! The Australian made, Telecom approved, Super Modem communicates at 300, 600, 1200 or 1200/75 baud rates and supports both world standard (CCITT) and American (BELL) protocols, and now comes with a 12 month warranty. Add to that a built in telephone, intelligent design (no more dip-switches to fiddle with) and auto-answering!

COMMODORE VERSION

Comes complete with Viatel software and terminal software. Upload and download files, and emulates an 80 column screen via high resolution graphics!

IBM VERSION

Includes Viatel software now with Hercules graphics card and teledownload support, and terminal software. Upload and download ASCII, XMODEM, Viatel, or Kermit files, emulate mainframe terminals including the IBM-3101, VT-100, VT-52, TV-910/920, H-19 and more... Windows, colour options, special protocols, the works!

SPECIFICATIONS:

BELL 103, BELL 202, CCITT V21, CCITT V23 (Mode 1) 600 baud half duplex, CCITT V23 (Mode 2) 1200 baud half duplex with or without an equaliser, Videotext 1200/75 or 75/1200 (switched), Power supply and telephone included, Standard RS232C interface or connects to user port (Commodore version).

RS232 version:	\$279
Commodore 64 or 128 version:	\$299
RS232 version with IBM software:	\$339

THE FIRST NICE MODEM



SUPER NICE MODEM II

What's HAYES compatible, auto-dial, auto-answer, 300 and 1200 baud full duplex, Viatel 1200/75 and 75/1200 compatible, supports BELL and CCITT, has auto-baud rate detection, microprocessor controlled "intelligence", a CMOS battery backed memory, built-in mini-computer style security features, comes with a great selection of software (as above) and costs \$500 under its nearest competitor? Our Nice Modem II!

(Note: phone hand set and Viatel software optional.)

\$699 inc. tax \$749 Includes Viatel software



THE COMPUTER HAVEN GUARANTEE

- **20 YEARS OF CUSTOMER SERVICE.** Five in the microcomputer industry. Which means, unlike some of our competitors, you can feel safe in the knowledge that you'll get what you ordered, and that you'll get it on time.
- **10 DAY RETURNS ON ANY HARDWARE!!** If you don't like any hardware product — for any reason — return it for a refund.
- **HUGE INVENTORY.** We're much bigger than any of the so called "computer warehouses". Your order will probably be dispatched ex-stock (subject to availability by the distributor).
- **THE PRINTOUT.** Customers receive our computer generated price bulletin which includes thousands of computer products and hundreds of unbelievable specials on all types of computer equipment, and our industry newsletter that lets you keep tabs on new products, new versions, and anticipated future pricing.
- **COMPUTER DISPATCH.** Orders are entered into, and processed by our computer. You can contact us to check the status of your order at any moment.
- **SERVICE & SUPPORT.** Any company can claim service and support, but we have specifically employed qualified technicians, programmers and technical staff to help you via our hotline or electronic mail facilities. We're on duty Mon-Fri 9:00 am to 5:30 pm and Sat. 9:00 am to 2:00 pm.
- **EXPERTISE.** Various publishers and editors have published over 100,000 words of what we've written internationally and on every aspect of computing, from industry comment to microprocessor software design. Reputation is our highest concern.
- **OUR CUSTOMERS.** Needless to say, many of our customers are also acknowledged as "the best in their respective fields". That's why corporations such as:
 - ICI
 - Control Data
 - Galtex
 - Dixiad
 - TNT Bulkships
 - National Springs
 - Wormald
 - Waugh & Josephson
 - Data Systems
 and government organizations such as:
 - AUSSAT
 - The Australian Atomic Energy Commission
 - The Department of Main Roads
 - The Department of Lands, etc.
 - CSIRO
 - Telecom
 - Australia Post
 - most universities
 and even the Premier's Department have purchased from us.
- **INQUIRIES.** We're also on Viatel. See our Viatel presentation on pages 2, 4, 8, 7, 5, 3 or contact us direct on "23492366". If you have a 300 or 1200 baud modem you can log on to our computer after business hours on our business number, and of course, you're welcome to come into our Sydney computer retail outlet at any time.

(02) 349 2366

COMPUTER HAVEN

CONSULTANTS TO THE MICROCOMPUTER INDUSTRY

183 Maroubra Road, Maroubra Junction, N.S.W. 2035



Our Support Team



IT'S DIFFICULT now to imagine Lotus as a small company, but it was once, with everything revolving around the genius of Mitch Kapor, who has now resigned from Lotus. What difference will this make? Probably not much; Lotus is now a big corporation and such innovative leaps as 1-2-3 are now less likely.

For example, although the 1-2-3 graphing is great for analysis and has been beefed up in Release 2, it isn't all that good for presentation graphics. Lotus chose to rectify this, not by developing something itself, but by buying out Graphic Communications, which produces Graphwriter (standalone graphics) and Freelance (to enhance 1-2-3 graphics). Both these products were already on sale in Australia, but in future they will be marketed by Lotus. Hopefully I'll be able to report on them soon.

An area of some concern has been Lotus' update policy. When Release 2 of Lotus appeared it was not greeted with cries of joy by all people; in fact many were content to stay with Release 1A. What was not immediately apparent was that as soon as Release 2 came on the market Release 1A was discontinued and you couldn't buy it any more. This was bad news for companies with a large installed base of Release 1A, who now have to upgrade at high cost or face the problems associated with using two different versions of a program. It was also bad news for those who heard about the bugs in Release 2 and were dubious about upgrading to a flawed program.

Imagineering has publicly admitted it was an error not to keep Release 1A on sale, but to Lotus we're probably small-fry, so it probably doesn't matter what Australia thinks.

Now Lotus has come out with Release 2.01, which is claimed to have fixed many of Release 2's shortcomings, particularly slow save and retrieve times. Release 2.01 is described as a "low-key maintenance release", and details should have been sent to all registered users. Again, Release 2 will be discontinued. If you are buying 1-2-3 you'd better check you are getting 2.01, because presumably copies of Release 2 are still in dealers' hands.

Imagineering's charges for upgrades to Release 2.01 are:

Release 1A bought before 1.8.85: \$250

Release 1A bought after 1.8.85: about \$55

Release 2 — about \$55

Now that the government is levying a 20 per cent sales tax on software, the figures

An area of some concern has been Lotus' update policy. When Release 2 of Lotus appeared it was not greeted with cries of joy by all people; in fact many were content to stay with Release 1A. What was not immediately apparent was that as soon as Release 2 came on the market, Release 1A was discontinued and you couldn't buy it any more.

quoted may rise by that percentage, but I understand the current prices will remain until the end of the year.

In the case of any upgrade, we've been told the major cost is that of freighting the software from the United States. This can be quite high because of the way some companies are releasing products with bulky, heavy documentation. I can sympathise with Imagineering when it says it must pass this cost on to the consumer; what I don't see is why the consumer should have to pay *anything* to 'upgrade' from Release 2 to 2.01 just because Lotus couldn't get it right the first time. Why should we have to pay for their mistakes?

Other news from Lotus is that it does not intend to offer site licensing, but it will supply un-copy-protected copies to "some" corporations. One criterion is Lotus' perception of the corporation's honesty, but another is size. Lotus' definition of a "large" corporation might include BHP and the Australian government, but few others.

A New Local Product

Recognising that the printer strings used to send spreadsheets to the HP laser printer are long, complicated and difficult to type, Scott Marshall has written a program that converts plain-English commands into those required by the printer. The program also solves the problem of

some printer set-up codes being too long to fit in the space available. Scott has put the program into the public domain and will sell copies on disk at \$10 each. I haven't tried it yet but it sounds good. To order, contact the Sydney Lotus Users Group (GPO Box 5010, Sydney 2001; phone (02) 290 3655).

Commands in 1-2-3

In September's *Hotline* we went through all the /Worksheet commands in Lotus 1-2-3 Release 2. This time we'll go through some more commands, starting with the /Range commands.

The /Range commands work with a range of cells, from one cell to the whole worksheet. Most of these commands have their counterpart in the /Worksheet commands, which affect the whole worksheet. The /Range commands are: Format, Name, Unprotect, Transpose, Label, Justify, Input, Erase, Protect and Value.

/Range Format is similar to /Worksheet Global Format. The choices are: Fixed, General, Time, Scientific, +/-, Text, Currency, Percent, Hidden, (comma), Date and Reset.

As most of these were described in the September column under /Worksheet Global Format, I won't repeat what I said there. The only additional command is /Range Format Reset, which restores the default format for the range you specify. However I find I omitted one.

/Range Name Table lists all existing range names and addresses alphabetically. When using this command you have to specify the top left cell of the range where you want the list to appear. Use an empty part of the worksheet, because the table will overwrite any data in the range.

/Range Justify — when you type a label that is too wide to fit in a cell, the label is left-aligned and it will spread into any blank cells on the right (Lotus refers to this as a "long label"). /Range Justify allows you to specify the width of the lines in a 'paragraph' (a single column of consecutive labels terminated with a number, a formula, or a blank cell). Note this is not 'right-justified'; the right margin is ragged.

/Range Protect prevents a cell from being changed if the cell is protected and protection is on (enabled). You use /Range Protect if you are creating a worksheet for someone else to use and you want to make sure they don't change or delete some parts of the worksheet.

In a new worksheet, all cells are protected, but protection is not enabled. It can be

enabled by **/Worksheet Global Protection Enable**. If you do enable protection, you cannot change the contents of *any* cell unless you use **/Range Unprotect** to unprotect a range of cells.

/Range Input takes the concept of cell protection one step further. When it is in operation — usually within a macro — the user is prevented from moving the cell pointer to protected cells (as a matter of interest, this is the only time you can type cell entries in the middle of a 1-2-3 command).

/Range Value is used when you want to copy the values of formulae, not the formulae themselves, to another part of the worksheet. This command will overwrite any cells that contain entries.

/Range Transpose changes rows to columns or columns to rows.

The **/Copy** command creates exact copies of a range in another part of the worksheet. There are three types of cell addresses: relative, absolute, and mixed (part relative, part absolute). The differ-

ences between relative and absolute addresses need explaining.

In the spreadsheet in Figure 1, the formula for cell B7 is **@SUM(B3..B5)**. Now let us add another column (see Figure 2).

We know the formula we need in cell C7 is similar to the one in B7; in fact it will be the same if we change B to C. When we tell 1-2-3 we want the formula in B7 to be **@SUM(B3..B5)**, it doesn't look at the address of each cell (B3, B4, B5); instead it says "add the cell four rows up to the cell three rows up to the cell two rows up". That is precisely what we want to do in C7. If we 'copy' the formula from B7 to C7, the copy carries the 'meaning' of the formula, not its address. Thus, in the copied formula, the 'relative' addresses are shown, and the formula appears as **@SUM(C3..C5)**.

In the spreadsheet in Figure 3 we are assuming that 12 per cent of all expenses will be regarded as travel costs. So the formula for E3 is **12*15.9/100**, which we'll enter as **+D7*C3/100**. But if we 'copy' this formula to E4, we'll get **+D8*C4/100**,

which isn't what we want. We want to keep D7 constant — in other words we want to keep its address 'absolute'. We do this by putting \$ in front of the absolute address — the formula in E3 then becomes **+\$D\$7*C3/100**. When you 'copy' this to E4 it becomes **+\$D\$7*C4/100**. This isn't as complicated as it may appear at first glance!

In using **/Copy** you simply indicate the range to copy 'from' and then the range to copy 'to', although you need only specify the upper-left corner of the copy to. Don't overlap the 'from' and 'to' ranges.

/Move works in a similar fashion to **/Copy**, the only difference being that after a Move the data moved exists only in the 'to' range; in a Copy it exists both in the 'from' and 'to' ranges.

The next group, the **/File** commands, are used every time you enter or exit 1-2-3. You use them to save your files on disk so you can subsequently retrieve them.

The **/File** commands are: Retrieve, Xtract, Import, Save, Erase Directory, Combine and List.

Filenames in 1-2-3 follow the same rules as in DOS: they can be up to eight characters, which can be any combination of letters and numbers, but not spaces. Lower-case letters are converted into upper case. Some other punctuation symbols (such as the underscore) are acceptable, but unless you know exactly what they are it is wise to stay clear of them. Don't use the DOS-reserved names AUX, CON COM1, COM2, LPT1, or PRN. Don't use a filename extension, because 1-2-3 adds one itself: .WK1 for worksheet files, .PIC for graph files, and .PRN for print files.

/File Retrieve first erases any worksheet displayed on the screen (the 'current' worksheet), and then retrieves the worksheet you asked for from disk — unless it's password protected, in which case you will be prompted "Enter password".

/File Save saves the current worksheet to disk. Unless you specify otherwise it will assume you want to save it to the same file you retrieved. If the worksheet has been changed, you are prompted to see if you want to replace the existing file. This can be a trap, as it is quite easy to reply 'Yes' automatically and overwrite your worksheet with a blank one.

/File Combine incorporates all or part of a worksheet into the current worksheet. Before issuing this command, you have to place the cursor in the upper-left corner of the worksheet being combined. If you are combining a lot of files you are less likely ▶

Figure 1.

A	B	C	D	E	F
1	STATE	INCOME			
2					
3	NSW	27.2			
4	VIC	24.6			
5	QLD	15.9			
6					
7	TOTAL	67.7			

Figure 2.

A	B	C	D	E	F
1	STATE	INCOME	EXPENSES		
2					
3	NSW	27.2	15.9		
4	VIC	24.6	11.2		
5	QLD	15.9	10.8		
6					
7	TOTAL	67.7			

Figure 3.

A	B	C	D	E	F
1	STATE	INCOME	EXPENSES	TRAVEL	TRAVEL
2				%	COSTS
3	NSW	27.2	15.9		
4	VIC	24.6	11.2		
5	QLD	15.9	10.8		
6					
7	TOTAL	67.7	37.9	12	

to make a mistake if each one has cell A1 as its corner.

Your first choice is Copy, Add or Subtract. Copy simply replaces any entries in the current worksheet with the incoming values. Add adds numeric values to the numeric values in the worksheet, but if an incoming value would overlay a label or a formula no change is made. Subtract works in the same way as Add, except the numeric values are subtracted instead of being added (pretty logical, huh?).

Your other choice is between Entire-File and Named/Specified-Range. Entire-File is obvious enough. Named/Specified-Range lets you use a named range or one specified by its co-ordinates.

/File Combine works only with 1-2-3 files; to bring in files created by other programs you use **/File Import**.

/File Xtract stores part of a worksheet in a file. You have to choose between Formulas and Values. Formulas saves the formulas themselves, while Values saves their current values. When you carry out the

command, 1-2-3 adjusts cell addresses in formulae. 'Relative' addresses (refer to the Copy command above) retain their relative meaning: "the value of the cell three rows to the left and four rows up". 'Absolute' addresses are adjusted to reflect the difference between cell A1 and the upper left corner of the Xtract range.

/File Erase deletes a file or files from your disk. You first choose the type of file from Worksheet, Print, Graph, or Other. The first three have had a filename extension added by 1-2-3, so you need to type the extension only if you select Other. You can use the DOS wildcard characters: ? matches any single character and * matches all remaining characters.

/File List displays a list of the filenames in the current directory. As with **/File Erase**, you choose the type of file: Worksheet, Print, Graph or Other. As well as listing the files, the display shows the details of the file highlighted: date, time, and size in bytes. 'Other' isn't quite the right description; this choice actually displays

all files. The usually accurate Help screens go wrong here; this command doesn't list available storage space, and you can't press any key to clear the screen — Enter is a safe choice.

/File Import incorporates the entries stored in a print file (.PRN) of a worksheet. You may have to rename files created by Other in order for them to have the .PRN extension. You need to have a standard ASCII file; most word processors that normally don't produce such files (notably Wordstar) have an option to allow you to work with ASCII files. You choose whether you want the file to be text or numbers. With text you get a single column of left-aligned labels. To convert a column of imported labels into several columns of labels and numbers, use **/Data Parse**.

/File Directory allows you to change the current directory. This isn't a permanent change; to change permanently use **/Worksheet Global Default Update**.

That concludes the File commands. Next time: the Print commands.

BINDERS

Please send me (a \$8.00 each = \$
 PLUS postage & handling (a \$2.90 each = \$
 For TOTAL
(Magazine Name)

() I enclose my cheque/money order (with this form in an envelope) for \$
(make cheques payable to: The Federal Publishing Co.)

() Charge my () Bankcard () Mastercard
 () Amex () Visa with \$

Card No:

Signature: Expiry / /
(Unsigned orders cannot be accepted)

Mail Post Free in Australia to:
Federal Direct
Freepost No. 4 P.O. Box 227 Waterloo, N.S.W. 2017

Name:
Mr Mrs Miss Ms Initial Surname

Address:

..... Postcode

Date of Order: / / Telephone ()



Can't Find It? File It!

THE IDEAL GIFT FOR REGULAR READERS!

These attractive, ready to use, skyblue vinyl binders have been specially designed to hold and protect 12 of your valuable magazine collection in the easy clip-in fastener wires.

The Origins of the Apple Species

ONE OF THE MAJOR changes in micro-computing in the past few years has been the development of evolutionary pathways. Until quite recently we had development-by-discontinuity. A company would produce a machine based around a certain chip, then within a year or two, they'd be bringing out a "newer, faster, more powerful" machine based around something entirely different.

Sure, they could transfer their expertise and experience, but the new design inevitably meant a shortage of software, newer and more exciting bugs in the operating systems and untested and unwanted mechanical design features. These have been a fact of life for computer users.

That now seems to have changed, partly, I suspect, because the industry has shaken down into only a couple of systems that matter — the IBM and compatible lines, the Macintosh, and the Apple II. Now no one really cares much if something newer, faster and more powerful comes along — as it has recently with both Commodore and Atari machines. The value of evolution over revolution is apparent to all.

This seems to have come about mainly because the chipmakers are concentrating their efforts in this direction. We are getting families of chips, with each generation preserving compatibility with the last, while each takes the design into new areas. IBM has had a design path through the 8086, 80286, and 80836 chips, and the Mac has done the same with the 68000 migrating to the 68020.

Apple's new II GS, when you think about it, has the longest evolutionary path of all microcomputers — although it is nowhere near as long as some of the mainframes. We are now at the stage of meeting Apple hackers who weren't even born when the first Apple rolled out of that historic, southern California garage.

And although Apple has never been keen to emphasise the fact, we had a number of obvious and subtle changes to the inside workings of the II series over the years, but none more than the jump to the 65816 chip of the II GS.

It remains to be seen, of course, exactly how compatible the new machine is with the old software. We are now too careworn and cynical to accept without comment the claim that something is 99 per cent compatible. Does it mean that only one program in every 100 won't work? Or

We are now at the stage of meeting Apple hackers who weren't even born when the first Apple rolled out of that historic garage.

does it mean that one line in every 100 lines of code crashes? The distinction is rather important!

Raising the Standard

Also arising out of the relative stability of these evolutionary pathways is a way of dealing, to a degree, with the old problems of standards. Apple, to its cost, took a long time to discover that IBM *did* control the business marketplace. But fortunately, John Scully, coming from outside the company to manage it, saw the obvious and accepted the inevitability of IBM domination — in the near-term, anyway.

The GS didn't arrive with any magic black box or plug-in board that enables it to run IBM software, although the rumours have been flying thick and fast over the past couple of months. I imagine it's only a matter of time.

Both software and hardware developments that destroy the old ogre of standards incompatibility can't be too far away now. The II GS was released with a new Lotus look-alike program, called VIP, which looks and runs like a Macintosh program, and can port data from IBM's Lotus 1-2-3, Macintosh's Excel, and the old Apple IIe's Appleworks. That's not bad for a new program on a brand new machine.

The other value of evolutionary pathways is in providing designers with time and experience to think about, and work out, their interfaces. I am thinking here mainly of the interface between me and the machine.

Appleworks is a good example of the effects of evolutionary change. There's nothing new, original, or unusual about the program, except that it does everything it sets out to do, extremely well. It's a no-fuss, no-nonsense type of integrated program, and once you've used it for a while you forget it's there.

A few years back we had quite bitter controversies over whether word processing programs should be command-key driven, or run under menu-selection. I

wouldn't have used a menu-based word processing program for the proverbial 'million-quid' at the time — they were all too slow and tedious.

Now, with intelligent design, a balanced reliance on menus, and consistently-used command keys, Appleworks represents, to me anyway, almost a perfect balance. All I now want is for Lisner to modularise it, so I can make up a program disk to my own needs.

What would happen if (when?) Appleworks were translated to a Macintosh? We'll probably find out from experience with the mouse-driven II GS. Will anything be gained by making the menus drop from the sky on roller blinds? Will the mouse be quicker and simpler than the cursor keys? I hesitate to record an opinion — I've been wrong too often in the past.

I do believe, however, that Macintosh software has recently shown the need to come back from an entire mouse-and-roller-blind approach — in word processing software at least.

It's interesting that the 'mouse vs non-mouse' argument took over where the 'menu vs non-menu' controversy left off.

Room to Choose

When I look around my office at the various reporters hammering away on Macs, it is noticeable how many of them choose to use command-key sequences rather than the mouse. But, at least with the new Macs they have a choice. By the same token, I'll bet that almost all of our writers started off using the mouse — and this is probably the most important point.

We all tend to get carried away by the flashiness of new advanced features in hardware and software, but really what we want is simple, direct, functional programs that are intuitive and consistent in use. They need to take into account the needs of novices and experts, constant and occasional users, hackers and computer-phobes.

This might sound like a tall order, but, after all, the computer is supposed to be the 'universal machine', so it should be chameleon-like, both in its ability to change to suit the circumstances, and in the sense that it merges into the furniture. When you work with a computer, after a very short period you should no longer really be aware of its presence.

The II GS looks like it might be such a machine, and it's certainly got the software. □

LETTERS TO THE EDITOR

We are happy to receive your comments and, if they are of interest to other readers, publish them. Letters will only be considered for publication if they include your name and address, although we can withhold such details from publishing on request. Note that we reserve the right to (and probably will) edit all letters for the sake of brevity, clarity or accuracy.

SUBSCRIPTIONS

Standard 12-issue rate within Australia: \$35.40. Surface rate for New Zealand and Papua New Guinea: \$51.80; airmail rate: \$57. Rates for other countries on application. All overseas rates quoted are to be paid in Australian dollars. Allow up to eight weeks for subscription processing.

BACK COPIES

Back copies of *Your Computer* are available from The Federal Publishing Co, PO Box 227, Waterloo 2017 at AS4.00 each, including postage for Australia and New Zealand. We will supply photostat copies of articles where a back issue is not available, at the single-magazine price for each feature copied. A special service is offered for Tutorials: see below.

TUTORIALS

All Parts of Tutorials published within the last 2 years are available as photocopies for a charge of \$0.50 per Part plus \$4.00 for postage and handling within Australia (overseas postage additional). Please identify the Tutorial by its complete name and specify the Parts by number or the issue of publication. All but the latest of our Tutorials are listed in our 5-Year Index, published with our July 1986 issue.

READERS' ENQUIRIES

We will make every effort to answer readers' written enquiries, if accompanied by a stamped, self-addressed envelope, although staff shortages and deadline pressures may cause delays. Please include your telephone number(s) with any enquiry. Phone enquiries not related to subscriptions, readers' advertise-

ments, or other 'service information' cannot be accepted.

COPYRIGHT

All material appearing in *Your Computer* magazine is copyright and cannot be reproduced in part or in full, by any means, without the written permission of the Publisher or Managing Editor. Computer clubs and schools can, however, apply for restricted permanent reproduction rights for non-commercial, limited-circulation use (for example, newsletters and class instruction). Given that it sometimes takes us a while to answer such requests, you can consider that restricted permanent rights apply in these cases from the day you send in your letter, and will later be confirmed (or withdrawn) by our reply.

LIABILITY

Although it is policy to check all material used in *Your Computer* for accuracy, usefulness and suitability, no warranty, either expressed or implied, is offered for any losses due to the use of any material from this magazine.

EDITORIAL CONTRIBUTIONS

Contributions to *Your Computer* are welcomed and will be given every consideration. Although the greatest care will be exercised with contributions, no responsibility can be accepted for the safety or return of any letters, manuscripts, photographs or other materials supplied to *Your Computer* magazine. If return is desired, you should include a stamped, self-addressed envelope. If return is critical — say it's something you can't afford to lose — then don't send it; we *are* careful, but we're not perfect. Please read these notes carefully to get an idea of the style and format we prefer.

All Contributions: should include your name, address, and home and office phone numbers (in case we need to check details). Each page of your submission, and any material sent with it, should also carry your name.

Contributions by Telephone: Contributors who have modems and suitable software (in the MODEM7/YAM mould — see our stories on Christensen Protocols in the May and June 1983

issues) can arrange direct transfer to our computers through our Bulletin Board system, which is on-line 24 hours a day, seven days a week. Contact our office by phone for details on transferring material in this way.

Contributions on Disk: Contributions can be accepted in most disk formats, although some have to be converted outside our offices, which will add to the (often lengthy) delay between receipt and acknowledgement. The preferred medium is IBM standard format single-sided, single-density, 20 cm CP/M disks or IBM PC-DOS minifloppies. We can also handle, in-office, most soft-sectored 13 cm disks, thanks to PC-Alien — so unless you have a particularly strange format, send it on disk straight from your machine. Please pack them extremely carefully if posting and label all disks with your name, address and phone number.

Listings: Unless it is absolutely impossible, we want listings produced on the computer. This reduces the risk of error — if the computer typed it, the computer probably accepted it. Print listings with a dark — preferably new — ribbon on white paper, and try to format the output to a narrow (40 characters) width. If they can't be produced on a printer, borrow a good typewriter — hand-written material is likely to sit around the office for a year before someone can find time to type it all out for you! Please provide an account of what the program does, how it works and so on. Any comments on the program should refer to the address, line number or label rather than to a page number. Any comments on modifying the program to work on other machines will be appreciated. Try to include a printout of at least part of a sample run if possible.

Style: All items should be typed (or printed) and double-spaced on plain white paper. We will only accept original copies — no photostats. Include your name, address, telephone number and the date on the first page of your manuscript (all manuscript pages should have your surname and page number in the top right-hand corner). Be clear and concise, and keep jargon and adjectives to a minimum. □

AD INDEX

AED System Developments	89
Amsnet	104
Apple Australia	25,26,27
Automatic Ice Co	88
Barries Pty Ltd	41
Blue Sky Industries	138
Centre Industries	100
Computer Business Systems	9
Computer Factory	101
Computer Haven	154,155
Computer Print and Paper	120
Creative Computing	98
Custom Made Software	40
Cypher Research	87
Discware	58,59
Dynamic Graphics	63
Earth Computer Systems	57
Electronic Solutions	92
Emona	23
Entercom	139

FBN	30
Federal Merchandising	14,158
Genesis	20,143
Glyphic Software	161
Hales and Rodgers	55
Hi-Tech Software	4
Hypac	36,67,82,83
Interface Publications	84
JED	100
Keller Automation	OBC
Linea	71
Logo	89
Mace Reel Pty Ltd	121
Maclagan Wright & Assoc	119
Micro Educational	94,106,107
Micro General	123
Microshack	33
Microway	127
Moncrieff	IBC
Nashua	IFC
NEC	13

Osborne Australia	146
Ozisoft	70
President	42,43,147,148,162
Ritronics	75
Sant Technology	17
Seasearch Pty Ltd	86
Select Software	6,7
Software Express	12
STC	49
Stemsoft	153
Subscriptions	130,131
Techflow	104
Telecom Australia	129
Telecorp	91
Toshiba	10,11
Tully	74
Typequick	161
Utilico	141
Verbatim	116
Vizden	28

FREE READERS' CLASSIFIEDS

For the C-128 lane, a word processing/filing system, on three disks — \$20. And a Mouse, alternate joystick — \$80 unused. Scott Starling, Box 33, Bexley 2207.

Microbee Game
Supergolf is a semi-arcade game with realistic effects. Tapes \$13.50, 9cm disks \$19.50. Contact G. Gardoz, Ascot School Residence, 3364.

ACT VIC-20 Bi-monthly Magazine
Many interesting programs and articles. December issue \$2; subscription \$12 a year. Write to Chris Groenhout, 25 Kerferd Street, Watson 2602.

VIC-20 Program Library
High-quality games, utilities, educational and miscellaneous programs available. Send SAE to Chris Groenhout, 25 Kerferd Street Watson 2602, for a list.

Wanted — CP/M Books and Programs
Will pay good prices. Contact E. Plunkett, 7 Hill Street, Eugowra 2806; (068) 59 2472.

Apple Games
Original games for the Apple II

series, all below \$20. For a catalogue, write to M. Bantick, 4/129 Glenhently Road, Elwood 3184.

VZ200/300 Games
Listings of VZ200/300 games — \$2 each. For details send SAE to 176 Wollongong Road, Arncliffe 2205.

Apple Software Swap
Send list to Michael Chan, 24 Stone Street, Earlwood 2206, for swapping arrangements

For Sale
Printers. One Honeywell 5 by 7 dot matrix, 38 cm, tractor-feed, 1200 BD RS232 Gc. One Decwriter 5 by 7 dot matrix, 80-character, tractor-feed, 300 BD, RS232, on stand E.C. Both with keyboard. Best offers. Contact Keith Vriens on (052) 21 3658 or (VK3 AFI); or write to 204 Myers Street, Geelong 3220.

For Sale
IBM-compatible multifunction board — AST Six-pak Plus — \$225 complete and in its box. Phone Doug Stevens in business hours, on (02) 359 3125.

Wanted
VZ200/300 programs: games and

so on. Also any new information. Write to D. Kennedy, 5/70 Ninth Avenue, Campsie 2194.

Printer Buffer Upgrade
My \$39 8 Kbyte-to-256 Kbyte Centronics Parallel Printer Buffer Kit now has an optional plug-in 75-19200 baud serial converter board — \$18; and a printer-sharer board — \$12 For more information, send SAE to Don McKenzie, 29 Ellesmere Crescent,

Tullamarine 3043
Microbee Tape-to-Disk
Transfer protected tapes and run without a start address. Tape — \$8.90. Contact John Arnold, 36 Victoria Street, Rooky Hill 2766; (02) 625 8950.

Wanted
Footnote program to buy. Compatible with Wordstar (CP/M-80), Phone Doug on (02) 587 4989 ah, (02) 579 0403 bh. □

POOR PERSON SOFTWARE FOR COMPUTERS RUNNING CP/M

WRITE-HAND-MAN — Desk Accessories for CP/M 2.2 or CP/M 3.0! Save notes, check a 'phone list', update a diary, scan disk directories or text files, do decimal and Hex calculations, define and use eight key macros, cut and paste, check an ASCII table — from within wordprocessor, data base, spread sheet or other CP/M programs! Use with Ram disks, keyboard extenders and ZCPR. Source code included helps you write your option! State computer model and CP/M version when ordering \$47
MAILING LABEL PROCESSOR ... \$40, **CROSSWORD GAME** ... \$27,
SPELLING CHECKER ... \$27, **PRINTING SPOOLER** ... \$40, **SPREAD SHEET** ... \$40
MITEK RELOCATABLE Z80 MACRO ASSEMBLER ... \$67. Including Linker/Library Manager \$95 Full Package including Mitak Symbolic Debugger ... \$125, for versatile assembly language programming. Write for descriptive catalogue. All prices include pack, post and sales tax. In popular formats, e.g. Microbee 3-1/4", 5-1/4". Kaypro II, Osborne OD, Xerox 820, Televideo 802/803, 8" SSSD Apple II CP/M and Amstrad 3" CP/M \$3 00 extra.
Order with cheque or money order. Order also with Bankcard or Mastercard — send signed order, card number and expiry date.

GLYPHIC SOFTWARE,
PO BOX 391 PENNANT HILLS 2120

Connect your Brain to your Computer.

You can make the connection with your hands in less than a week simply because the computer makes it quick and easy.

Once you can touch type you will be able to transfer your thoughts and information through this connection at an incredible rate — faster than hand writing.

Typequick IV. The way to feel totally at ease with your computer.

Typequick — the professional keyboard training course; a proven success with thousands of people
● In hundreds of large corporations, colleges and homes.
● By executives, managers, students and professionals. Sold throughout the world! Winner of "Top Australian Software of the Year 1985."

Runs on most computers — PC DOS, MS DOS, APPLE IIE/IIC, CP/M, CP/M86. Distributed by IBM, DEC and Tandy and sold by considerate dealers.

TYPEQUICK™

Make the connection — Order today.

Send coupon to Typequick Pty Ltd, 16 Cecil Street, Gordon 2072 or phone 498 7433. Please include \$87. Please attach your Business Card.

Enclosed is a cheque/money order for \$ _____ Payable to TYPEQUICK

Please credit my Bankcard/Mastercard _____ Signature _____

Expiry Date of Credit Card _____

Card No. YC 1 87

Name _____ Title _____

Address _____ Postcode _____

Computer Type _____ Operating System _____

MegaFax

MegaFax enables users of PAgEmaster products to both send a graphics file to remote facsimile machines, and to receive fax transmissions on their PC's for editing or for printing on the system's laser printer. MegaFax serves as an image transfer utility between PAgEmaster 300 dpi graphic images and Group III fax file 200 dpi images. Combined with AVR's MegaScan Image/Text Editing software and high quality HP LaserJet compatible fonts, facsimile images of unprecedented clarity and content can be quickly composed and sent worldwide.

AVR uses GammaLink's fax modem board and software as the PC to phone line interface. By using the GammaFax high-speed PC-to-PC file transfer capability, PAgEmaster users have the option of avoiding the 200 dpi resolution of Group III fax machines and transfer 300 dpi images directly between similarly equipped PC workstations at rates up to 9600 bits per second.

MegaFax Features

- *PC to Group III FAX transmission
- *FAX-to-PC reception
- *PC-to-PC communication at 9600 baud
- *Automatic 300 dpi <-> 200 dpi scaling
- *Compatible with MegaScan and AVR-300 Image Scanner
- *Mouse driven user interface



ALL IN ONE.



Introducing the Freedom[®] ONE from Moncrieff

The Freedom ONE is the one terminal for all of your ASCII needs. With the Freedom ONE you don't pay more for advanced features. With the Freedom ONE you don't sacrifice features just because you pay less. The Freedom ONE gives you the best of all worlds — in one terminal.

The Freedom ONE is designed to be there with all the features you need whatever your application. A 14-inch flat screen gives you the ultimate in crisp, clear characters in either 80 or 132 column display formats. Popular emulations like Freedom 200, WY-50, Viewpoint A2, TeleVideo 950, and ADM 31 let you fully utilize all your existing applications programs.

An adjustable height keyboard with 44 easy to program keys (88 with shift) lets you tailor the key layout and functions to your liking. Compact and attractive styling gives your workspace a state-of-the-art look with room to spare. These are just a few of the no-compromise, unbeatable features you get standard with the Freedom ONE.

For more information call Moncrieff, toll free today (008) 999 254, or (09) 325 5722, and ask for it all. Ask for the ONE.





PERFECTION. IT COMES IN MANY FORMS.

At Nashua, we believe there should be only one standard in diskette manufacture. Perfection. That's the standard we work to.

Every diskette is manufactured 100% error free, because at each stage of production our diskettes are "statistically control" checked, to make sure the quality is "built in," every step of the way.



Additionally, Nashua guarantees each diskette for life.

That's the kind of quality, consistency and guarantee you have to insist on in today's demanding computer world.

**PERFECTION. THE ONLY
STANDARD WE WORK TO.
PRODUCT OF AUSTRALIA.**

Nashua Discs Direct Sales Centres.

New South Wales: 48 Frenchs Road, Willoughby 2068. Phone: (02)958 2044. **Australian Capital Territory:** 71 Constitution Avenue, Campbell 2601. Phone: (062) 47 0511. **Victoria:** 523 Victoria Street, Abbotsford 3067. Phone: (03)428 0501. **Queensland:** 1 Mayneview Street, Milton 4064. Phone: (07) 369 4244. **South Australia:** 31 The Parade, Norwood 5067. Phone: (08) 42 0021. **Western Australia:** 131 Summers Street, East Perth 6000. Phone: (09) 328 1888. **Tasmania:** 209 Murray Street, Hobart 7000. Phone: (002) 23 4377. **Northern Territory:** 8 Gardiner Street, Darwin 5790. Phone: (089) 81 6204. **New Zealand:** Auckland. Phone: 39 2454. **Papua New Guinea:** Phone: 25 6766. **Fiji:** Phone: 25195.