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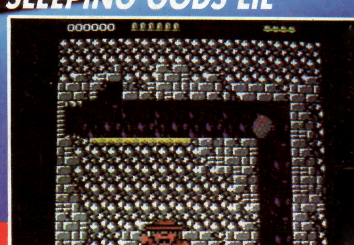

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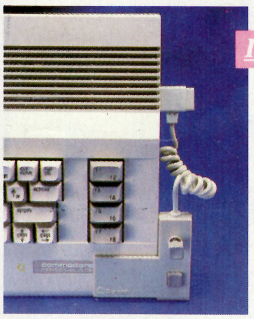

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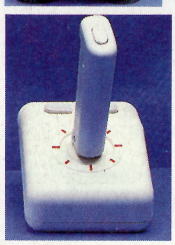

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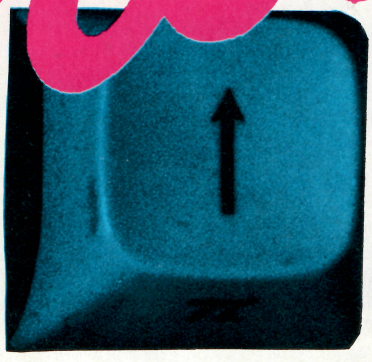

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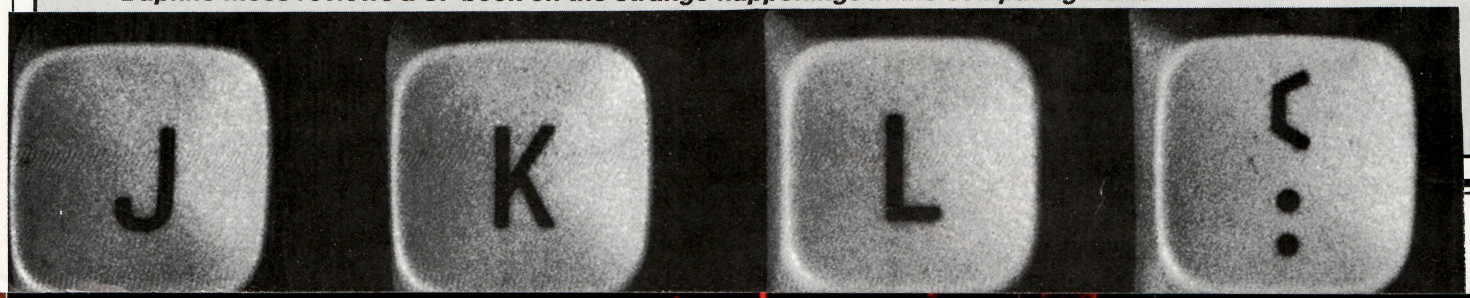

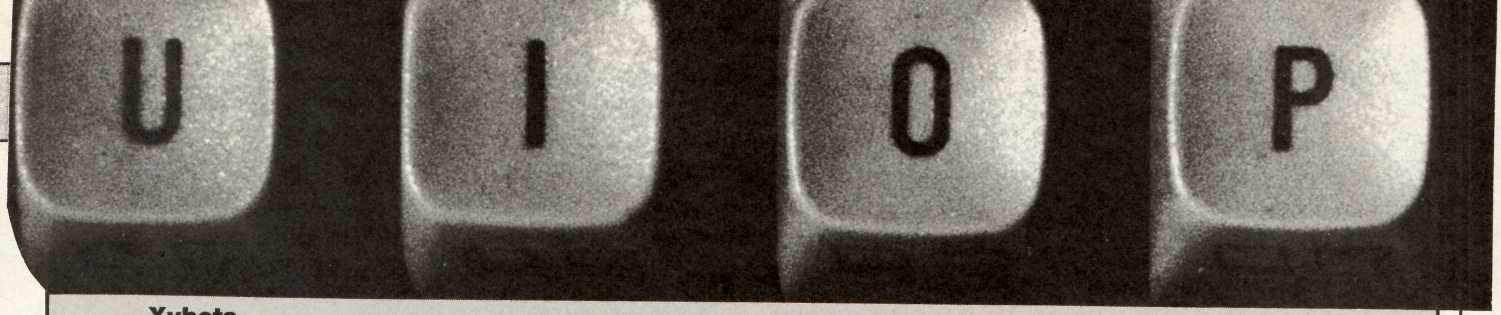

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CCI View

Dear CCI Reader,

A recent report has predicted that sales of home computers in the U.K., over the next five years, will remain virtually static. That means that about half a million home computers will be bought each year. So approximately one in every hundred people will purchase a machine. Does that sound like a lot? I suppose it depends which way you look at it. If that figure were the same throughout the world then some 50,000,000 home computers would be sold.

Now, I don't think that is going to happen, not for a long time. Thanks to Sir Clive Sinclair and his £50 ZX80, the U.K. is reputed to have more home computers per person than any other country, even the U.S.A. or Europe. The rest of the world is not so economically advanced as to be able to afford what is really easy for most people, even in the U.K., simply a luxury. Getting enough to eat and a roof over their heads is too grindingly difficult for more than two-thirds of the global population. For them a computer would be a cruel absurdity. In other countries such as South Africa or China, huge numbers are denied basic human rights and computers might not be what they need to change the harsh totalitarian regimes.

Yet such is the speed of economic change and technological progress that, even eliminating a very large part of the world's growing population, still leaves maybe a billion or more who could well afford to pay the relatively modest prices today asked for powerful and well-established computers such as the 64 or the Amiga. If they, on the U.K. proportion of 1 purchaser to 100 people, bought computers then there would be 10,000,000 new machines whirring away next year. But it is doubtful that global sales will reach even 2 million. So why is there such a large gap between what could — or should — happen and what probably will?

In the report I quoted, the main reason given for acquiring a home computer was said to be for "Educational" purposes. No, not at school or college but at home. Yet in this country, which as I said has the greatest number of home computers per person, sales of home educational software have been very poor even on the much-publicised BBC. On the C64 or the Spectrum, the biggest selling computers, they have been disastrous. For home computers have been bought either by what Americans call "Hobbyists", whose enthusiasm for the computer can reach fanatical levels or by gameplayers, even if they are young enough to have to persuade Dad and Mum to pay for computer "to help with the homework" when it is really for the latest shoot 'em up.

If that 8 million or so missing buyers were to be convinced, it would have to be for different reasons than enthuse the hobbyist or addict the gameplayer. The home computer would have to appeal as generally as the TV or the cassette player. It hasn't done that yet but why shouldn't it? When TV or home music making arrived they were the next step from the radio and the piano. Neither of which required high technical abilities, a factor which is important, perhaps vital in the widespread of innovation.

The mass audience, even greater in my estimate, than those 10,000,000 potential buyers won't be attracted until the uses for the home computer become more widely appealing, entertaining and stimulating.

In ***CCI***, we try to venture toward that aim by attempting to interest perhaps the broadest audience for a home computer publication. As in this issue of ***CCI***, we cover all the active Commodore machines. It is our view that the computer user, especailly the Commodore computer user, is not only hobbyist or gameplayer and that the material we include could be read with interest even by those who don't think it will be and in some cases by those who might not use computers at all!

Newspapers were once read by only a very small number, an elite who knew how to read. Now literacy has spread widely in the developed countries at least and so has the reading of newspapers to hugely increased numbers — even if not all newspapers are worthwhile reading.

Until computers and, I hope, computer magazines can reach that scale of audience, they will still hardly have exerted even a fraction of the influence on people and offered the power to people that the computer makes possible. When that happens, it may not be surprising to see as many computers sold as transistor radios are today. Now that would mean a whole new and exciting view for our computerised world, wouldn't it?

Antony Jacobson
Managing Editor and Publisher

COMMODORE COMPUTING INTERNATIONAL

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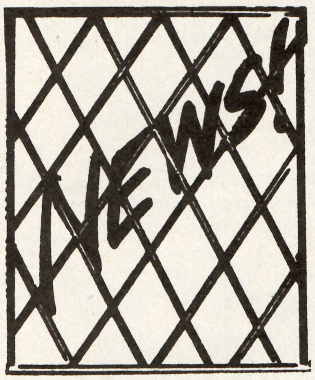

"Inovatronics Can Do"

Inovatronics, Inc. of Dallas, Texas have just announced the release of CanDo. With CanDo, any Amiga user can create complex interactive audio/visual presentations, games, and even complete applications. IFF full screen graphics, brushes, BrushANIMS and sampled sounds (as well as Intuition menus and gadgets) can now be practically utilized by users with no programming experience.

CanDo's graphic interface guides the user through the step-by-step process of designing his or her project via a series of simple to use menus and requesters. While doing this, it generates the software that the user designs. Gadgets and menus may be easily added to any window or graphic. A CanDo gadget, when clicked on, can execute a "script" of CanDo or AmigaDOS commands.

Price: $149.95 (US). Contact: Inovatronics 8499 Greenville Avenue, Suite 209B Dallas, Texas 75213. Tel: (214) 340-4991.

Low cost buffer

Computer industry pioneer Mills Associates announced today that it has acquired the exclusive rights to manufacture and market a printer buffering device which the company claims will give PC users a low cost, but dramatic, increase in throughput.

Designed by Mosaic Sysems of Diss, Norfolk, the device takes the form of a small box which is simply plugged in between a PC — any IBM or compatible — and its printer.

The Mosaic buffer will work in any parallel (Centronics) interface — Baker is working on a RS232 version — and comes with 64, 128 or 256K. UK end user prices are £129 for the 64k version; prices for the 128 and 256k versions are still being discussed. Contact: Mills Associates, Tel: (0600) 4611.

Citizen 24 pin printer

Citizen Europe have just added a new 24 pin machine called the Swift 24, to its range of 24 pin printers. The Swift 24 is particularly competitively priced at £389 (exc VAT). The new Swift 24 is intended to meet the needs of an increasingly sophisticated user-primarily small businesses, the education market and home computer users who need high quality output, reliability, low noise and high speeds — all at an exceptional price.

The Swift 24 is compatible with Epson LQ, IBM Proprinter and NEC emulations and prints at speeds of 192 cps in elite or 160 cps in pica pitch, and 53 cps in letter quality mode. The printer comes with Centronics-style parallel interface as standard, with the option of RS232C serial. An 8KB buffer is standard and is expandable to 40KB.

The Swift 24 has been developed in conjunction with British engineers and is manufactured at Citizen's Scunthorpe factory in South Humberside. The printer is available now from all good computer retailers or at any Citizen nationwide network of specialist SuperDealers. Contact: Customer Response Centre. Tel: (0895) 72621.



Canon Fax 80

Offered by Action at £595.00, including 24-month extended warranty and free installation, the Canon Fax 80 can transmit an A4 page in 18 seconds, and accepts up to five sheets for a single transmission.

Ideal for use where space is at a premium, it measures 280 × 250 × 92mm — smaller than the average portable typewriter — and weighs only about 5kg (11lbs). It is fitted with a handset that can be used as an ordinary telephone when the fax is not in use, and also provides a handy personal copying facility. Contact: Action Computer Supplies, Abercorn Commercial Centre, Manor Farm Road, Wembley, Middx, HA0 1WL. Tel: (0800) 333 333.

Quote of the Month

Ask a BIOS question, get a BIOS answer. From Glen Henry, ex IBM fellow, comes this quote of the month: "We don't want to do the whole BIOS ourselves. We presently get a base BIOS from Phoenix, then enhance, modify and fix it ourselves. The source code licence agreement to modify base source, add function to it, and use it on our products, is vital. We have the ability to add capability.

"As products get more sophisticated, go faster and have faster files they still have to carry the baggage of the past to be AT-compatible. It gets harder to do as sophistication increases, but it's critical for the customer." Say that again!!

300 DPI scanner

Gold Disk Inc. has developed a hardware/software interface for the Canon IX12, black and white, 300 dot-per-inch scanner. Available for Amiga desktop publishing or illustration, this scanner will allow the user to save images as black and white IFF files at 75, 150, 200 or 300 dots per inch. The image will be saved in approximately 15 seconds, claim.

Software control allows the user to define regions of scanned pages for high-resolution use. The scanned images can be used in any Amiga program supporting the IFF standard. This means you could colour your images in paint programs like Deluxe Paint II, or import your scanned pictures directly into your Professional Page layouts. Price: $1095.00 U.S.

Contact: Gold Disk P.O. Box 789, Streetsville, Mississauga, Ontario, Canada L5M 2C2. Tel: (416) 828 0913.

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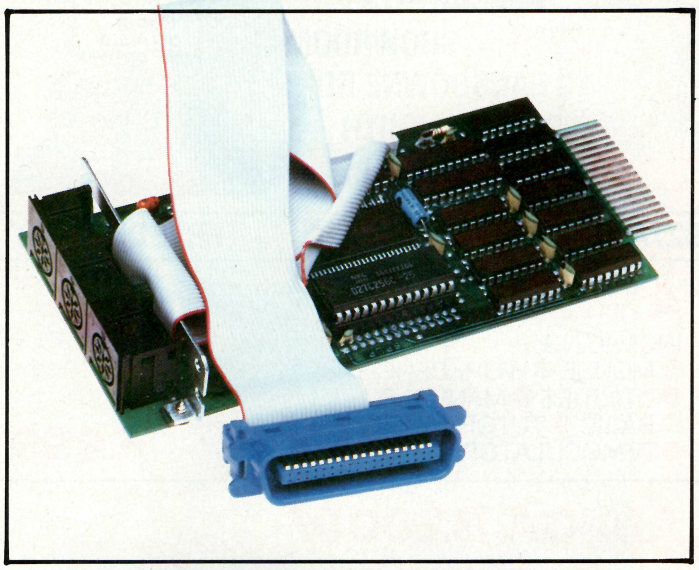

'SPEP' Up Your Printer

ACT has recently introduced the SPEP 3 and SPEP 5 spoolers, so that three or five PCs can use a single laser printer simultaneously — or any other type of printer with a parallel interface — over distances of up to 25m. The company say you can even use a single spooler to link five PCs to two printers.

The system does not require adaptor cards or software drivers. Instead, the spooler board plugs into the printer's alternative I/O socket and provides its own sockets for connecting to the parallel port on a PC by a cable.

The environment manager program also gives the user full control over printer features such as font selection, fixed or proportional spacing, page orientation, graphics resolution, line length, and number of copies. Contact: Rapid Winners, Rapid House, Oxford Road, High Wycombe, Buckinghamshire HP11 2EE. Tel: (0494) 26271.

Azlan deal

Azlan have announced that it has concluded an agreement with Eicon Technology Corporation. Under the terms of the contract, Azlan will become a reseller of Eicon products throughout the UK.

Based in Montreal, and established in 1984, Eicon produces advanced solutions for micro-to-mainframe, micro-to-mini and LAN-to-LAN communications.

The core of Eicon's gateway technology is the 'EiconCards', which are intelligent communications adapters for the IBM, PC, and PS/2. With its own microprocessor and memory, the EiconCard handles the intricacies of SDLC and X.25, freeing the host PC — and its memory — to perform tasks. Communications speeds are up to 128kps. UK end user prices for Eicon technology products will start at around £1,000. Contact: Azlan, Tel: (0734) 894400.

Omega Bulletin Board

"Omega" is the latest in a long line of Bulletin Boards to be released on to the phone lines. The "Omega" can offer a regular news service, reviews, a message service, as well as a program upload/download area. Contact Omega's, Tel: (0424) 217370; it is in modes V21 and 23. It operates between 8pm and 8am seven days a week.

Young Citizens Computing for a Greener World

On Wednesday 5th July, Citizen Europe awarded over £11,000 worth of computer equipment to the winners of the "Datachase" schools competition — an environmental project which aims to encourage the use of computer technology in schools. "Datachase" is a joint venture between the World Wide Fund for Nature (WWF) and Citizen Europe, whose sponsorship is worth £75,000.

Seventy children, representing the twenty winning schools from around the UK, gathered at London Zoo for a special Awards Ceremony hosted by Dominic Powlesland, director of Britain's largest archaeological dig — the Heslerton Parish Project. "Datachase" has three main objectives: to encourage young people to identify, investigate and learn about environmental issues; to help students develop presentation and creative skills through the use of computers and to demonstrate how problems can often be most successfully solved as a result of a collaborative effort.

First place winners in three different age categories (5-8 years, 9-14 years and 15-19 years) received a £2,000 computer equipment voucher and a Citizen 180E computer printer. There were six runners up in both the 5-8 and 9-4 years categories and three runners-up in the 15-19 years category; all of whom received a Citizen 180E computer printer prize. The two entries submitted in the special needs category were both commended for their projects, receiving a Citizen 180E prize. Contact: The Fitzroy Company. Tel: (01) 388 9871.

APS gains own label

The computer division of Philips, PTIS of Gravenhage, Netherlands, is now marketing Nighthawk Electronics' APS automatic printer switch under its own label. The deal with Philips is co-ordinated by Nighthawk's distributor for the Netherlands, WEMEX B.V. — Zeist. The APS switches are manufactured and labelled with the Philips name by Nighthawk in the UK. Contact: Nighthawk Electronics PO Box 44 Saffron Walden Essex CB11 3ND. Tel: (0799) 40881.

"Free kick" for CBM

Commodore Business Machines is pleased to announce its association with FREE KICK, a new weekly football magazine. The title will be distributed free each week to 326 football grounds in England, Scotland and Wales, with an initial circulation of 80,000.

The magazine combines new articles on individual clubs and current issues with profiles, humour, listings, competitions and team posters. Commodore is sponsoring the weekly ranking section in the magazine — the Commodore Computer Rankings. All available data on a player's performance, taken from various sources, is carefully analysed to produce a National Football Ranking table for the UK's top players. Chart positions are dependent upon the player's successes (or failures) throughout the season.

Contact: Spire Public Relations, 6/7 Hazlitt Mews, London W14 0JZ.

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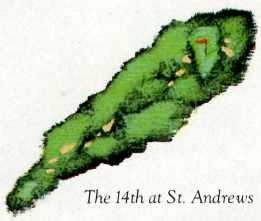


The 14th at St. Andrews



The 10th at Riviera



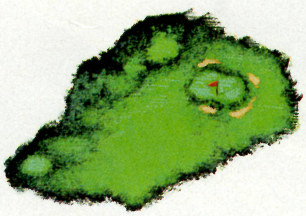
The 4th at Baltusrol



The 13th at Augusta



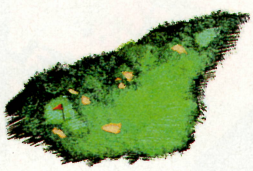
The 18th at Muirfield



The 7th at Pebble Beach



The 18th at Oakmont



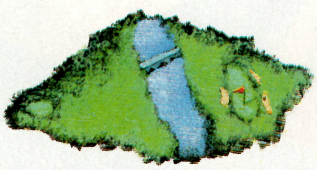
The 12th at St. Andrews



The 10th at Augusta



The 11th at Merion



The 12th at Augusta



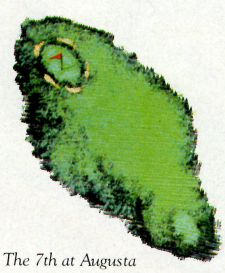
The 18th at Riviera



The 17th at Baltusrol



The 12th at Royal Lytham



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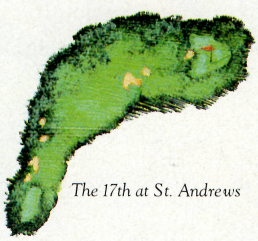

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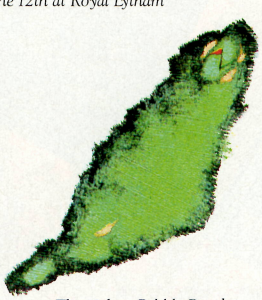
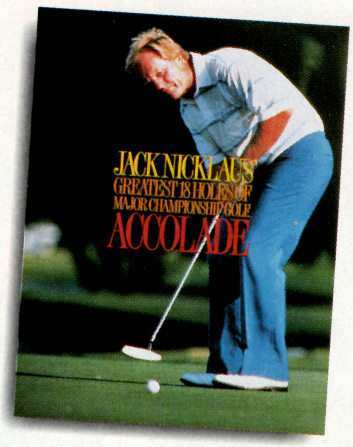


The 18th at Pebble Beach



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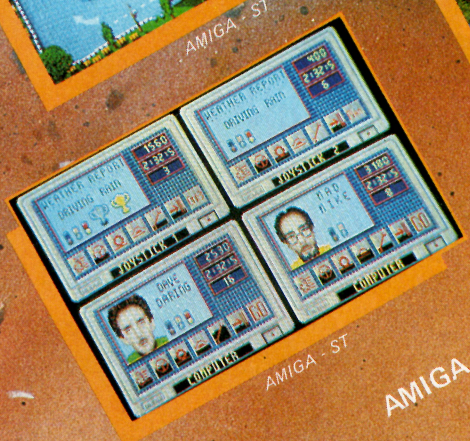
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AbleOffice

AbleOffice, a modular work station which is essentially an entire system applicable to almost all mobility-impaired individuals, has being introduced at the annual meeting of the President's Committee in Tampa, Florida (USA).

Developed by the Center for Rehabilitation Technology of Georgia Tech, AbleOffice solves many of the problems which the mobility impaired have in managing files, space books, and other materials used in office work. Its 14 interchangeable components can be assembled in dozens of ways to suit individual needs, and components, in different configurations, have been successfully field tested by persons with quadriplegia, celebral palsy, head injuries, and similar conditions, the Presidents Committee on Employment of People with Disabilities reports.

The new system was originally created for Larry Howard, who, at 16, injured his spinal cord in a diving accident which left him a high-level paraplegic. Determined not to live as a useless invalid, Howard took correspondence courses in accounting, tax preparation, and bookkeeping. Through the Georgia Computer Campus, a government-funded school which evolved from an idea of Goodwill Industries of America, he learned computer programming and took a job in the field. Still, there were difficulties in managing materials and CRT took on the assignment.

With the combined skills of industrial design, electrical engineering, and industrial engineering, much planning and several years of experimentation, the Center came up with a modular work station, including even a telephone station. Howard's production increased by 25% within two weeks after he began working with the system.

Now, named AbleOffice, the modular system is being made available as a whole or in parts, and, according to present plans, will be available on a production basis.

AbleOffice modules are designed to make the best of whatever abilities a person has left in the areas of motion, strength, and dexterity. This modularity permits configurations which can be customized in three different levels of automation: *manual*, where the user has some finger and hand dexterity; *automated assistance*, where the user has poor upper body strength and needs automated aid; and *robotic assistance*, where the user has no voluntary movement.

The 14 components include capabilities which enable mobility-impaired workers almost to match the abilities of the unimpaired office worker. Materials used are lightweight, notably polystyrene, acrylic, aluminium, and wood composite.

The AbleOffice workstation has too many features to list here. Among the many practical everyday uses, it also has a *robot arm and track* which gives those who have virtually no mobiity an opportunity to work in an office environment. It is interesting to note that Georgia Tech was the first to install a robotic work station in a working office for everyday use. The arm has a seven-degree range of motion and can lift up to eight pounds. It is restricted in range for the protection of the user or users (the arm can be mounted to serve a cluster arrangement of work stations at one side). The control box is hidden, with all motors and moving parts made inaccessible (to avoid harming the user) and software designed to ignore invalid comments.

Using AbleOffice, a new direction has been given to the mobility impaired. Moreover, it is only one of the devices which have been developed by the Center for Rehabilitation Technology, which welcomes requests and ideas now that technology is making possible rewarding lives for the disabled, notably the mobility impaired. Contact: The President's Committee on Employment of People With Disabilities, Suite 636, 1111 20th Street, N.W., Washington, D.C. 20036-3470. Tel: (202) 653-5044.

EPSON 24-PIN COLOUR PRINTERS

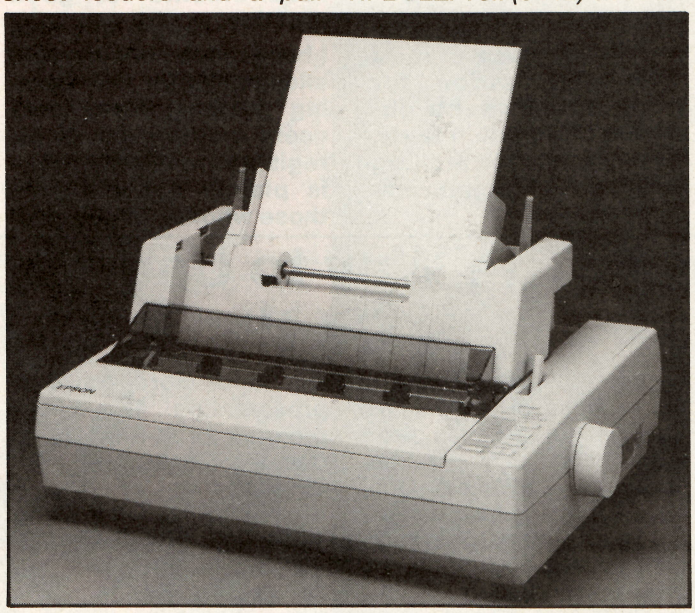
Professional 7-colour printing of letter quality text and graphics can be achieved on paper up to A3 in size with the latest, 24-pin, colour dedicated dot matrix printers from Epson, the 80-column LQ860 and 132-column LQ1060.

Marketed to needs such as business graphics and the professional enhancement of presentations such as reports and OHPs, both models are equipped with advanced Epson paper management enabling cut sheets and continuous paper to be handled automatically.

The standard 4-colour ribbon (it includes black but there is the option of a black film ribbon) gives up to 7 colorus with secondary shades, and there are 11 graphics modes.

The Epson LQ860 is 469mm wide, 399mm deep, 194mm high and is priced at £769. The LQ1060 is 609mm wide, 399mm deep, 194mm high and is priced at £959.

Single and double bin cut sheet feeders and a pull feed tractor are available as options. There is also an optional roll holder for the LQ860. Contact: Epson (UK) Ltd., Campus 100, Maylands Avenue, Hemel Hempstead, Hertfordshire HP2 7EZ. Tel: (0442) 61144.



Domestic success for Japan

According to the second Yearbook of World Electronics, *Japan's output for 1989 is forecast at $55 billion, only $2 billion below the output of the United States. In 1986, Japan's computer production was only two-thirds of that of the US and only one-tenth in 1976, the Yearbook shows.*

In the European Community in the same year, European output equalled Japan at $30 billion. In 1989, it is expected to be only 85% of Japan's total output.

...news...news...news...news

Maintenance Free

Commodore Business Machines (UK) Ltd has announced that all its PCs sold from now on will carry one year free maintenance. Each PC shipped will include a pre-paid card which the customer completes and sends to Commodore's third-party maintenance company, Granada Computer Services (GCS), within 30 days of purchase. The machine is then covered for one year's free on-site maintenance.

The scheme covers repairs for the basic system, and a straight exchange for faulty monitors or printers. Maintenance for all Commodore PCs and PC bundle configurations are covered, with the exclusion of the Amiga range and additonal non-Commodore kit. Details of special monitors, additonal cards, laser printers etc, are included on the reply-paid card in a separate section. Maintenance for these extras is covered through a charge under a separate agreement.

GCS engineers operate from 44 centres in the UK. If a fault develops, the end-user contacts Call Control, which reports the fault to the engineers, who make a preliminary diagnosis from the available information. Replacement parts are anticipated by the engineers, and are shipped by courier to the customer. The engineer then arrives to carry out any repairs necessary.



Ranger Z88

A battery-operated, 3½-inch IBM PC-compatible flexible disk drive for the Cambridge Computer Z88 portable microcomputer has been developed by Ranger Computers.

Known as RangerDisk, the new product allows Z88 uses to use 720kbyte floppy disks as both a storage medium and for exchanging files with IBM-PC compatibles, IBM PS/2 and Apple Macintosh IIe computers.

RangerDisk is a self-contained unit with a robust aluminium housing. It operates from six 'AA' alkaline cells or an optional AC adaptor, and is suitable for portable, home or office use. RangerDisk costs £450 (plus VAT). Optional accessories include a mains adaptor and a woven nylon carrying case. Ranger also plan to introduce future versions of RangerDisk for use with a variety of other battery portable computers. Contact: Ranger Computers Limited, The Innovation Centre, Boughton Green Road, Moulton Park, Northampton, NN2 7AH.

Data protection

In his Annual Report to Parl ament just published the Data Protection Registrar, Mr Eric Howe, states that date protection issues are arising increasingly frequently and in wider and wider contexts. Complaints from the public, too, are increasing. He has now taken the first formal enforcement actions against data users. He cites a number of areas where significant data protection issues have arisen in the course of the year. These include: Community Charge Registers; The Football Spectators Bill; computer 'hacking' and the law; use of third party information for credit assessment; obtaining information fairly, for example for mailing lists; and driver information systems.

A sign that the public are becoming increasingly aware of the implications of the Data Protection Act is the rise in complaints received by the Registrar. The total number for the year ended 31 May was 1122. This compares with 836 complaints in the previous twelve month period.

Speaking in London today, Mr Howe said, "Data users have now had more than four years to become familiar with the provisions of the Act and the requirements for good practice. During this time I have made considerable allowances for the learning process. Many data users are now due to re-register and a gentle line is plainly not right for those who fail to do so."

Scanlab Software

ASDG Incorporated has released version 1.1 of Scanlab, the utility software that accompanies its Professional ScanLab package for the Commodore-Amiga 2000 and 2500 personal computers.

The company claim Professional ScanLab's utility software now has improved 24-bit electronic colour separation routines that yield truer colours than previously possible when used to prepare films for professional quality offset printing.

ASDG tell us Magenta ink, for example, is not 100% magenta. It actually has small amounts of cyan mixed in.

Professional ScanLab version 1.1 makes allowance for such impurities and yields electronic colour separations that are superior to those previously possible.

Priced at $995.00 (US), ASDG's Professional ScanLab is an advanced hardware-software combination for the Amiga 2000 or 2500 personal computer that lets users connect to and control the JX-300 and JX-450 24-bit colour desktop scanners, manufactured by SHARP Electronics Corporation of Mahwah, New Jersey, USA.

The Way to Use XCad!

Spring 1989 marked the first release of X-Shell. X-Shell is not a single program, but, as its name implies, it is a "shell". One purpose of a software shell is to surround a target program and replace its user interface with another, easier and more powerful presentation. The target program of X-Shell is X-Cad. Price $199 (US).

Contact:

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U.K. Home Computer Statistics

Britain has the highest number of personal home computers incomparison to other European nations according to Mintel's *European Lifestyles* 1989 report. Approximately 23% of UK households own a computer, comparing to Holland (17%), Italy (14%), Germany (13%), Spain (13%), Belgium (10%) and France (7%).

Go Forth!

Andy Eskelson reviews two Forth books and provides some useful information for aspiring programmers.

Forth is one of the most unusual computer languages available today. Almost all other computer languages were produced to be used as a programming system, some were not even intended for writing serious programs (ie Pascal and Basic), they were intended for

"The results were so powerful, that he decided that it was a forth generation language."

teaching purposes only. Forth is doubly unusual in that it is the only common example of a Threaded Interpretive Language.

History

The most unusual aspect of Forth is that it was created by one man, Charles H. Moore, in response to a particular practical problem. That was the control of radio telescopes, the computers in use at the time were IBM 1130, a third generation computer system. The languages in use at the time were not providing the facilities that Mr Moore needed so he produced his own language. The results were so powerful, that he decided that it was a fourth generation language. However the IBM 1130 computers only allowed a five character file identifier hence the name FORTH was used.

In many aspects Forth is very easy to use and learn, but you must throw just about every pre-conceived concept of Basic out of the window. Forth makes the programmer do some of the hard work, in that you have to think about the structure of your program before you start to code it. It is impossible to write unstructured programs in Forth, but it is possible to write totally unreadable programs. It is up to the programmer to identify and comment his own code to a suitable level.

Background

Forth has a set of instructions called WORDS and there is a common core of words that are defined in the Forth standard. The original was the 79 standard, and now it is the 83 standard. The uniqueness of the language comes in the way that you can extend it to meet any specific applications that you want.

When you write a Forth program, you are really extending the language by adding new words to the core, (the dictionary) You can think of a word as a subroutine in any other language, but it is not quite the same. If you needed to print on the screen the words 'FRED BLOGGS' a few times you could write a word to do this....

: FREDB 10 0 DO .' FRED BLOGGS ' LOOP ;

the colon : tells the Forth system that you are adding a new word. FREDB is the name that you are giving to the new word. Next comes the actual definition of what the word is going to do. Lastly to tell the Forth system that you have finished the definition you put a semicolon ; at the end. If I rewrite this code in a slightly different way it will look a lot better and you will see what it does.

```
: FREDB
10 0
DO ."FRED BLOGGS" LOOP;
```

This format is perfectly acceptable to use and makes the code much easier to read. What you have is a very standard DO LOOP with some code imbedded in the middle of it. .' is a Forth WORD it means print. Next you enter the text to print, in this case FRED BLOGGS and finish the text with a single double quote ' very simple so far.

If you used Basic you would write a line something like..

FOR A = 1 TO 10 : PRINT "FRED BLOGGS" : NEXT

Look at the difference in the numbers , Forth demands them in reverse order compared to Basic. This is the very unusual feature of Forth.. its stack.

"This opens up a very powerful and flexible system in the example FREDB we defined the number of times that the text would be printed."

All numbers are passed to Forth on a stack, and you perform calculations in reverse polish. If you use the HP range of calculators you will understand this system very easily. It works like this, if you want to add 2 and 3 normally you would enter into a claculator 2 + 3 = and get the answer. In Forth and on HP calculators you enter 2 3 + and the answer will be on the top of the stack if you want to display this answer in Forth you simply type a full stop . and the top number on the stack will be printed on the screen.

This opens up a very powerful and flexible system in the example FREDB we defined the number of times that the text would be printed. If we modify the word slightly like this..

: FREDB 0 DO . 'FRED BLOGGS' LOOP ;

We can now specify how many times the text will be printed, this is done by pushing a number onto the stack first. Numbers are automatically pushed onto the stack when you type them in. so to print the text 10 times (the same as the original exam-

continued on page 16

continued from page 15

ple) you simply enter..

10 FREDB

and press return. you can type 100 FREDB, or 1 FREDB and so on. The problem is that you will have to document into the program what you expect to have on the stack, this is where Forth can be unreadable so take care to comment your code!

Lastly, you can make words up to do anything that you require, if you hate some of the Forth words write your own.....

: PRINT ." ;
: FREDB 0 DO PRINT FRED BLOGGS " LOOP ;

see what I mean??

Now that you have an idea about Forth, you will probably want to know more about it, there are a few books on the market aimed at the beginner here is a look at a couple of them.

'Starting Forth'

'Starting Forth' by Leo Brodie (Prentice-Hall £20.00)

This is one of the early bibles on Forth, originally produced for the Forth 79 standard, later editions cover the 83 standard as well.

This is an American book and it certainly shows. Leo Brodie has a unique style, and makes use of lots of little cartoons and sketches to help get the point across. This seems a very strange method especially when experienced programmers are reading the book, but do not knock it too much because the system works!

The book consists of over 300 pages (1st edition) and covers all of the expected areas in 12 chapters.

Chapter 1. Fundamental Forth, explains the concepts of Forth and what the stack is all about. Even in this first chapter, there is a review of the terms and a few questions for you to answer, just to make sure that you have understood the chapter.

Chapter 2 covers Forths number systems and the stack operations. Forth normally lacks floating point numbering systems and this is pointed out at this stage when the division operators are discussed. Chapter 3 Is an in depth look at the standard Forth editor. This was a common editor and is still in use today, but many later Forth implementations make use of their own editor. However you will find that many program examples are written using the standard editor (itself a Forth program) so it is worth the effort of learning a bit about the system. Chapter 4 covers the conditional operators, and the IF THEN ELSE construct. Chapter 5 discusses the fixed point number system and describes the various techniques for dealing with numbers without full floating point capability. Chapter 6 Is very simple, but it is very important in any language, and that is the LOOP operators, DO..LOOP and BEGIN..UNTIL and the various differences between them are discussed. Chapter 7 describes the different types of numbers and the maximum values that each type can hold. Some examples are Double-Length, signed and unsigned, arithmetic shifting etc. Chapter 8 is all about arrays and variables, and how to get the best out of them. Chapter 9 is a slightly deeper look at the inner workings of Forth, and some of the more unusual aspects of the language. Chapter 10 covers I/O processing, and how to make use of files both for program and data storage. Chapter 11 is a look at the methods that can be used to extend the language and also a look at flowcharting. Chapter 12 consists of three examples that illustrate some of the things covered in the book.

"This is a very good book, and it is able to give even the complete beginner a good understanding of the Forth language."

There are four appendices that cover the answers to the problems, features of Polyforth the Forth 79 standard and a summary of Forth words.

This is a very good book, and it is able to give even the complete beginner a good understanding of the Forth language.

'A Complete Course ...'

'FORTH A Complete Course in the Forth Programming Language,' by P.A.C. Kail, (Kogan-Page, £15.00)

This book is an English publication and as such it has a much more orthodox layout and approach. It claims to be a complete course, and it does seem to cover the Forth language. However it is not possible to cover the entire Forth language in 190 odd pages, the subject is far too big for that. What is covered is more than enough for the beginner to get to grips with, and if the book is worked through the reader will be capable of writing Forth programs that will work. The reader will also have enough knowledge to progress to much more advanced programming in Forth.

The presentation of the book as I have said is much more orthodox, but it is not at all stuffy and hard to read. There are some nice sketches and lots of other diagrams that help the reader understand the various aspects of the language.

The book is divided into 11 chapters that cover:

Chapter 1 this describes the various fundamental aspects of Forth, how to create new words and what the stack is all about. There are also exercises at the end of each chapter for you to complete. Chapter 2 covers the operation of the Forth stack in some depth, along with all the operations that you can perform on the stack. Chapter 3 discusses how to define new Forth words, commenting your programs, and general dictionary management and Chapter 4 describes constants and variables and the differences between them. Memory storage and arrays are also covered in this chapter. Chapter 5 covers the logical operators that are available in Forth IF THEN ELSE Flags, and the normal set of boolean operators are all covered. And Chapter 6 covers the loop constructions that Forth has, DO LOOP and BEGIN UNTIL and the various options that you are able to use with the loops.

Chapter 7 Covers the various number systems that Forth uses, whilst Chapter 8 is a more advanced look at word definitions and vocabularies, also covered here is a look at the compilation process and how you can use it in your programs.

Chapter 9 is all about the storage of files, in essence it is about the use and operation of the Forth editor.

Chapter 10 is one of the more complex chapters and covers I/O and moving things about in memory. And Chapter 11 is a very general chapter that cites the pros and cons of Forth, and a how Forth works Improvements, History and a few examples of Forth in real use are also covered.

If you compare the two books, they generally do the same job. I did find one very noticeable difference between the two books and that was the speed with which they take you through the Forth language. Brodie uses a very leisurely and slow pace which leads the reader very carefully through each command. Kail on the other hand is very much sharper in his approach, and this is reflected in the fewer pages in the book. Neither approach is wrong, and it is more of a matter of personal preference. I think that the Kail book is better suited to the type of user that has a rough idea of what Forth is all about, and Brodies book is better for the user that is totally confused about Forth.

A.E.

For information about Forth contact the Forth Interest Group UK. Membership is £10, p.a. Contact: the Membership Secretary, Colin Walls, 88 Woosehill Lane, Wokingham, Berks. RG11 2TS.

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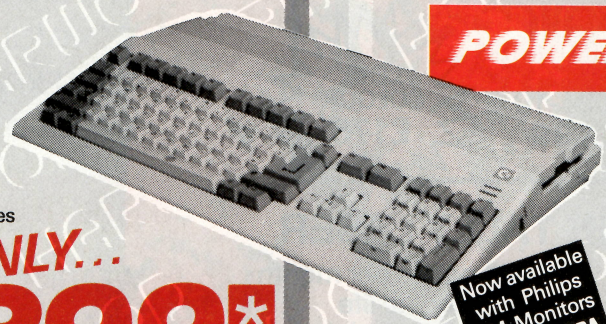

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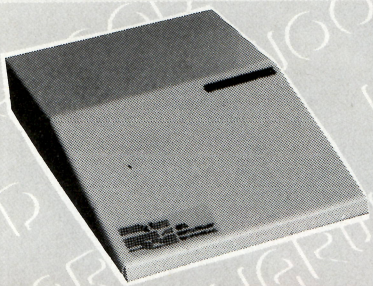

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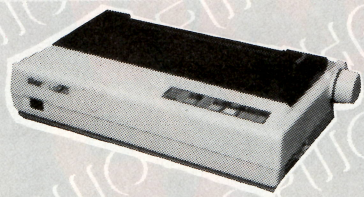

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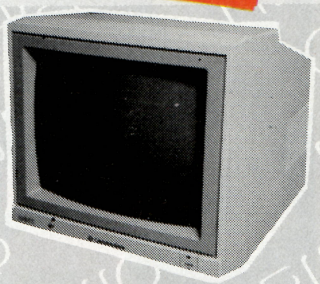

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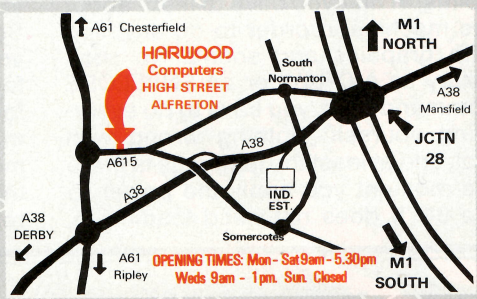

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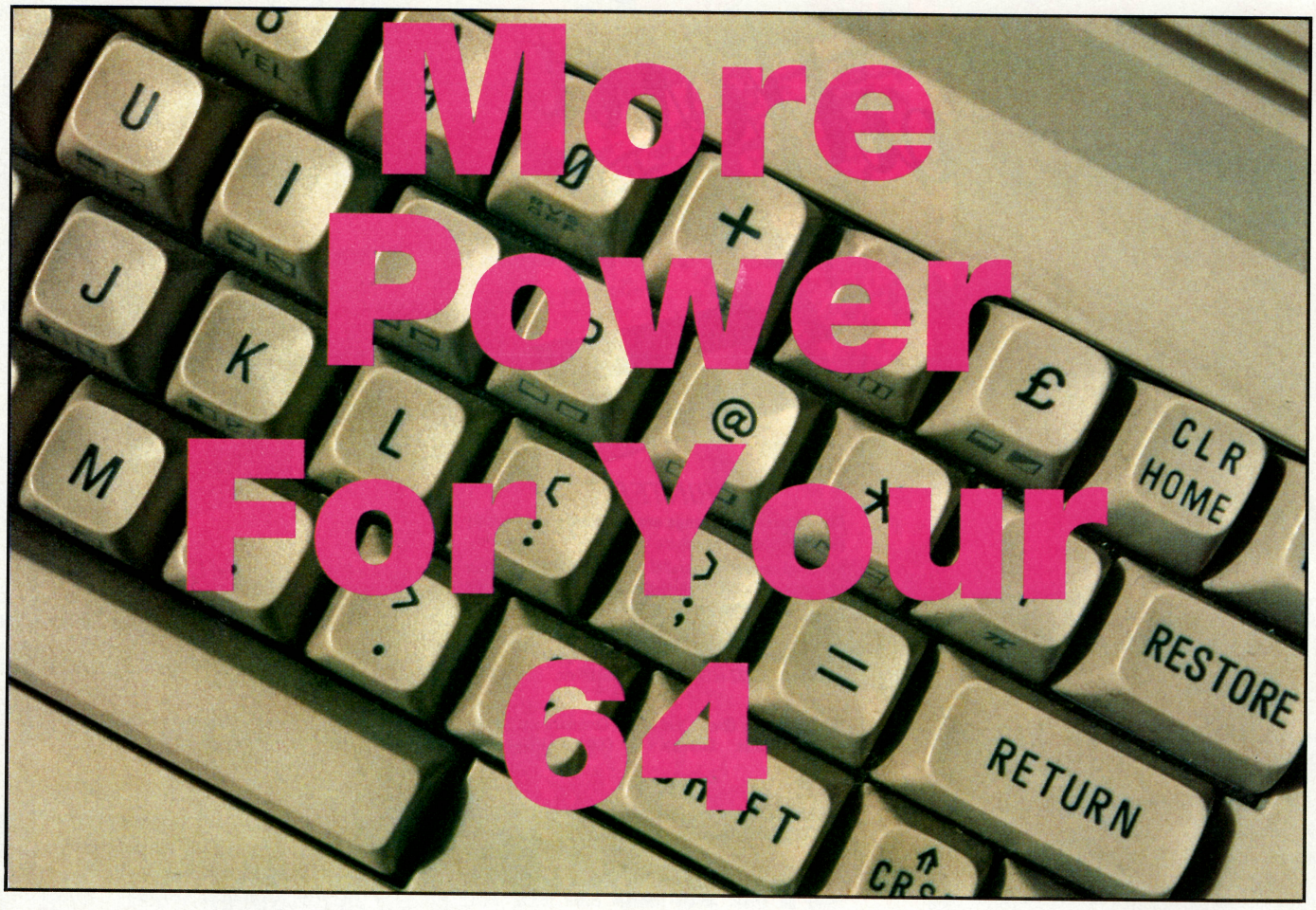

More Power For Your 64

Learning new languanges is inherent to the art of programming, says Peter Gerrard. You, too, can speak with 'a thousand tongues ...'

There has been much talk in the press and on television this year concerning the impending arrival of 1992 and our greater trading powers with Europe. We must, they all say, learn to speak 12 different languages at least if we are going to be able to compete with our European neighbours. If we don't, everyone seems to insist, we will be left far behind in the European community and will end up on the economic scrapheap. Moi? Je suis un computer person. We computer people have been learning different languages for years, and a French programmer would probably have no great difficulty in communicating with a British counterpart. Load that accumulator, domension that array, it's all the same. I mentioned 12 different languages just now, and by a spooky coincidence that is precisely the number that we will be looking at this month as we have a gentle stroll down language lane and see just what there is available to us, good, bad, or merely indifferent.

Of course, as soon as you turn on the 64 you are into the world of Commodore Basic, and I am afraid this does have to come under the classification of indifferent. It is not bad, and I have certainly used far worse versions of the Basic language, but I have also used far better. I have definitely used quicker ones, and even bearing in mind that the 64 version was developed many moons ago I was astonished recently when writing a program in STOS (an Atari ST sort of Basic) to find the STOS version running at lightning speed in comparison with the 64 one. Virtually the same coding, but a frightening difference in speed.

The 64 Basic does have its good points, in that you have to learn about the machine in order to do anything with graphics and sound. No such luxury as a DRAW or an ENVELOPE command here, you have to do everything yourself. Nothing wrong with that, and at least the language is there the moment you apply the power to the 64. It does not need loading in, and it can be switched out, and it is standard from one 64 to another all over the world.

Basic Extensions

What is not standard are the many extensions to Basic that are available, Simon's Basic, that sort of thing, where several hundred commands are added to the existing command set. No bad things in themselves, but they reduce your programs to the level where they can only run on other 64s that hae the same extension to

```
BASIC
10 PRINT CHR$(147)
20 FOR I=0 TO 9
30 PRINT I
40 NEXT I
```

Basic. If they will run without the extension then there was no point in you buying the thing in the first place. So, Basic add-ons are all very well if you want to write programs that very few other people can use. A big plus for them, though, is that they can make your own program development that much easier if you stick to things like renumbering, find and replace, and so on. Backwards scroll-

ing of a listing is quite handy as well.

The same point about programs only running on a few machines, incidentally, might be made of other languages. However, most of them do allow you to produce stand-alone versions that will run on any 64 without the need for all other 64 owners to race out and buy a copy of Pascal, or whatever.

Universal Applications

If you stick to our second language, machine code, you get the benefits of universal running power and a great improvement in speed. In a sense machine code, just like Basic, is there as soon as you turn the computer on, but programming blind like that would be a very difficult thing to do, and you would soon give up in despair. It is better to buy one of the

```
MACHINE CODE
C000 LDX #$09
C002 TXA
C003 STA $0400,X
C006 DEX
C007 CPX #$00
C009 BNE $C002
C00C RTS
```

many assemblers, monitors, disassemblers, that are on the market. A little thing called Extramon seems to have leapt into the public domain, and it's a good enough place to start.

Slightly higher up the list something called XMON, which appers to exist in several different versions, each occupying different parts of the computer's memory depending on your needs at the time. Most good assemblers can be relocated in this way, as it is called, or even just shunted from one part of memory to another, to make slightly less use of computer jargon.

Learning machine code from scratch is not easy, and takes time and patience. Patience, probably, is the greatest of virtues for all machine code programmers. You are a programming away within the assembler, you save the latest version and run it, and the machine locks up. Switch off and on, re-load the assembler, re-load your program, make a slight change and try again, and you get the same results. Go through the whole process one more time and discover that you can not quite remember what the slight change was. Was it (a) or (b)? Try (a). Ah, machine hangs up in exactly the same way, that is what I must have done last time, I will try (b) next time. Meanwhile, where's the coffee?

This is a familiar enough scenario to most readers/programmers, I should imagine (especially the coffee part!). But I can still remember the joy of getting my first proper machine code program to work, and to work at a speed that left Basic for dead. I was away, then, machine coding all over the place, discovering interrupts and the joys of using them, having three different interrupt-driven activities all happening at virtually the same time — wonderful stuff! you could never do it in Basic, and the hours, weeks and years that it takes to really get the hang of machine code will all be worth it in the end, especially as everything seems so unfriendly to begin with. Load the accumulator with 65? Why? Persevere, there are many good books on the subject, and if you're not a machine code person yet then when you become one it will be like buying a new computer. So many new things to do!

CP/M

Talking about things being unfriendly, our third language is probably as unfriendly as any when you first see it. CP/M is what most people seem to think stands for Confuses People Most, an accurate enough description. However, it really stands for Control Program for Microcomputers, and was originally designed in the early 1970s by an American chappie called Gary Kildall. Apparently he had a hard time selling it to begin with, but to help things along he started giving utilities away as well, and sales soon began to take off. That was shortly before they went through the roof, and CP/M as an operating system became the most popular in the universe. Now it is not so popular; but there are still plenty of them about, and literally thousands of programs have been written in this language, if not tens of thousands. According to Digital Research, which owns CP/M, they have sold over 20 million units, which cannot be bad. Just think of the royalties and drool!

The advantage of using CP/M is that so many other people over the years have also used it, and as a result there are a vast number of programs available that enable you to do virtually anything. Whether or not they will run on your computer straight away is another matter, but they might be able to be adapted, as has been the case with many 128 CP/M programs. Things like PIP (Peripheral Interchange Program), for instance, which has been around since the days when Mr. Kildall first started selling this disk-based operating system. You can try programming with it yourself, if you want, but I prefer to be extremely lazy and use the fruits of someone else's labour. It is a lot easier.

Pascal and Modula 2

Our next two languages were both originally designed by the same person, and in turn they were both designed to be better versions of a language that we shall be coming to a little later on. Niklaus Wirth is the designer's name, and to some people he is the closest thing to God on this planet. I have never met the man, but I have met people who worship him from afar, and the end result of talking to them is something similar to the effort you might make in trying to convince a younger acquaintance that Bob Dylan was once a really great singer/songwriter. An interesting phenomena.

Anyway, ours is not to reason why, ours is to look at languages. So, whether or not the "Niklaus Wirth is God" campaign has any truth in it (they used to say that about Eric Clapton once), his languages are certainly here for us to examine. Pascal is the first one of the two, named after a seventeenth century French philosopher/mathematician called Blaise Pascal. Contributed to the development of Calculus, apparently, did old Blaise. Swine!

```
PASCAL
REPEAT
SWAPPED:=FALSE;
FOR I:=1 TO N-1 DO
IF X[I]>X[I+1] THEN SWAP(X[I],X[I+1],SWAPPED)
UNTIL NOT(SWAPPED)
```

Pascal is a very highly structured language, and listings of Pascal programs tend to look good. They have an air of destinction about them, if only because they're not in nice straight lines like Basic but move in and out to emphasise various parts of the code. Most people can make the move from Basic to Pascal very easily (they have a common father, Algol, which was designed by ... Niklaus Worth), and find it a very sensible language to deal with. If you're at all interested in playing about with

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strings and producing upper-class programs, Pascal is your man.

Modula 2, and no I don't know what happened to Modula 1, was intended to replace Pascal, and is even more structured than that original language. A language for purists, who love it. They probably try to write programs in BBC Basic at home and translate them into Modula 2 at work, becoming more structured than the Eiffel Tower. None of this GOTO and GOSUB nonense for Niklaus Worth.

Fortran, Algol and Cobolt

Our next two languages will be lumped together for not better reason than that they begin with the smae letter. Fortran was the very first computer language that I ever learnt, and if I tell you that Fortran is short for Formula Translation then you should get a good idea of what it is all about.

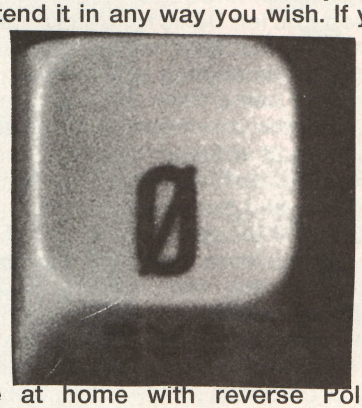
```
FORTRAN
      DO 200 I=0,9
        WRITE (6,300)I
200 CONTINUE
300 FORMAT (1X,I3)
```

In the early days of computing massive mainframe machines were designed with one end poind: they were going to crunch numbers like they had never been crunched before. Fortran is the language for doing this. In many ways it has similarities with Basic (the original Colossal Cave is supposed to have been written in Fortran, although heaven knows how), and someone with a Basic background would soon be sailing along with Fortran. It has loops like FOR ... NEXT, you can jump off to different parts of programs if you want, and if you ever want to know what commercial computer programming in huge offices is all about, then Fortran is the language for you. I



noticed the April 1989 ***CCI*** had at least one advertisement for a version of it. It is a powerful, standard language, that has stood the test of time well.

Forth is our seventh language (shades of East Fife 4 Forfar 5), and it is a fun one to play with. They tell me that it was originally designed to control radio telescopes, but percious few of those are ever linked up to a 64. The language has a little dictionary of words that it can understand, and the fun part is that you can build on that dictionary and extend it in any way you wish. If you



are at home with reverse Polish arrithmetic, you'll be all right with Forth. Of all the different languages available for the 64, Forth (after Basic and machine code, since they're standard) is to my mind the best one to experiment with next. Once mastered, you will never want to bother with anything else. Unfortunately, the needs of the world are such that you will have to program in other languages, but Forth is definitely, to use a computer word, a goodie.

We have kept mentioning Algol, since it is one of the daddies of them all, and it takes its name from Algorithmic Language, it seems. One of the advantages of Algol over its offspring Basic is its powers of recursion, a programming technique that can be handled after a fashion in Basic but which is totally at home in Algol. Listings look interested and make their authors look highly intelligent, but that is just the nature of Algol.

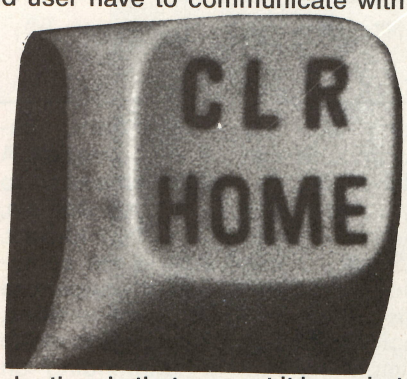
Cobol is our ninth language, and I notices and advertisement for a 128 version of it in the May 1989 issue of ***CCI***, so there is presumably a 64 version of it out there somewhere. Cobol stands for Common Businses Oriented Language, and is similar in its results to Fortran. Given vast amounts of data it processes it in a very simple and straightforward way. However, it is one of the languages that French (for example) programmers might initially have trouble with, since a Cobol listing looks almost as if it were written in plain English. This makes it fairly easy to learn, but its home is really the mainframe.

Logo, Lisp and Pilot

Logo and its turtle graphics can be fun initially, but do not expect to achieve great things with it. Simple educational programs for the kids are all very well, and in a good version it can be entertaining to watch little turtles trundling dementedly around the screen, but that is about as far as it goes. As you might have guessed by now, this is not Peter's favourite language, but you might find it of interest.

Lisp is not named after someone with a speech impediment, it is actually short for List Processor. This is because it treats everything as though it were a great list. Show it a collection of data, and it will make a list out of it. Lisp's greatest contribution to the world seems to be in the development of artificial intelligence programs, but they can be written in any one of several different languages, and so Lisp has no outstanding merit in that respect.

Finally, language number twelve is a thing called Pilot, and I have not the faintest idea what it stands for. I do know that its main home is the educational field, and I have spent quite some time programming in a find 64 version which makes allowance for such 64-like things as sprites and sounds. Everything seems to be in frames of text (with 64 additions, of course), which make it excellent for creating programs where computer and user have to communicate with



each other. In that respect it has what we might term a good parser, and in the hands of a competent programmer you could expect to see some very good material written in Pilot. Use the special 64 extensions and you just might get something excellent.

That brings us to the end of our quick trip among the languages, designed to suit all tastes and needs. Not all of them work that well on the 64, it must be said, and if I had to pick six out the 12 that are worth further investigation I would have to start with Basic and machine code (of course), followed by Pilot, Forth, Pascal and Fortran. That is not in any great order, by the way.

The one advantage of using a new language is, as I said earlier, like getting a whole new computer. More power to your elbow! And your 64 ...

P.G.

The Expert V4

Andy Eskelson reviews a handy cartridge that will save you 'loads' of time and frustration.

There are many programming aids available for the C64. They range from simple utility programs that you can load in, such as 'toolkit' type programming aids, disk turbo systems, tape turbo systems and so on.

It is often a tedious task to load and use these utilities, and this was thought of in the original design of the C64 and the C128. Both computers are equipped with a cartridge port. This was intended for extensions for the Basic and for game cartridges. In fact commodore did produce a few cartridge based games in the early life of the C64.

It is reasonable to expect that other manufactures have made use of the cartridge port. Most are of the game killer/backup type device, and are normally very simple devices. They are just a small printed circuit board and a ROM (sometimes an EPROM) chip. There is even a kit that you can buy to make up your own cartridges. Such cartridges do have one problem, and that is once it has been programmed it is not possible to reprogram it without replacing the internal ROM/EPROM chips.

EXPERT Reviewed

There is one notable exception to all of this. Some years ago a company called Trilogic produced a game killer cartridge called the EXPERT. in all the years that the Expert has been about, there has only been one major hardware upgrade. The internal ROM has never been changed. 'Why?' you might well ask. Well, the answer is simple, the Expert does not use any ROM/EPROM chips at all. The Expert is what is known as a 'soft' cartridge. Basically it contains some control logic and some RAM. You have to program the Expert cartridge from disk. Once loaded and switched on the Expert behaves as if it were a normal pre-programmed cartridge.

There are two disadvantages to this. The first is that it does take some time for the cartridge to be programmed. (normally about 30 seconds) and the second problem and the biggest is that if the computer is switched off the Expert will loose its program as well.

The big advantage is that new software can be developed and supplied very cheaply. The various upgrades to the software have been priced at about £5. The latest upgrade for the Expert is the V4 intergrated disk system. This has been programmed by NOW Computer systems. What you get is a double sided (flippy) disk one side contains the operating systems and the other has the instructions.

Loading

Getting the operating system loaded into the Expert is as easy as ever. You simply load '*',8 and the main menu will appear. You then select the system that you want to load into the Expert and follow the on screen prompts. The BIG advantage that V4.2 has is that you can swap between utility modules WITHOUT disrupting the program in memory!! This has transformed the Expert into a programmer's dream.

I do have one very large moan about this system. The instructions are supplied on the reverse side of the disk, however there is no provision for getting a printout of the instructions. Some of the modules are fairly complex and you do need to have some instructions beside you for reference. It took me a whole day to process the instructions into a form that I could load into a W.P. program and print out a copy. As there are some 11,000 words in the instructions you can see that some printouts will be required.

The Modules

Hacker/Hardcopy

This module contains the following: 1. Immortaliser; Joystick Autofire; Joystick Swap; Sprite Killer; Poker; Normal Hardcopy; and Reverse Hardcopy.

Immortaliser will attempt to find an infinite lives poke for you. Joystick Autofire checks for any references to the joystick port if any are found they are re-routed to a small patch routine which will give you an Autofire option.You can select either joystick 1 or joystick 2. Sprite Killer checks the program for any calls to the sprite collision locations ($D01Eor $D01F) and cancels them. Poker allows you to enter pokes listed in magazines without having to reset to Basic. Hardcopy is used when you want to print screen-dumps normally or in reverse. It will not print sprites. If the screen was raster-split, it will not work.

The Sprite Editor allows you to create and edit sprites anywhere in memory up to an amazing maximum of 1024 sprites! This is an amazing sprite editor, just look at the commands available to you(see Figure 1).

Figure 1: Sprite Editor

Restart Program	Cursor Top-Left	Mat. 'OR' Store
Screen-Viewer	Cursor Btm-Right	Mat. 'OR' Memory
New Memory	Move Cursor	Mat. To Store
Protect Memory	Draw Set/Clear Pix.	Memory To Mat.
Reset	Select Draw Colour	Store To Mat.
Exit Module	Set Colours	Mat. To memory
Background Colour	X-Symmetry On/Off	Swap Mat. With Store
Text Colour	Y-Symmetry On/Off	Swap Mat.With Mem.
Dos Commands	Matrix Hor. Flip	Reverse Matrix
Directory	Matrix Vert.Flip	Hires/Multi
Matrix Load	Roll Matrix Up	Clear Mat. Sprite
Matrix Save	Roll Matrix Down	Clear Mem. Sprite
Load Sprites	Roll Matrix Left	Scroll Sprites Left
Save Sprites	Roll Matrix Right	Scroll Sprites Rt.
Load 8 Sprites	Roll Matrix Row Left	Video Bank Up
Save 8 Sprites	Roll Mat. Row Rt.	Video Bank Down
View/Select/Load	Mat. 'AND' Store	Goto Memory Sprite
Menuloader	Mat. 'AND' Memory	Sprites Disp. Mode
	Mat. 'EOR' Store	Aauto-sprite get
	Mat. 'Eor' Memory	Repeats On/Off

You can now see why you need a hardcopy of the commands! Each one of these commands has a much more detailed description of the commands, and this is only one module!

The Character Editor is another graphics module, but mainly to do with editing the character sets. You can control the character set to a very fine degree, some of the options are:

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Background Colour
Text Colour
Dos Commands
Directory
Hires/Multi
Edit Mode
Video Bank Up
Video Bank Down
Character Set Up
Char.Set Down
Mat. Top-Left
Mat.Btm.Right
Scroll Matrix

The Picture Editor, Main Mode, is a very nice editor and just the job if you want to tweak a screen shot — only your imagination will limit you!

The whole of the screen (except for the bottom line) acts as a window on the picture. This displays an 8*8 representation of a 5*3 character square window overlaying the picture. This module uses the Vidcom format both for Hires and Multicolour pictures. There are a few dozen commands that go with this module as well, but in general the commands are fairly standard between modules of a similar type.

Main Menu

This is an updated version of the original Expert package. This module is ably to freeze any program and make a backup of it to disk. You should note that once a backup has been made it is not necessary to use the expert to reload the program as the backup is completely independent of the expert.

The functions that are contained in this module are:

Backup Memory	Disk Turbo On/Off	Reset
Load All-Memory	Screen-Viewer	Exit Module
Save All-Memory	Restart Program	Dos Commands
Save Backup	New Memory	Directory
Tape Backup	Protect Memory	Menuloader

This command allows you to compress the whole of memory into a single file which can then be saved. This is a brand new backup routine which takes less than 15 seconds and is more efficient than that used on the V4.1. The maximum time taken to make a Backup should be about 15 secs. (you then have to save the backup!)

The Disk Turbo works at about five times normal speed. This makes loading and saving backups much faster. The documentation claims them to be compatible with the 1541,1541C,Blue Chip & Oceanic OC-118N disk drives, However I have only used the 1571 drive with the expert and I have had no problems at all.

Monitors

It was my need for a good machine code monitor that caused me to buy the Expert, The monitor has a few new features and I think that it is still one of the most powerful monitors about, but beware you can cause system crashes with any monitor if you do not understand how to use them! There is also another monitor on the disk, this is a slightly improved version again, this one has a sprite view option and it is also able to look at itself. It is only worth loading if you really need the sprite view functions, otherwise stick to the standard monitor, it is much safer to use. As well as a monitor to the C64, this also acts as a monitor into the disk drive!

Some of the features are: Whole memory monitor including Ram, Rom,Colour and I/O - (load/save anywhere!); pre-programmed function keys; repeats; directory; load, (etc.); dis-assemble; monitor; and text Interpret Listings. Also, bi-directional scrolling in all three listing modes is Output to either screen or printer. If you have never used a monitor with this feature, you will wonder how you ever got on without it!.

Full unlisted opcodes implementation, full access to disk drive memory and a picture converter are also included. This module performs a variety of conversions on pictures, such as converting the standard text screen into a hires picture.

Extended Screen-Viewer Commands

When you enter the module it checks that the computer is set up for a picture. If it is then the converter is by-passed otherwise you are able to convert the screen into a picture or load one from disk.

Convert Standard Screen is a unique command that converts a standard resolution screen into a picture. It can convert from the Rom character sets or from a Ram based set. The editor section of this module is much the same as the picture editor and has similar commands. The Picture Formatter module allows you to load, save and convert between all the major formats.It also has a Disk Turbo and a 2-way picture flipper. Pictures can be loaded anywhere and will not use any memory other than that used by the picture. The Two-Way Picture Flipper works in such a way that pictures can be flipped horizontally or vertically without corrupting memory. And The Disk Editor allows you to edit bytes directly on the disk and has some extra features. It is NOT the sort of thing to play about with. ALWAYS use a copy disk and not the original. otherwise you could corrupt the disk beyond repair! It supports the standard Screen-Viewer (see Figure 2).

Figure 2: Extended Screen Viewer Commands

Restart Program	Move Cursor	Track Down
Screen-Viewer	Set Sprite Colours	Track Up
New	Load Sprite	Display Mode
Memory	Save Sprite	Text Display Mode
Protect Memory	Read Block	Find Memory
Reset	Write Block	Find Mode
Exit Module	Next Block	Get Address
Dos Commands	Previous Block	Set Address
Directory	Put In Buffer	Set Word
Cursor Top-Left	Get From Buffer	Byte Edit
Cursor Bottom-Right	Swap With Buffer	Text Edit
	Repeats On/Off	Clear Bytes
	Initialise	Hardcopy
	Jump To Link	Kill Block Stack
	Block Down	Menuloader
	Block Up	

Some of the more unusual commands allow you to: Load Sprite, which looks through a file and loads a sprite. The routine displays the sprite and gives you the option to load the sprite, search for the next sprite or quit. Display Mode, in which the block can be displayed either as Bytes (BYT) or Text (TXT). This was put to good use when searching for the instructions on the disk!

There is also Text Display Mode, in which the Text Display can be altered between Ascii (ASC) and Screen-Pokes (SCR). This is useful if you want to edit something like a hi-score table or the like. Find Memory, allows you to search for a memory pattern on the disk. If a mach is found the cursor is placed at the start of the match. In Get Address, the first four bytes of a file block information that determines the : Next Track, Next Sector, Load Address Lo and the Load Address Hi. This command will get this address.

In Hardcopy, the current block details are dumped to a printer. Byte and Text displays are valid for the dump.

In actual use the expert V4.2 is great! you tap the restore key and the main expert menu appears. This will be the menu for the module currently loaded. If you want to load another module then you must press the M

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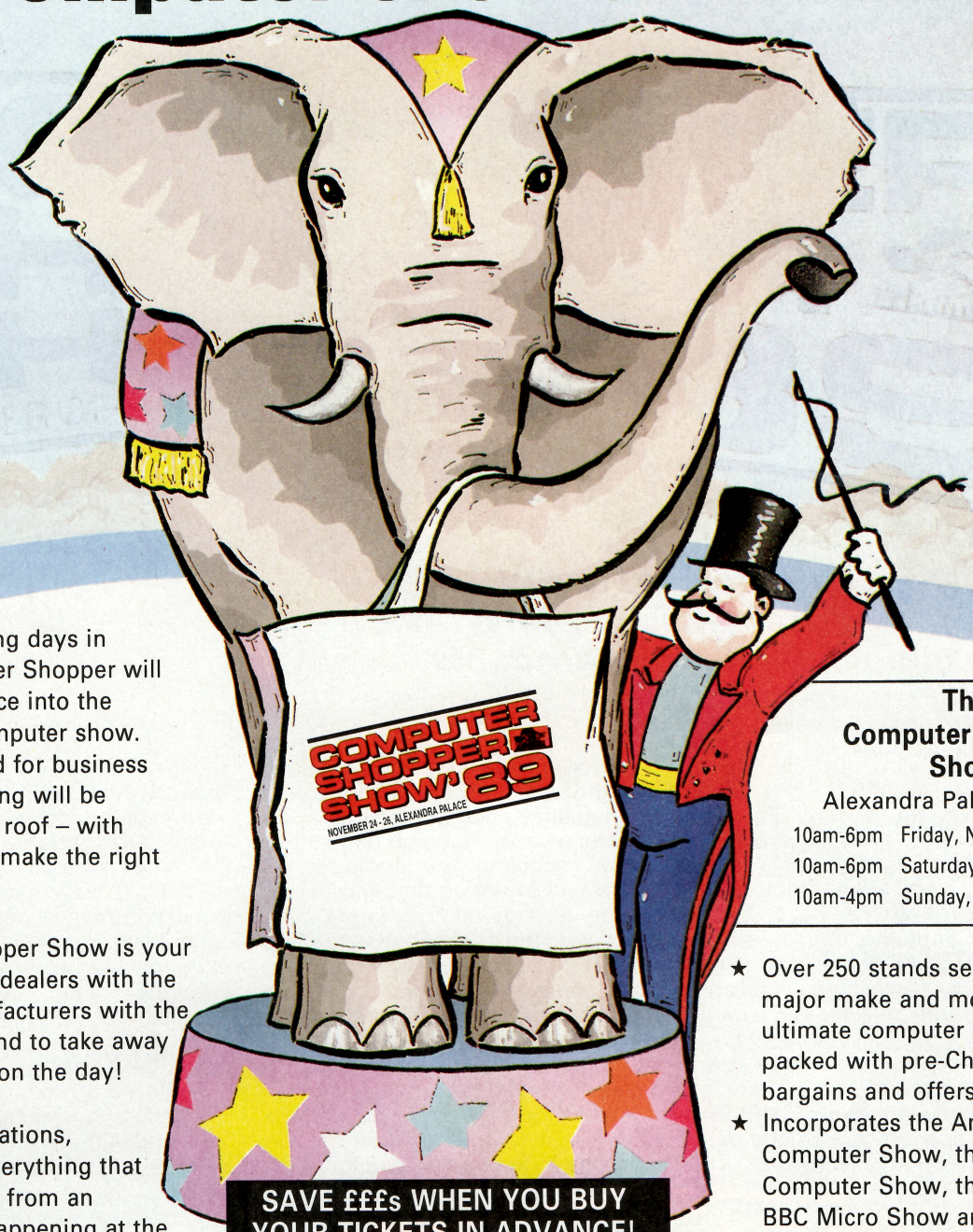

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The Future of Computer Sound

Part II

Kati Hamza continues her series on computer voice technology with a review of some exciting commercial products currently available.

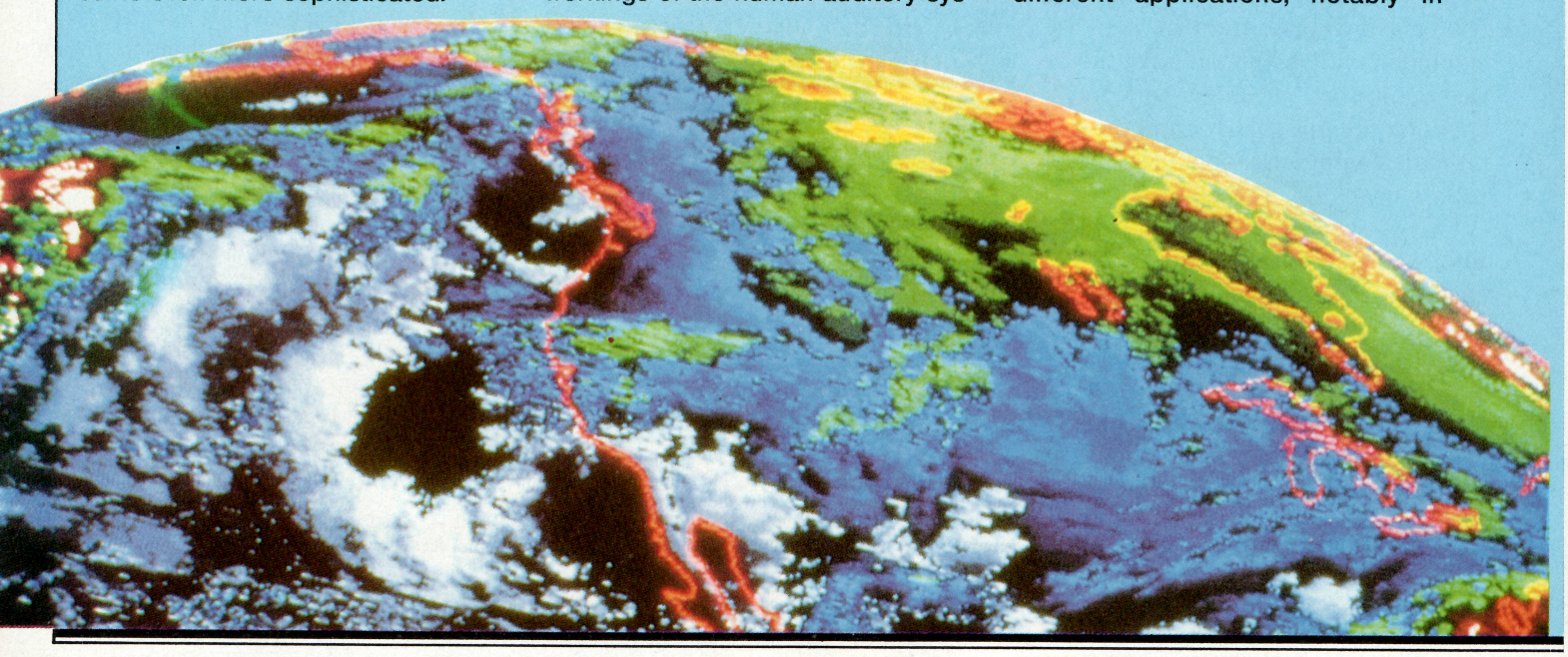
Voice technology is still in its comparative infancy; just baby talk, you might say. For an increasing number of businesses, the drawbacks are already being outweighed by the advantages and cost-effective systems have been successfully implemented for some time. On the other hand, high level interactive speech devices, which are to be the ultimate goal, remain a long way off. Just as developments in processing speed and storage capabilties will open up new programming possibilities, so will the algorithms involved in speech technology become even more sophisticated.

We have yet to program computers with the syntactical knowledge that distinguishes human beings; one obvious area of research concentrates on enabling the computer to aquire and to act on that knowledge as well. Already artificial intelligence techniques are being applied to voice technology. Some recognition systems attempt to predict words by statistical analysis of the words preceding them, thus simulating a form of contextual knowledge. Other research projects are coinciding with studies of the brain in the hope that a computer may one day simulate the workings of the human auditory system. It may even be possible to embody language ability in the networks of adaptive processing elements over longer periods of time.

Whatever the outcome, one thing is certain. If you have ever fancied conversing with your interactive PC or holding a conversation with the likes of Marvin the Android or a computer called Hal, hold your horses. You may have to wait some time.

VOX FAX

Despite its obvious limitations voice technology is proving itself more and more useful in a wide variety of different applications, notably in



manufacturing situations and as aids for the handicapped. Here are just a few examples:

* **One of the earliest examples** of commercially available synthesised speech was Texas Instruments' Speak & Spell, an educational toy designed to help primary school children with their spelling. This is is one area in which relatively simple speech technology can be used to great effect.

* **The Renault 25 'Electronique'** comes equipped with a synthesised voice to give the driver system warnings should there be, for example, a sudden drop in oil pressure or if the lights are left on. Reaction time is generally quicker than if the driver had to rely on noticing visual indicators.

* **Telephone answering machines** which make use of speech synthesis dispense with the need to record your own message - you just pick the words you want from a preprogrammed vocabulary.

* **At the Austin Rover Cowley** assembly plant, a voice controlled quality control system has replaced more traditional pen and paper methods. Before the technology was introduced inspectors had to rely on memory or large data sheets to perform their task. Any faults noticed were recorded on paper or entered into the computer some time after the event; there would always be a delay between the recognition and rectification of a fault. The modernised system involves two-way communication between computer and operator. Basically, the computer feeds the operator with the relevant verbal checklist and the operator responds by telling the computer whether the check has passed or failed and why it has failed. A rectification list is then printed out almost immediately, enabling any problems to be dealt with quickly. A system like this requires a small vocabulary and the nature of the task involves limited amounts of continuous speech; recognition error margins are reduced to about 2%.

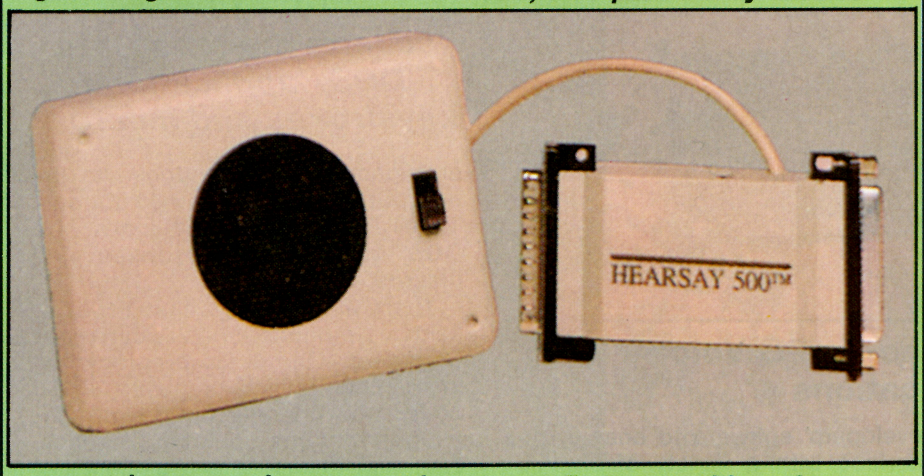
* **Increasingly, individuals with** partially or totally impaired speech are being helped by synthesisers. Phony 1, a German system, has a vocabulary of 100 words which can be summoned via a ten-digit keyboard. The slightly more advanced Gerhard system has been designed especially with intelligent young people suffering from athetosis or spasticity in mind. It is equipped with 40 character LCD, a printer and an alphanumeric keyboard complete with function keys to select the most frequently recurring sentences.

* **Researchers are currently investigating** the potential for speech recognition to aid patients with impaired hearing. One possible solution, also from Germany, involves a

continued on page 26

Voice Technology and your Commodore

Speech synthesis of sorts is within the capabilities of most Commodore computers. With a little ingenuity, you can even persuade your +4 to say hello. The sound quality of +4 and C64 or 128 speech wouldn't be that high though and there isn't enough processing power to turn it into a particularly useful application.



For speech synthesis on your PC, a number of companies, such as Texas Instruments, produce speech synthesis add-ons fitted with an internal or external loudspeaker, which enable you to adapt your own applications.

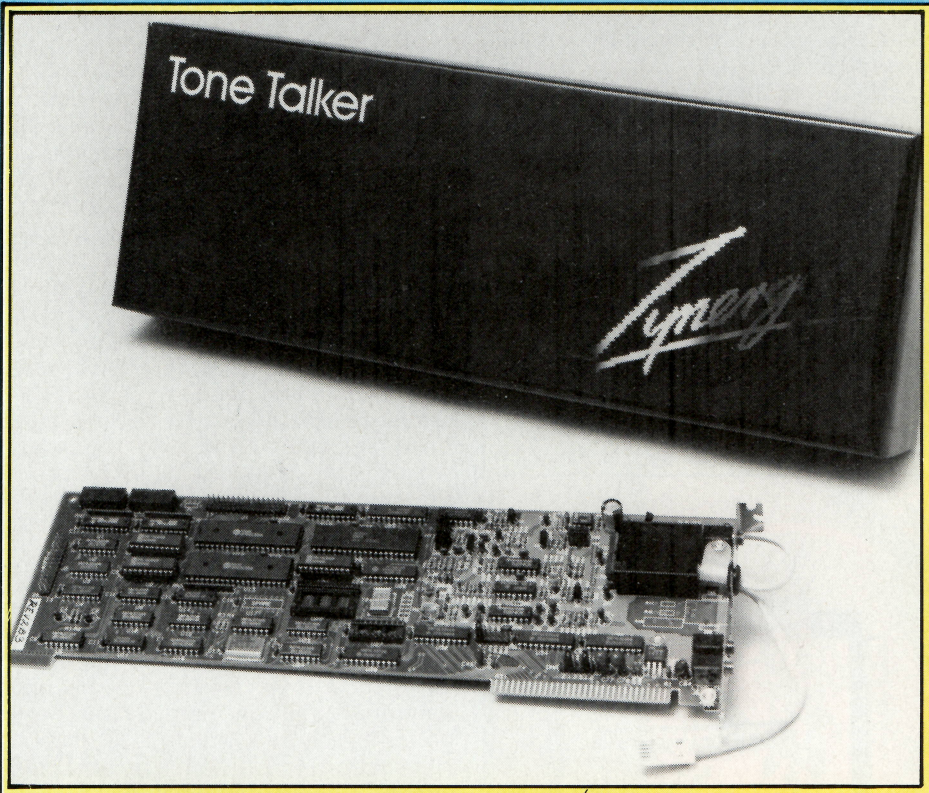
It's the Amiga's sound chip however, that is probably best suited to creating a synthetic voice. The SAY option on the Workbench translates text into synthesised speech and gives you a choice of four different Americanised voices - male, female, natural and robot - all of which sound pretty similar. Amiga Basic lets you construct phoneme codes and specify the characteristics of the voice that is to speak. This means deciding on values for base pitch, inflection, speaking rate (40-400 wpm), volume and so on.

Speech recognition boards are generally manufactured with PC, XT and AT compatibles in mind. Generally, these come in the form of an expansion card, a number of disks, a microphone and a loudspeaker. A modicum of technical knowledge helps while you're setting up the system; and, as it is likely to be speaker dependent, you will have to spend some time training it to recognise your voice. Once set up, the average system recognises simple DOS commands, allows you to open and close files and accepts prompts like 'edit', 'filename' and so on.

Some, like the Introvoice from TVC, incorporate a synthesiser to confirm recognition of commands.

The Hearsay 500 (MSDOS) and 1000 (C64/128) models are hardware/software arrangements that understand voice input commands. The command string is output in such a way that the C64 thinks that it has come from the keyboard (see CCI ***June, page 26).***

The more you pay, the larger your potential vocabulary gets. Cherry Electrical, for example produces the VoiceScribe 1000 with a vocabulary of up to 1000 words or commands for around £900; a cheaper version for around £400 recognises about 128 different words. Even with all these available commands though, you're unlikely to be using these systems to take dictation. Error margins and comparative slowness of response mean that in most cases using the keyboard is much quicker. On the other hand, a voice board linked to your answering machine would make it possible to communicate long distance with your computer and for anyone unable to use their hands, a way of controlling their computer without them has to be a boon.



Interactive Telephone-To-PC Voice Communications

Voice-to-computer communication has previously required expensive mini or even mainframe-based systems. At least one company has provided a commercial solution. The Zynergy ToneTalker allows for interactive communication, via any touch-tone (DTMF) telephone, with popular MS-DOS programs running on IBM or compatible personal computers.

Developed by Pantel International Ltd., ToneTalker is voice-to-computer communication hardware-software combination. Fully approved by BABT for use with UK telephone systems, Pantel claims that ToneTalker is the first product of its kind to become available in this country.

ToneTalker consists of a multi-layered, full-size board which fits inside the PC, together with a set of developers' software to enable it to interface with a variety of applications. The software sits between DOS and each user's own applications such as Pegasus accounts, Lotus spreadsheets or a dBase database. In one direction it takes the output from the application program and coverts it to voice; in the other, it converts the touch tones generated by the telephone into DOS/application keystrokes and macros.

Prices are £1195 for the board and transaction processing software and £1795 for the Developers' Kit. This means that an application can be up and running for around £4,000, including the PC hardware. Pantel claim this compares to the current cheapest, mini-based alternative at over £60,000.

Typical ToneTalker applications include: telephone answering, computerised public address systems, remote control of security systems, remote reading of any PC-held correspondence, order-processing, remote stock enquiries, sales order processing, home banking, bulletin boards and talking databases. ToneTalker can even enable remote communication with a mainframe or mini, via a PC.

Input to ToneTalker is via numbers dialled on the user's DTMF telephone, or via a keypad (also available from Pantel) which can be held over the mouthpiece of older telephones. Numbers can be keyed in by pre-arrangement or in response to the computer's spoken instructions. ToneTalker coverts the tones into DOS/applications keystrokes and macros.

"ToneTalker coverts the tones into DOS/ applications keystrokes and macros."

There are two ways that ToneTalker can be made to speak what it sees on screen. One is via programming instructions which translate ASCII code into phonetics. Foreign language versions including French, German, Italian and Spanish are available. The second option is for the user to record specific words and numbers via a microphone into a Voice Library; ToneTalker will then integrate them into coherent phrases.

ToneTalker is manufactured in Canada by BCB Electronics Sales Inc. Pantel International is the sole UK vendor and has reworked the product, in cooperation with BCB, to adapt it for the UK, where it is marketed under the 'Zynergy' brand name. Over 1,500 ToneTalker systems have been sold throughout the USA and Canada since its launch in 1986, according to the company.

Contact: Pantel International Limited, Automation House, Ledgers Road, Slough, Berks, SL1 2RQ. Tel: 0753 21610.

processor being implanted into the ear. This is coupled magnetically with a speech processor and microphone - a keyboard allows the wearer to adjust the system. The electronic implant itself is inserted in a recess cut into the bone behind the ear and the speech processor is just about the size of a cigarette packet. The bionic man may be a possibility yet!

*** The translation of the written word** or data on a computer screen into synthesised speech can be extremely helpful to the blind. The Kurzweil Personal Reader is portable scanning system capable of reading a wide variety of typeset and typewritten material and converting it into speech. It can read up to 350 words a minute and to overcome the problems associated with a uniform computerised tone, it has a choice of nine different voices. It can also be used as a data entry system to PC and Apple systems and the synthesiser can be linked with screen software to create a talking terminal. A machine like this opens up all sorts of possibilities for the visually impaired but at present it's still rather expensive. For blind people in search of a means of using a word-processor, the talking version of Arnor's Protext should become available later this year. Options include the power to speak each key and word as they are typed, read back lines and paragraphs and give status information as required.

K.H.

The Care and Feeding of the C256

Part II

Below are the remaining programs for Paul Bosacki's informative article on fattening up your C64.

```
;*****************************************
;*          Config256.lnk                *
;*                                       *
;* Here are the link file directives for *
;* Config256.                            *
;*****************************************

.output configure256      ;application name
.header Config256.hd.rel  ;header definitions
.seq                      ;sequential file type
.psect  $0400             ;loads in at $400
 Config256.mn.rel         ;link this file

;*****************************************
;*             Config256.Sym             *
;*                                       *
;* These are the GEOS equates for Config256 *
;*****************************************

;*** Geos OS_TAB Routines Used ***

CmpFString      =     $c268
DoDlgBox        =     $c256
DoIcons         =     $c15a
DoMenu          =     $c151
DoPreviousMenu  =     $c190
EnterDeskTop    =     $c22c
GetBlock        =     $c1e4
MoveData        =     $c17e
NewDisk         =     $c1e1
PutBlock        =     $c1e7
ReDoMenu        =     $c193
SetDevice       =     $c2b0

;*** Misc. Equates ***

CPU_DATA        =     $0001
CPU_DDR         =     $0000
curDevice       =     $00ba
curDrive        =     $8489
diskBlkBuf      =     $8000
dispBufferOn    =     $002a
numDrives       =     $848d

;*** Geos Constants ***

APPLICATION  =     6
BOLDON       =     24
DEF_DB_POS   =     $80
DBSYSOPVEC   =     14
DBTXTSTR     =     11
DIR_TRACK    =     18
HORIZONTAL   =     0
MENU_ACTION  =     0
NULL         =     0
SEQUENTIAL   =     0
ST_WR_FORE   =     $80
TXT_LN_X     =     16
TXT_LN_2_Y   =     32
TXT_LN_3_Y   =     48
USR          =     4
VERTICAL     =     $80

;*** Geos Pseudo-Register Definitions ***

r0          ==     $0002
r0H         ==     $0003
r0L         ==     $0002
r1          ==     $0004
r1H         ==     $0005
r1L         ==     $0004
r2          ==     $0006
r2H         ==     $0007
r2L         ==     $0006
r3          ==     $0008
r3H         ==     $0009
r3L         ==     $0008
r4          ==     $000A
r4H         ==     $000B
r4L         ==     $000A

;*****************************************
;*         RamDisk Driver (GEOS)         *
;*                                       *
;* This program creates a RAMdisk        *
;* driver for GEOS. Runs as an application. *
;* Leaves a transfer routine and patch.  *
;*****************************************
;
.if Pass1
  .include Config256.sym
  .include geosMac
.endif
;
.zsect $02        ;zpage begins
                  ;at r0
source:           .block 2
destination:      .block 2
tlength:          .block 2
Sbank:            .block 1
Dbank:            .block 1
;
; CPU_DATA: This is the Bank Control Reg.
; Four banks of 64K are available.
; The register is laid out like this:
;
; bit 0: ROM select
; bit 1: ROM select
; bit 2: ROM select
; bit 3: bank select (LA16)     see schematic
; bit 4: bank select (LA17)     "      "
; bit 5: cassette motor
; bit 6: n/a
; bit 7: n/a
;
C_numDrives  =  $c013
BankMove     =  $02a7
.psect
;
Init: LoadB dispBufferOn, #ST_WR_FORE
      lda C_numDrives     ;program called
      beq 11$             ;first time?
      jmp FromDesk
11$:  lda CPU_DATA        ;do initalization
      and #%00010000      ;are we in bank0?
      cmp #%00010000      ;if not, put up
      beq 10$             ;error message and
      LoadW r0,#NotB0_Tab ;exit to DeskTop.
      jsr DoDlgBox
      jmp Do_quit
10$:  lda curDevice
      sta Copy_curDevice
      lda numDrives
      sta C_numDrives
      jsr Install_Drive      ;install code patch
      LoadW r4, #diskBlkBuf  ;and move transfer
      LoadB r1L,#DIR_TRACK   ;routine to BankMove
      LoadB r1H, #0
      jsr GetBlock
      LoadW r0, #diskBlkBuf+144   ;offset to
      LoadW r1, #headerTitle+144  ;diskname
      ldy #$02
      ldx #$04
      lda #$10
      jsr CmpFString  ;has ramdisk already been
      beq 12$         ;formated? If so bypass
      jsr Format_Rdri ;format routine.
12$:  jmp Do_quit
;
FromDesk:
      lda curDevice       ;save current device
      sta Copy_curDevice
      LoadW r0, #Menu_Tab ;put up selection menu
      lda #0              ;pointer is placed
      jsr DoMenu          ;on first item
      rts
      ;
BX_TOP     =0
BX_HEIGHT  =$0c
BX_LEFT    =0    ;last two used as word values
BX_WIDTH   =$89  ;when declaring menu dimensions
;
Menu_Tab: .byte BX_TOP
          .byte BX_TOP+BX_HEIGHT
          .word BX_LEFT+BX_WIDTH
```

```
          .word BX_LEFT+BX_WIDTH+35
          .byte 1|HORIZONTAL
          .word DiskText
          .byte VERTICAL
          .word DiskSubMenu
;
DiskSubMenu:
          .byte BX_TOP+13
          .byte BX_TOP+(14*7)+1
          .word BX_LEFT+BX_WIDTH
          .word BX_LEFT+BX_WIDTH+75
          .byte 6|VERTICAL
          .word Txt_format
          .byte MENU_ACTION
          .word Do_format
          .word Txt_dra
          .byte MENU_ACTION
          .wrd Do_dra
          .word Txt_drb
          .byte MENU_ACTION
          .word Do_drb
          .word Txt_flip
          .byte MENU_ACTION
          .word Do_flip
          .word Txt_noram
          .byte MENU_ACTION
          .word Do_noram
          .word Txt_quit
          .byte MENU_ACTION
          .word Do_quit
;
DiskText:     .byte "RDrive", NULL
Txt_format:   .byte "format", NULL
Txt_dra:      .byte "RamDri A", NULL
Txt_drb:      .byte "RamDri B", NULL
Txt_flip:     .byte "flip", NULL
Txt_noram:    .byte "1541", NULL
Txt_quit:     .byte "quit", NULL
;
;
NotB0_Tab:.byte DEF_DB_POS|1
          .byte DBTXTSTR
          .byte TXT_LN_X
          .byte TXT_LN_2_Y
          .word N_bk0_1
          .byte DBTXTSTR
          .byte TXT_LN_X
          .byte TXT_LN_3_Y
          .word N_bk0_2
          .byte DBSYSOPVEC, 0
;
N_bk0_1:
      .byte BOLDON, "This module can only be", 0
N_bk0_2:
      .byte BOLDON, "installed from BANK 0", 0
;
RDevice:  .byte #9  ;default ramdisk=device 9
Copy_curDevice:     .block 1
;
Do_format:
      jsr ReDoMenu
      lda #2
      sta numDrives
      jsr Format_Rdri
      rts
;
Do_dra:
      jsr ReDoMenu
      lda C_numDrives ;if there is only one 1541
      cmp #1          ;on the system then this
      bne 1$          ;option does not allow a
      rts             ;ramdrive as device #8
1$:   ldy #8
      sty RDevice
      bne Set_Device
Do_drb:
      jsr ReDoMenu
      ldy #9
      sty RDevice
Set_Device:
      lda #2
      sta numDrives       ;update # of drives
      lda #$81
      sta $8486,y
      cpy #8
      bne 5$
      iny
10$:  and #%00000001      ;make drive type 1541
      sta $8486,y
      tya
      jsr SetDevice ;pass device # in acc.
                    ;Set_Device make that device
      jsr NewDisk   ;and updates drive varibles
      rts           ;initializes new disk
5$:   dey
      bra 10$
;
Do_flip:  jsr DoPreviousMenu  ;roll up menu
          ldy #8
          lda $8486,y
          pha
          iny
          lda $8486,y
          dey
          sta $8486,y
          iny
          pla
          sta $8486,y
          bmi 10$
          tya
          jsr SetDevice
          jsr NewDisk
          jmp Do_quit
10$:      dey
          tya
          jsr SetDevice
          jsr NewDisk
          jmp Do_quit
;
Do_noram: jsr ReDoMenu    ;simply put, restores
          lda #1          ;1541's to system.
          ldy #8          ;Checks C_numDrives
          sta $8486,y     ;for the number of
          lda C_numDrives ;1541's.
          cmp #1
          bne 10$
          lda #0
          ldy #9
          sta $8486,y
          lda #1
          sta numDrives
          jmp Do_quit
10$:      lda #1
          ldy #9
          sta $8486,y
          jmp Do_quit
;
Do_quit:  lda numDrives
          cmp #1
          bne 1$
          lda #8
          sta Copy_curDevice
1$:       lda Copy_curDevice ;restore curDrive
          jsr SetDevice      ;on entry to
          jmp EnterDeskTop   ;application.
;
; Geos disk routines read a block at a time.
; Because of this, our transfer routine requires
; only enough code to transfer 256 bytes.
;
s_BankMove:
      PushB CPU_DATA
      PushB CPU_DDR
      ora #%00010000      ;set CASS Sense to
      sta CPU_DDR         ;output. Restored at
      ldy #0              ;exit from routine
      ldx Dbank           ;from stack.
20$:  lda Sbank
      sta CPU_DATA
      lda (source),y
      stx CPU_DATA
      sta (destination),y
      iny
      bne 20$
;
      PopB CPU_DDR
      PopB CPU_DATA
      rts
;
;
e_BankMove:
;
BankLen = e_BankMove-s_BankMove
      ; *** Patch GEOS Routines and
      ; transfer move block routine***
;
RamCode  == $9c80
;
Install_Drive:
      LoadW r0,#s_BankCode ;install RAM driver
      LoadW r1,#RamCode    ;code. This code then
      LoadW r2,#CodeLen    ;overwrites the
      jsr MoveData         ;existing GEOS routine
;
      LoadW r0, #s_BankMove  ;move transfer
      LoadW r1, #BankMove    ;routine to
      LoadW r2, #BankLen     ;BankMove.
      jsr MoveData
      rts
;
s_BankCode:
      ldx #0   ;dummy routine for the
      lda #0   ;verify RAM call
      rts
      nop
      nop
      nop
;
; following code replaces the GEOS RAMex driver.
;
      ldx #1             ;fetch
      bne 10$
      ldx #0             ;stash
10$:  PushW r0
      PushW r1
      PushW r3
      ldy destination
;
; GetBlock and PutBlock routines pass
; the track value in r1L, and sector in r1H.
;
      dey
      lda RDTab,y        ;get RAM track value
      clc
      adc destination+1  ;add in sector as offset
      sta destination+1
```

```
      lda #%00111000      ;value for Bank1
      cpy #11             ;if track<11 then Bank1
      bcc 40$
      lda #%00100000      ;value for Bank2
      cpy #23             ;if track<23 then Bank2
      bcc 40$             ;else Bank3
      lda #%00101000      ;value for Bank3
40$:  sta Dbank
      ldy #%00110000
      sty Sbank
      ldy #0
      sty destination
      ldy r4H
      sty source+1
      ldy r4L
      sty source
      cpx #1      ;if Fetch then flip source and
                  ;destination as well as source
      bne 60$     ;and destination banks.
      PushB Dbank
      MoveW destination, source
      MoveW r4, destination
      MoveB Sbank, Dbank
      PopB Sbank
60$:  jsr BankMove  ;jump to block transfer
      PopW r3       ;routine. restore
      PopW r1       ;pseudo-registers
      PopW r0
      ldx #0        ;disk errors passed in x.
      lda #0        ;0=no error.
      rts

;RamDiskTab is a table of RAM page values used
;by the RAMex driver in order to determine the
;location of each track and sector. It works like
;this: each value represents Track XX, Sector 0,
;where XX is a validtrack. The sector number is
;then used as an offset. For example, Track 1,
;Sector 8 =4+8=12, or, Bank1, RAM page 12.

RamDiskTab:
      .byte $04,$1a,$30,$46,$5c,$72,$88,$9e
      .byte $b4,$ca,$e0,$04,$1a,$30,$46,$5c
      .byte $72,$88,$9c,$b0,$c4,$d8,$ec,$04
      .byte $18,$2b,$3e,$51,$64,$77,$8a,$9c
      .byte $ae,$c0,$d2,$e4
;
e_BankCode:
;
RDTab     = RamCode+(RamDiskTab-s_BankCode)
CodeLen   = e_BankCode-s_BankCode;

Format_Rdri:
      ldy RDevice     ;get RAMdrive #.
      lda #$81        ;high bit set=RAM device,
                      ;therefore $82=1571
      sta $8486,y     ;under geos.
      sty curDrive
      LoadW r4, #header      ;set up for PutBlock
      LoadB r1L,#DIR_TRACK   ;write header out to
      LoadB r1H, #0          ;18/0
      jsr PutBlock
      ldy #0
      tya
10$:  sta diskBlkBuf,y
      dey
      bne 10$
      lda #$ff
      sta diskBlkBuf+1
      LoadW r4, #diskBlkBuf
      LoadB r1L, #19         ;set up GEOS border
                             ;directory block &
      LoadB r1H, #08         ;write out to 19/8
      jsr PutBlock
      LoadW r4, #diskBlkBuf
      LoadB r1L, #DIR_TRACK  ;pass same block
      LoadB r1H, #1          ;to 18/1
      jsr PutBlock
      lda #0
      ldx #0                 ;no errors
      rts
;
header:
  .byte $12, $01, $41, $00  ;exactly what the
                            ;name implies the
  .byte $15, $ff, $ff, $1f  ;header block
  .byte $15, $ff, $ff, $1f  ;writen out by
  .byte $15, $ff, $ff, $1f  ;the PutBlock
  .byte $15, $ff, $ff, $1f  ;routine to 18/0
  .byte $15, $ff, $ff, $1f
  .byte $15, $ff, $ff, $1f
  .byte $15, $ff, $ff, $1f
  .byte $15, $ff, $ff, $1f
  .byte $15, $ff, $ff, $1f
  .byte $15, $ff, $ff, $1f
  .byte $15, $ff, $ff, $1f
  .byte $15, $ff, $ff, $1f
  .byte $15, $ff, $ff, $1f
  .byte $15, $ff, $ff, $1f
  .byte $15, $ff, $ff, $1f
  .byte $15, $ff, $ff, $1f
  .byte $15, $ff, $ff, $1f
  .byte $11, $fc, $ff, $07
  .byte $12, $ff, $fe, $07
  .byte $13, $ff, $ff, $07
  .byte $13, $ff, $ff, $07
  .byte $13, $ff, $ff, $07
  .byte $13, $ff, $ff, $07
```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```
   .byte $13, $ff, $ff, $07
   .byte $12, $ff, $ff, $03
   .byte $12, $ff, $ff, $03
   .byte $12, $ff, $ff, $03
   .byte $12, $ff, $ff, $03
   .byte $12, $ff, $ff, $03
   .byte $12, $ff, $ff, $03
   .byte $11, $ff, $ff, $01
   .byte $11, $ff, $ff, $01
   .byte $11, $ff, $ff, $01
   .byte $11, $ff, $ff, $01
   .byte $11, $ff, $ff, $01
headerTitle:     .byte "BRam 1541"

     .byte 160,160,160,160,160
     .byte 160,160,160,160
     .byte $52, $44, $A0, $32
     .byte $41, $A0, $A0, $A0
     .byte $A0, $13, $08
     .byte "GEOS format V1.0"
     .byte 0,0,0,0,0,0,0,0,0,0,0
     .byte 0,0,0,0,0,0,0,0,0,0,0
     .byte 0,0,0,0,0,0,0,0,0,0,0
     .byte 0,0,0,0,0,0,0,0,0,0,0
     .byte 0,0,0,0,0,0,0,0,0,0,0
     .byte 0,0,0,0,0,0,0,0,0,0,0
;
ProgEnd:
.end

;****************************************
;*          MemTest.lnk                 *
;*                                      *
;* Here are the link file directives for *
;* MemTest.                             *
;****************************************

; The program MemTest.mn links to $033c: the
; cassette buffer. Start MEMTEST with "sys828."

.output   MEMTEST ;name of the output.
.cbm              ;the linked file will
                  ;be in the standard pre-Geos
.psect    $033c   ;format. Cassette buffer
                  ;always lies within CRAM.
    MemTest.rel   ;link this file

;***********************************************
;*              MemTest.mn                     *
;*                                             *
;* This program tests each bank of             *
;* memory, setting each bit=0 then each        *
;* bit=1. It runs from and returns to BASIC.   *
;***********************************************

.if     Pass1
  .include     geosMac
.endif

;equates used:
a0        = $fb
a0L       = $fb
a0H       = $fc
CPU_DDR   = $00
CPU_DATA  = $01
CLRSCR    = $e544
STROUT    = $ab1e
SCRTCH    = $a642

NULL      = 0

;This is not a comprehensive memory test, nor is
;it meant to be. Simply, each bit throughout an
;entire bank is set to one and then tested for
;this value. Then each bit is set to zero, and
;tested again. On failure the screen is cleared
;and an error message is generated. A10 must be
;set to "considered" for a thorough test. If AEC
;is disabled, then the screen will change each
;time a new phase of the test is entered
;providing a visual record of the test. The
;program runs in less than 30 secs., and then
;returns to BASIC.

Progstart: lda CPU_DATA       ;push configuration
;onto stack to be restored on exit from routine.
      pha
      lda CPU_DDR
      pha
      ora #%00010000      ;set bit 4 to output
      sta CPU_DDR
      lda #%00110000      ;all ram Bank0
      sta CPU_DATA
      jsr MemTest
      lda #%00111000      ;all ram Bank1
      sta CPU_DATA
      inc bankValue       ;ascii value
;used by errMess to indicate Bank in which
;fault occurred.
      jsr MemTest
      lda #%00100000      ;all ram Bank2
      sta CPU_DATA
      inc bankValue
      jsr MemTest
      lda #%00101000      ;all ram Bank3
      sta CPU_DATA
      inc bankValue
      jsr MemTest
      PopB CPU_DDR        ;restore configuration
      PopB CPU_DATA
      cli                 ;clear interrupt flag
                          ;set by MemTest routine
      jsr CLRSCR
      lda #0
      jsr SCRTCH
      rts

testvalue: .byte $ff

MemTest:  lda #255        ;first set each bit of
                          ;each location to one.
          sta testvalue
          sei
MemLoop:  lda #4          ;start address to test
;in this case $0400. This is the lowest CRAM can
;be set allowing each bank to be fully tested.
      sta a0H
      lda #0
      sta a0L
      tay
      lda testvalue
1$:   sta (a0), y         ;write test value out
      iny
      bne 1$
      inc a0H
      bne 1$
      lda #4
      sta a0H
      lda #0
      sta a0L
      tay
2$:   lda (a0), y
      cmp testvalue
      bne 3$
      iny
      bne 2$
      inc a0H
      bne 2$
      lda testvalue       ;if testvalue=0 then
                          ;set up for 2nd pass.
      bne 4$
      rts

4$:   inc testvalue       ;now set each bit=0
      jmp MemLoop

3$:   PushB CPU_DATA      ;save configuration
      ora #7
      sta CPU_DATA        ;and map in ROM's
      lda #[errMess
      ldy #]errMess
      jsr STROUT          ;use BASIC routine to
                          ;output error message.
      PopB CPU_DATA
      rts


errMess:  .byte 147,11,"  FAULT FOUND IN"
          .byte " MEMORY: BANK"

bankValue:.byte 48            ;ascii "0"
          .byte 11,11,13,NULL
```

The following macros are from the file 'geosMac' supplied with geoProgrammer.

```
.macro LoadB dest,value
       lda #value
       sta dest
.endm
.macro LoadW dest,value
       lda #](value)
       sta dest+1
       lda #[(value)
       sta dest+0
.endm
.macro MoveB source,dest
       lda source
       sta dest
.endm
.macro MoveW source,dest
       lda source+1
       sta dest+1
       lda source+0
       sta dest+0
.endm
.macro add source
       clc
       adc source
.endm
.macro AddB source,dest
       clc
       lda source
       adc dest
       sta dest
.endm
.macro AddW source,dest
       lda source
       clc
       adc dest+0
       sta dest+0
       lda source+1
       adc dest+1
       sta dest+1
.endm
.macro AddVB value,dest
       lda dest
       clc
       adc #value
       sta dest
```

Continued next month

Feature

A Breath of Fresh Air

Len Keighley provides a refreshing explanation of PC Windows.

The term 'Windows' has been around for some time, but what does it actually mean? In general it is a term more normally associated with IBM and clone PCs but the Amiga's workbench is also a 'window' environment. An initial glance results in confusion because depending on your viewpoint it can have two meanings. The first and most complex meaning, is its use as a descriptive term for Object Oriented Programming, which basically means that *it is a process capable of starting up another process*. The second meaning is a little more understandable, but nevertheless is still related to the first, and concerns those packages that are available under the 'Windows' heading. The most notable of these, of course, being Microsoft Windows. To help clarify the situation the following gives basic background details to both of these meanings.

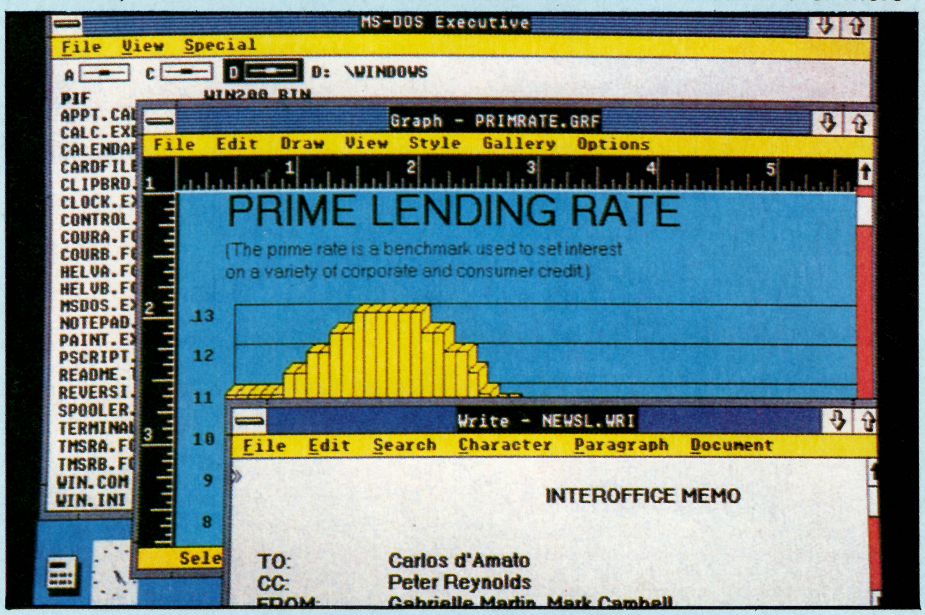
Object Oriented Programming

Object Oriented Programming (OOP) involves a distinct area of the screen and memory in which processes can be created or destroyed (stopped or started), for example, 'clicking' on a window.

The result of OOP gives the impression of multi-tasking, eg two process running at one time. Although this is in fact the case, only one of the 'windows' displayed on a screen can actually be accessed at a time. This means that as a user, data or commands can only be entered in one 'window' at a time.

However, the DOS system has been built around the the concept of a single running task. 'Windows' processes have extended this so that more than one process can 'share' the Central Processing Unit (CPU), thus giving the impression of multi-tasking. However, only one process uses the CPU at a time and each only gives up its use when interupted. At which time the next, highest priority, task commences its use.

With this in mind, it can be seen that when two processes are displayed on the screen in separate windows, each is actually still running and even though only one can be accessed by the user, the lower level 'window' can still be seen to change. This assumes, of course, that the lower level 'window' is not halted, waiting user input. An example of this can be seen on the Amiga and its use of windows to display the drawing of various shapes. If all of these are opened and started, even though the highest level 'window' may be doing something completely different, each of the shapes will continue to change. Another example is when a lower level window is running a clock, the second hand can be seen to continue moving. It is only when one of the other windows takes up a large chunk of the CPU that the second hand can be seen to jump.



Commercial Applications

A number of tasks can be started in a window, each of which may be a window in its own right. 'Windows' packages, control the input and output between the individual tasks and the DOS environment. The 'Windows' packages are therefore more sophisticated operating systems that "sit on top of DOS" control and the multi-tasking requirements.

What then is the purpose of 'Windows'? In the main it will depend on your use of various programs and the need to be able to see two or more different 'pictures' on the screen at the same time. This can also run to two different views of the same program.

There are quite a number of these on the market now and we will take a brief look at three of them. Each implements the 'windows' concept in different way. Some allow concurrent processing, eg seeing two or more running processes at the same time. Those that do not run concurrently, provide quick and easy ways of loading other processes, which when completed, return control to the 'window' system.

Microsoft Windows

This is probably the best known of all the windows packages and has, of course, been developed by the company responsible for MSDOS itself. It implements the 'windows' concept concurrently used and comes com-

continued on page 35

Fantavision

Len Keighley reports from the director's chair on an animation program for would-be movie makers.

Have you ever felt that you would like to produce your own cartoons in the mould of Walt Disney, or even produce your own TV effects like Channel 4's twisting logo. Commodore PC users can now fulfill this dream using the new package, Fantavision, written by Broderbund and distributed by In-Touch. The package is part of Broderbund's Creative Workshop Series and must rank as one of the most innovative pieces of software on the market today.

The program provides a mechanism for creating moving images from individual still pictures. This is much in the same way that some of the Star Wars and Last Starfighter sequences were produced. Those films used Cray Supercomputers for a number of hours to produce a short clip of film. Using Fantavision your PC will produce 'movies' using the same basic techniques.



Tween Generation

The basis of the 'movie' are objects and a single still frame can contain up to sixteen objects. As each object changes its position, on successive frames, the software creates the required images between the two stills, these are known as 'tweens'. Each 'tween' is another still picture but when run together give the impression of a moving image, just like a cartoon.

"Each object is drawn by use of the mouse by clicking at the position on the screen at which you require the point."

Each object consists of up to sixty-four points which are connected together by a straight line. Over successive 'tweens' these lines then expand or reduce as the movement of the object dictates. Each object is drawn by use of the mouse by clicking at the position on the screen at which you require the point. This is very much like connecting the dots pictures that are popular in children's books.

The package provides a workbench on which moving graphical images can be produced. To do this it uses a large number of effects options which are accessed by use of the mouse. The 'movie' must first of all start with a backdrop and these can be designed using Fantavision or imported from another art package, PC Paintbrush. Once set up the Backdrop will be used in all the frames of the movie.

Along similar lines to Backdrops are French Windows which act like putting a screen in front of the movie with a window, through which you can see the objects moving. Any object not in front of the window cannot be seen. In addition various options are available for the enhancement of your objects movement. A Trace option allows after-images to be retained, as the object moves across the screen, another option is Lightning which produces flashing effects.

Image Making

The construction of the object is only really constrained by the number of points and the size of screen. The workbench provides some features that help to draw the objects with higher definition. The simplest of these are the circle and rectangle icons which produce better products than use of the mouse alone. Objects can be captured and manipulated by Edit commands which allow copying, pasting and deletion (zapping). If only small changes are to be made on successive 'stills' the whole frame can be 'cloned' thus requiring only the moving items to be changed. If you require more than 16 objects in your 'movie' it is possible to make some objects part of the backdrop thereby freeing an object number

"Text can also be entered in the movie and this is treated to differently than any other object."

to be used for your new object. The effect produced is such that they become frozen. This would be useful, for example, where the 'movie' contains a single object which separates into two. One of these could become part of the backdrop.

Text can also be entered in the movie and this is treated no differently than any other object. Therefore it is possible to make an object on the screen turn into the words 'THE END'.

There is also the sound, for these do not need to be silent 'movies'. The package contains an extensive list of readymade sound effects which can be assigned to a particular frame of the 'movie' from barking dogs to buzzsaws. It is also possible to create and store your own sound effects by means of the setting of the relevant frequency and sustain levels.

Action!

A GO icon is used on the workbench to play back your movie. When doing this the effects can sometimes be surprising especially when shape changing is part of the 'movie'. All the movies provided as examples can be run by selecting 'Matinee' from one of the drop down menus, in which any of your own movies will be included. Other drop down menus are used for file manipulation, editing, sound, screen mode and 'goodies'.

The 'goodies' provide a range of utilities that allow quick changes of the objects in the frame. On the more simple side, these include Zoom, Turn, Lean, Flip and Squash; for more complex movements a 3D perspective move can be carried out in the vertical and horizontal.

A utility program, Player, is also provide to create show disks that can be used without the need for the full Fantavision system.

Conclusion

The package comes on two 5 1/4" disks with a 68 page instruction manual. The second disk contains an extensive set of demonstration 'movies'. These range from a jumping angle-poise lamp to a swimmer attacked by a jaws lookalike. It is difficult to do justice to such a comprehensive and sophisticated piece of software. The uses to which it can be put are extensive particularly in the area of shop window advertising. Overall, it is a sophisticated addition to any would-be movie maker's software library.

L.K.

Price £65.00. Contact: Software Paradise, 2 Clive Chambers, Clive Street, Caerphilly, Mid Glamorgan, CF8 1GE. Tel: (0222) 887521.

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plete with a number of applications which make use of that 'window' feature. These are a calculator, notepad, calendar, clock and cardfile database. In addition the whole package comes with two larger applications, Windows Paint and Windows Write.

In order that Microsoft Windows can load into a 'window', other non-Microsoft applications, certain parameters need to be supplied. The parameters are held in Program Information Files (PIF). A large number are supplied as part of Microsoft Windows package for the more popular pieces of application software, eg 123, DBASE III etc. The package also includes a PIFEDIT program which will cater for the creation of a PIF file for any of the other less popular pieces of software.

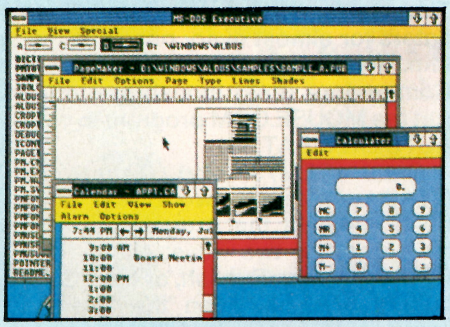
Digital Research - GEM

GEM has probably been around longer than the 'windows' concept itself, nevertheless it still belongs in that category of software. GEM implements some of the applications concurrently, the calculator, clock and snapshot (a screen grabber process), while for all other pieces of software it loads the package and restores itself to the machine when the application is ended. Due to this the GEM desktop needs to know little about the application it is to load, other than whether or not it requires parameters and what the parameter settings are to be.

Quarterdeck — DESQview

DESQview implements the 'window' concept in the same way as Microsoft Windows and provides concurrency and multiple screen windows. It does not however, provide any applications of its own and therefore it only provides the 'windows' operating system.

However, the package does include an interesting feature called LEARN, not directly related to the 'windows' concept. A LEARN program allows the system to memorise keystrokes as they are entered. These can then be replayed at the pressing of a single key. This can be used in a number of ways, eg the typing of your name and address or the typing of commands to the operating system.



Conclusion

So what is the use of 'windows' packages? If you need to see the results of two different processes on the screen at the same time, these packages will provide the mechanism by which it can be done. A more important feature and one that is not often stated, is that they provide a more user-friendly way of communicating with DOS. Programs can be run by simply pointing to the name or icon and then clicking on the mouse button; there is no need to remember the format of the DOS commands. For Microsoft Windows it is even easier for it is now possible to utilise touch screen technology as the pointing device.

What are the drawbacks? To run more than one program at the same time requires enough memory to accommodate both programs. In a standard PC the 512K available will not go very far; even when extended to 640K, packages like Lotus Freelance will require all of it. Therefore, any 'windows' package would have to resort to the load and return type of operation that GEM utilises. It is of course possible to extend the memory available up to quite a number of megabytes. However, this is quite expensive.

To get round this limitation some of the packages dump unused processes to disk until they need to be used again, at which time they are restored to memory. This leads on two another point, the packages will work on floppy disks and they usually require two of these, however, they are much more successful when used with a hard disk or card.

'Windows' packages will become more and more popular as the new ranges of PCs, the 286, 386 and latest 486 chip machines and IBM PS2 become cheaper. Indeed the PS2 is already supplied with Presentation Manager, which is IBMs 'windows' software. Of course who knows what effect the Transputer will have on this area, all in all it makes for an interesting subject and one which we will return to in future articles.

L.K.

Note: See *CCI* July for more information on Transputers.

Time For A Change

Mark Smiddy takes a look at a desktop publishing system - with more than a passing resemblance to Ventura - at an affordable price

For most people the idea of desktop publishing (DTP) is beyond reach, not just in terms of cost, but also in complexity. When we enter the world of DTP for the first time, or any publishing situation come to that, we are met with a barrage of hi-tech sounding terminology such as bullets, fonts and ems; it is almost like having to learn the operation of a computer from scratch again. Worse still, DTP is an area where computers like the Apple Macintosh have their toughest strongholds.

So, if you have nothing more than a simple PC where does that leave you? Principally you have three options: Ventura Publisher, the DTP leader on the PC; Aldus Pagemaker, ported from the Macintosh and needs Windows and a 286 to run comfortably; or Timeworks. Of these, the later two are expensive, powerful and slow. The third is cheap, easy to use and friendly; but still somewhat slow.

The reason for the lack of speed is simple: all serious DTP systems run under some sort of WIMP (window, icon, mouse, pointer) environment. WIMPs are graphic intensive operations and have a very high processor overhead. This means in effect, you need at least a 16 bit processor such as a 286 or even 386.

Fortunately, Digital Research's GEM was written with the 8088 in mind and remains perfectly useable on faster PCs like Commodore's PC10; Windows was not, and therefore looks very clumsy on the same system. However, since it does not affect Timeworks in the slightest it need not concern us. The machine used during this trial was a Commodore PC10 with 32Mb drive, monochrome EGA and Cameron serial mouse.

Getting Started

If you do not already have GEM/3, the first job after opening the packaging is to install it for your system; it comes on no less than six 360k floppies! With a hard card this only takes a few minutes; the whole system is done with simple multiple choice menus and it only takes a short time to have Timeworks up and running. GEM/3 caters for almost every possible system, however if you intend to use a Commodore (bus) mouse you must run the MOUSE.COM program in your AUTOEXEC.BAT.

Once GEM/3 and Timeworks (which comes on two disks) have been installed the program can be run in one of two ways: either from DOS - by typing Publish, or from GEM by double-clicking on the relevant icon.

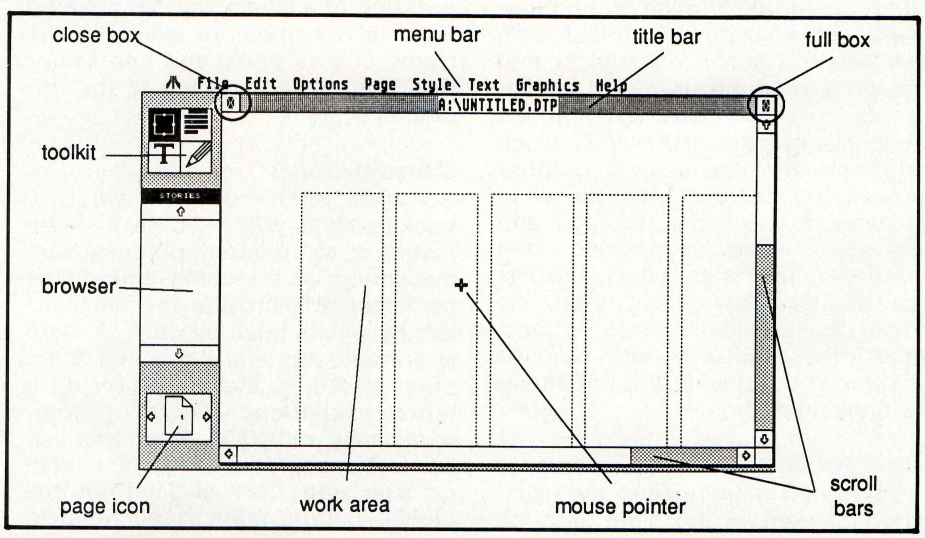
The program loads displaying the About Timeworks message; pressing return leaves you ready to start with the system in frame mode. It is here you will design the layout of your document.

To begin with though, before you even have to touch a menu, most of the commonly used functions are immediately accessible from on-screen gadgets. The main part of the screen is filled with the 1:1 window representation of part of your page. Just to the left of this lie three deceivingly simple gadgets: a mode selection tool; a browser; and a page selector.

The simplest is the Ventura-like page selector which can be clicked on to 'flip' through the pages of your document. Next there is the browser. This has many uses, but for the most part produces custom menus of: text or graphics files in memory; paragraph styles; even the graphics operations. Lastly is the most powerful of all - the mode selector. Timeworks has four specific modes: Text, where you enter or process text; Paragraph, where you set up the document's styles; Graphics, where you can use the graphics functions; and perhaps most used feature - Frames.

Frames define the boundaries for all which any text or graphics must fit. Some inferior systems (Fleet Street Publisher for instance) rely on the user to define separate text and graphics frames, Timeworks does this automatically making it much more user friend y - you draw the frame and decide what to put in it.

When the program loads for the first time it has a default A4 page with a predefined set of six frame - column



- guides. This is known as a style sheet. From here you can choose from four different paper sizes: US letter, 8.5' x 11'; US Note, 5.5' x 8.5'; US Legal, 8.5 x 14'; or A4, 210mm x 297mm. Also, you can define the number of frame guides - from 1 to 9 - and their dimensions.

With Timeworks, it is possible to define each individual page separately but this would become somewhat tiresome after a while and is very prone to error. The solution therefore is to create a page template or Master page. These pages can be all the same or defined as left and right styles and oriented as landscape or portrait. For most purposes, the defaults of Portrait and All pages alike, will be sufficient. Similarly, the Master page(s) can carry a banner - the title of your publication, for instance.

Another last stage in designing the master page(s) is to add the column frames; at this stage only the guides are in place. Most publications - like the one you are reading - stick to a particular format for each page. In CCI's case this happens to be three columns per page in most cases, with a portion at the top reserved for headlines and subheads. As experience has shown, this format is comfortable for most people so you would be wise to stick with it. Brave new layouts may look great - to you - but remember: beauty is very much in the eye of the beholder.

Once you are happy with the layout of your master page you can save it as a style sheet and continue to prepare your publication by selecting the first page. At this point, Timeworks fills in the page according to the master; defining a good master can save a lot of time at the production stage.

"The rest is simple: click inside the frame you want to work in — to make it active — select text operations, and start typing."

The rest is simple: click inside the frame you want to work in - to make it active - select text operations, and start typing. If you did not define any frames on the master now is the time to start. The active frame is highlighted by a set of small boxes arranged around its periphery. At any time you can resize the frame in any direction by grabbing one of these boxes and dragging the frame's outline. Normally, when frames are being sized vertically they are 'snapped' to the nearest column guide. This feature can be disabled if not required. Similarly, frames can be moved to any part of the page.

Preparing the Text

On the whole though, most people prefer to prepare their text off-line as it were, using a word processor

"If on the other hand you are stuck with ASCII, you can run into the proverbial problem of "What is standard ASCII anyway?"

where they can take advantage of features like spell checking and the thesaurus. Timeworks caters for a few popular word processors like Word Perfect, WordStar and GST's own 1st Word, but I suspect many users will find themselves confined to importing raw ASCII. Alternatively, if you can use 1st Word, for example, styles in the original document such as italics are interpreted correctly.

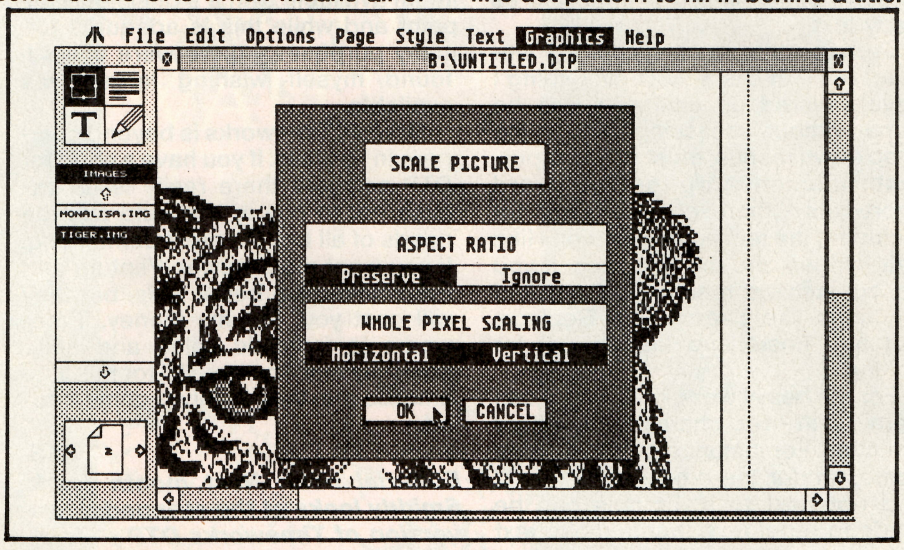
If on the other hand you are stuck with ASCII you can run into the proverbial problem of 'What is standard ASCII anyway?' Timeworks solves the problem by removing some of the CRs which means all of the paragraphs get blended together. The manual does give a few clues on how to remedy this and it amounts to very little extra work in the event. It is important to note, Timeworks tries to remove extra spaces so paragraphs will no longer be aligned and hyphens will become non-breaking characters; that is they will appear in the wrong place.

When text is imported into Timeworks it does not appear immediately, rather it joins a list of 'Stories.' This leaves you free to select which frame in which to place the text and to select the appropriate story from the list. If a story is too long to fit inside the frame (as is often the case) the bottom of the frame is 'dotted' to indicate overflow. The remedy is simple: define another frame - on another page if you need to - and reselect the story, when the remainder of the text is placed.

Graphics

A similar situation exists for graphics. Pictures can be imported in either GEM paint (.IMG) or GEM draw (.GEM) format as well as Lotus and PC paintbrush. The main difference being graphics are always scaled to fit the frame. The options for scaling all images include preservation of aspect ratio and .IMG files can even be cleaned up with the built-in graphics editor. Scaling does take a little time so picture frames can be hidden; in this case they appear as crossed boxes.

Staying with graphics for a moment, a feature of Timeworks worth a brief mention is its drawing ability. This is rudimentary to say the least and concerns itself with very simple shapes; it suffices for finishing touches. Filled areas are similarly unimaginative, relying entirely on the 36 fill styles available from GEM/3. On the whole though, filled areas are rarely required, except perhaps for a fine dot pattern to fill in behind a title.



Desk Top Publishing

Back to text: this is what DTP is all about and where the simplicity of Timeworks shows. Each paragraph in a Timeworks document can have a different style. There are four basic styles by default: Headline; Subhead; Body text; and Bullet. Headlines and subheadlines are straightforward enough, but what is a bullet?

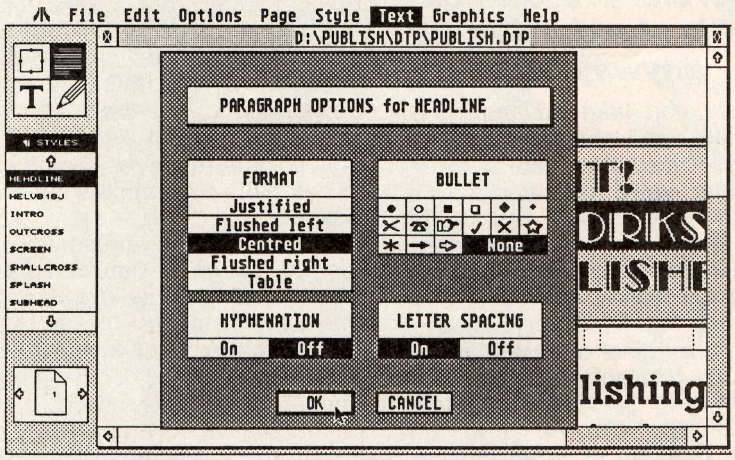
If you are new to DTP, the manual is a real help here for at the back there is a comprehensive list of some the stranger terms used by typesetters since time immemorial. A Bullet is a heavy dot or other symbol used as an ornament before a paragraph and in lists. It could even be a telephone

continued on page 38

continued from page 37

symbol to indicate your telephone number! Body text on the other hand, is simply the main body of text. For this you usually stick with one style to remain readable.

What makes Timeworks stand out is this: you simply select the paragraph tool; click on the paragraph you wish to change (this puts it into reverse video) and click the style you want. Double-clicking a particular style calls up a list of variables like



font and size, so you can easily create your own house styles or change the existing ones. All text is imported as body text.

Perhaps the most surprising element of all this is almost everything I have covered up until now can be done without accessing one of the drop down menus; most of the important functions are on keyboard short-cuts - there are 30 in all, not including the text editor functions like soft hyphen and fixed spaces. If you do consult the menus you will find functions like Search and Replace, Cut and Paste and that is just for editing...

For the heavy work, the system can Kern - shift - two characters in either direction. For instance the 'a' in Table comes under the crossbar of the 'T' and not next to it. Frames can be made to repel text, that is make text flow around them, so words can flow around a picture. To gain other effects, frames can also be made 'see through' without repelling text.

Results

The real proof of the DTP is in the printing and it is here where Timeworks falls over against its more expensive rivals. Printing speed is very slow, with a considerable amount of hard disk access going on all the time. The quality of the end result, however slow that it is, is though is, nothing less than superb.

The eventual results possible with Timeworks largely depend on the type of printer you have. The 9 pin Star used in the test produced perfectly acceptable results - especially when photocopied onto better quality (buff) paper. This could be used to great effect to produce customised menus for a small restaurant or just club posters; there is nothing to say Timeworks cannot be used to produce one or two page documents. It does so very well.

Using a better (24 pin or Laser) printer not only produces superior results but also can offer a much larger variety of font sizes. The maximum available with a 9 pin is only 36 point and while this is adequate for many purposes - there were times I found myself wishing larger was available.

Overall, Timeworks is beyond compare in its class. If you have a need for DTP software there really is no excuse not to buy it; it should suit the needs of all but the most demanding. If you want more power, Ventura and Pagemaker are better bets, but they will cost you. For my money, Timeworks is fantastic value and quite how they manage to sell it for this little amazes me. Very highly recommended.

M.S.

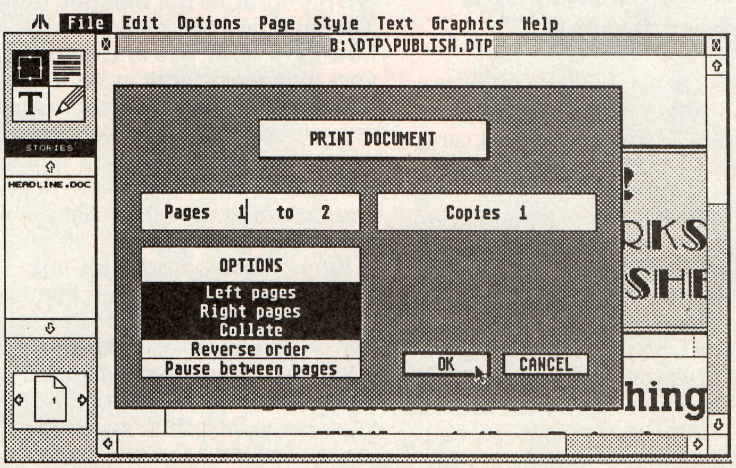
Editorial note: Next month Mark Smiddy looks at the stripped down version of Timeworks DTP - Timeworks Lite, which at under £50 looks like a bargain not to be missed.

Price: £99.00. Contact: Electric Distribution, 8 The Green Street, Willingham, Cambs. CB4 5JA. Tel: (0954) 61258.

What about GEM?

GEM was Digital Research's answer to the Macintosh WIMP system. Both systems, although rivals share many similar features - however Apple's is generally accepted to be the better one. Nevertheless, GEM is becoming an increasingly popular windowing environment for PC applications. It is the perfect user interface for DTP applications and many graphic applications; since it also appears (albeit in a stripped down version) on the Atari ST, this has made conversions between machines very simple. There are a few terms in GEM with which some of you may be unfamiliar:

Alert: A small box containing a warning or information.
Click: Press and release the left mouse button.
Disabled: Item on a menu which cannot be selected (appears shaded).
Double-click: A single click done twice in quick succession.
Drag: Move the mouse while holding the left button.
Gadget: Tool for moving or resizing a window, for instance.
Grab: Click and hold a gadget or slider.
Menu: List of items to select with the mouse.
Pointer: The on-screen sprite moved by the mouse.
Select: To position the pointer over a window and click.
Slider: A tool for altering the view inside a GEM window.
Window: Individual screen area for text and/or graphics.



Total Word

Integration is the wave of the future for business software. Len Keighley reviews an offering with DTP aspirations.

In the world of 'professional' PC software the move has been to integrate various packages into a single product. Notably there have been the spreadsheet, wordprocessing and database packages like Symphony. More recently these packages have begun to include graphics capabilities but none has combined the facilities of a new piece of software from Lifetree.

Lifetree have built on their earlier wordprocessing package, Volkswriter, to produce the integrated wordprocessor and desktop publishing product, Total Word. The package provides the flexibility and features of a word processor with the capability of producing text in various layouts with different embedded font usage.

Getting Started

Once loaded, Total Word displays a command screen that includes a file list of the current directory. You enter all commands with a single keystroke. After accessing an existing file, or creating a new one, the text edit screen is displayed. The bottom three lines of the screen display information about the file and in particular the line on which the cursor is situated. This includes the ruler and font settings. The display in the rest of the screen is dependent on pers al preference. It can be completely filled with a window on the text file or a reduced view of the text with various command key menus. Of course, the more experienced the user the less the command screens will be required. As each command key is used windows open up with the further selections available.

The different layouts are controlled by the use of 'Style Sheets'. These are assigned to the program by use of the file name extentions. Total Word comes with five of these already set up, these are:

.LTR — Letters and Correspondence
.MSS — Manuscripts
.NLR — Newsletters
.OHD — Overhead Transparencies
.RPT — Reports and Technical Documents

A new document will automatically be given the Style Sheet designated to the file extention. New Style Sheets can be created and assigned their own file extention. Whenever the same extention is used the new file will conform to the same layout.

Used in conjunction with the Style Sheets are Typestyles. These identify what form the text is to take when printed. Included in the parameters are the Font and character size details to be printed. A document can make use of any number of these Typestyles depending on how many different styles you wish the document to contain. The Typestyles provided as standard even extend to the provision of scientific equation fonts, which few other packages allow.

Facilities

The package contains all the usual facilities that we have come to expect of wordprocessing software. Total Word however, goes beyond this and adds in a number of unusual and useful extras. The spell checker includes a suggestion facility that will attempt to provide you with a selection of words based on your attempt at the spelling. The package also includes a Thesaurus which will give you a list of synonyms for the word you have entered.

To make things even easier the package allows for the setting up of abbreviations, so that if you use a particularly long phrase a number of times throughout your document, it can be typed in once and called up when required. This means that for the phrase 'as soon as possible' you only need to type 'asap' for it to be entered in the text.

Conclusion

Total Word is easy to use but unfortunately it is not a 'what you see is what you get (WYSIWYG)' word processor. However, this is understandable with all that has been packed into the program. All the extensive range of commands can be accessed with up to three or four key depressions and these are clearly shown in the four tutorials that are provided with the software.

The package comes on nine 5 1/4" disks or five 3 1/2" disks. The program cannot unfortunately be run from 5 1/4" floppies but can be run on two 3 1/2" 720K floppies. The most suitable way of course it to use a hard-disk drive the program will require 2Mb of space available.

Apart from the WYSIWYG aspect, the package ranks alongside the other popular wordprocessors of the moment. If you want different text presentations above the ability to link spreadsheets and databases with the text this package will be for you. In terms of word processing you will be missing nothing of the others.

L.K.

Price: £299.00. Available through most PC mail order and consumer retail outlets.

We can also insert special symbols by using the Alt-K, Alternate Keyboard feature. For example, we can have a trademark symbol, such as Total Word™.

We can also build scientific equations, such as the ones below:

$$\int \frac{dx}{\ell nx} = \ell n\ (\ell nx) + \sum_{1}^{\infty} \frac{(\ell nx)n}{nn!} \qquad \left\{ G_{\alpha\beta} = 8\pi T_{\alpha\beta} \right\}$$

$$^{2}H + {}^{3}H \longrightarrow {}^{4}He + n + 17.6\ MeV \qquad H_2SO_4 + Fe \longrightarrow FeSO_4 + H_2$$

DIGITALKER 128

Both you and your C128 will have something to say about this new programming aid. Bob Collyer has a little talk with his machine.

First things first: this is not a speech synthesiser, but rather like the pieces of clip art you find associated with graphics packages. Digitalker 128 is a utility that gives you pieces of digitized speech to patch into your Basic.8 or Basic.7 80 column programs; it is a set of machine language routines that play back digitized sound samples from within a program. Just think of the many applications such an aid could be used for. You can amaze both yourself and your friends with these little pieces of clip sound talking back to you from *within a program*.

This is the latest offering from Free Spirit Software, which must be the most prolific software house in the world producing programs written especially for the C128 in its 80 column mode. C128 readers of these pages must, by now, be familiar with their name and their quality products. The most successful Basic 8 graphics programming language utility is one of their best offerings.

Program specifications

This set of MC coded electrically recorded and digitized sounds is supported by both Basic.8 and the original Basic.7. Also supported are the RAM expansion units 1700 and the 1750. You may not own either of these RAM cartridges, but the sounds are so hungry for bytes, that to have several sounds in memory at once you will soon be reaching for one. At approximately 10K per sound, however, extra RAM is useful.

The two disks supply collections of digitized speech sounds created using an Amiga 2500, AudioMaster II software and the FutureSound sound digitizer. The Amiga IFF sounds were then re-written to a form that the C128 routines can handle, and then transferred from the Amiga to the C128. By using the Amiga 2500, Free Spirit Software were able to put its huge power to work optimizing the sounds for the C128, resulting in digitized sounds that are better than any that could ever be generated on a native mode C64 or C128 sound digitizer.

All in all there are five demonstration programs on the disks. Three are Basic 8 programs, and two are Basic 7. Some require a 1700 REU, while others will run on a plain old C128.

"Sound Off — 1,2 ..."

To begin these demonstrations, after auto-booting, a title screen presents you with a menu asking you to choose between Basic.7 or Basic.8. Even if you do not own Basic 8, you can still run the demo programs; a complete Basic 8 RunTime System is on the disk and will be loaded automatically.

The first volume of ClipSounds concentrates on some basic words and phrases, especially those that are most useful in a computer environment. First, the complete alphabet (A-Z) has been recorded. This is great for 'talking keyboards', and you will find two such demonstration programs for Basic.7, one for use with a REU, and another for standard 128K machine. There is also a complete set of numbers, and by combining them you can create any number up to 1 million.

Next, there are all 16 of the C128's colours recorded. Since DigiTalker only works in the 80 column fast mode, these colour names are a little different from the 40 column versions. There are words like *up, down, left* and *right. Top* and *bottom* is also available. Then you will find a wide array of computer terms such as *mouse, joystick, printer, paper, disk, diskdrive* and many others. There are also complete phrases such as *Press Any Key When Ready, Press The Left Mouse Button* or *I Could Not Find That File.*

BASIC 8

There are three Basic.8 programs on the disk. Two are games, while the other is a useful utility.

B8.15PUZZLE- This is a Talking version of the classic 15 puzzle game, using Basic 8's hires colour graphics and DigiTalker 128's speech routines. The result is a unique, entertaining and instructive demo. This program will run on any C128 and does not require a REU.

B.TALKMATCHGAME- This game requires a REU to be in place before you can begin. It is a graphic oriented version of concentration that uses a mouse(port 1) or joystick(port 2) as well as speech and accomodates from one to four players.

B8.ALTERSPD- This is a utility that can be used to listen to any sound on drives 8 or 9, and can be used to make the sound play faster or slower. You can then save this altered sound back to disk, replacing the old sounds from a backup copy of your ClipSound disk. ALTERSPD is useful to both Basic.8 and Basic.7 programmers, and it lets you change any sound.

BASIC 7

There are two Basic.7 demo programs the first speaks back the letter of the key on the keyboard which has been pressed; and the other requires a REU and is much the same, but includes all the numbers as well.

Digitising

When you are programming you have the choice of using either Basic 7 or 8 for inclusion of these digitized sounds. To use either is extremely simple. For Basic.8, the sound files used by the 'Talk' routine are stored in memory as special Basic.8 data structure files. Therefore, using the standard structure programming techniques, once a sound is in memory as a structure all you have to do to play the sound is issue a simple SYS command.

Programming the Digitalker in Basic.7 is fairly straightforward, but it does require more work on the part of the programmer. For the most part, this because Basic.7 has very little control over the REU; it is limited to SWAP,STASH and FETCH. Of course you do not need a REU to use Digitalker. However you are limited to the number of sounds you may have resident at any one time.

Conclusion

This program is a very good programming aid. I would like to think that more and more digitized words and sounds will become available as soon as possible on future ClipSound disks. It does seem to be the general idea and I hope that Free Spirit Software will continue to supply.

One, and only one, reservation is the massive amounts of RAM eaten up by the sounds. If you have not got a Ram Expansion Unit and like the idea of this program, then you will almost certainly need one.

B.C.

Price: $29.95 (US). Contact: Free Spirit Software, 58 Noble Street, KUTZTOWN, PA 19530.
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E.S.P. Tester

"What on earth does this thing do?" Some of you might already know, Bob Collyer explains.

There are those in the world that say they possess Extra Sensory Perception powers. Although we were not all born yesterday, we are supposed to be capable of a great

"What extra sense do these people have?"

level of understanding. Not everyone though has the same level; some people are more perceptive than others. Some people have better intellect, judgement or flair, which means that all minds are not the same and will never be, thank God.

It is easy to dismiss those people who say they have paranormal charms as a load of twaddle. Can we believe them though? Entertainers on stage have performed tricks or illusions to prove that they have this strange 'sixth sense'. Astrologers say that they can predict the future. Dowsers reckon that they can find water, metals or lay lines.

What extra sense do these people have? Why can't I tell the future? Why can't I find water with a divining rod? (*I can't even find a pen that I had in my hands just a minute ago!*). Can it be learned or can it even be tested so that there is conclusive proof? J.B.Rhine founded the Institute for Parapsychology in the USA and he developed a simple test to evaluate your individual powers of ESP.

Testing

The tests which he devised had three methods of evaluation for ESP. Firstly he used a unique pack of 25 cards made up from five symbols repeated five times in the pack. The symbols used are a Star, a Wavy Line, a Circle, A Plus Sign and a Box.

These tests were normally carried out using real cards and then at the end your results were written down and calculated by hand. So what





better way to put your computer to good use. Computers can do all this quickly, quietly and with no fuss. Your results can be calculated and a printout produced to keep for later evaluation.

Free Spirit Software have written disk based programs that will run on a C64 and also a better version that runs on a C128 in 80 columns using a 1351 mouse or joystick. It is encouraging to see that more new C128 native mode software is still being developed. Let's see how I get on with testing my own ESP.

Telepathy Test

The computer shuffles the deck to begin with and for the Telepathy Test I needed the help from another person, who better than my beloved wife Ros. (*She says she wants paying later*) One acts as the sender and the other acts as the receiver, the latter is the one being tested. The sender operates the computer, the screen displays one of the cards, the sender has to concentrate on this image. The receiver is situated so that he cannot see the screen and tries to visualise this image from the sender. His guess is put into the computer, and so on until the whole pack of 25 cards has been revealed.

On the law of averages you should be able to guess correctly five out of twenty. The more times you repeat the tests the more accurate you evaluation will be. This average is 20% accuracy.Proportionately above or below this average you can assess your chances of being able to predict the next card. Before I disclose my results let me describe the other two tests.

Clairvoyance Test

Here you operate the computer yourself as no other person is required. (*Time for the wife to make a cup of tea, I think.*) This test judges your ability to ascertain the order the cards are in after they have already been shuffled. All you do is predict the symbol of the next card and so on.

Precognition Test

Once again it is just you and the computer (*more tea*). This tests the subjects ability to accurately predict the order of the cards before the deck has been shuffled. After the shuffling then you can see just how close you were. This is the test that supposedly tests your ability to predict the future.







The instructions say that you must conduct the tests in a relaxed atmosphere with no distractions. You must also be interested and motivated as well as being confident. In this way you will obtain the best results.

Conclusion

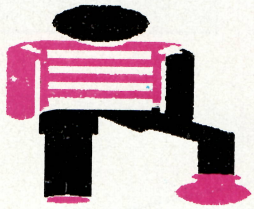
My results were as follows:

Telepathy:	**24%**
Clairvoyance:	**23%**
Precognition:	**21%**

All this goes to show that I got lucky a few times. Being a sceptic didn't help. I used to think I had Extra Sensory Perception, I once spent the night 250 miles away from home and when I telephoned home the next morning both my wife and I knew it was Wednesday! Good joke hey? I don't think I could even predict what time the nine o'clock news will come on. There is only one thing sure as eggs is eggs. If you think you may have these ESP powers then get them tested, just for fun.

B.C.

Price: $24.95 (U.S.). Contact: Free Spirit Software, P.O. Box 128, 58 Noble Street, Kutztown, PA 19530. Tel: (215) 683-5609.



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Back To Commodore Basics

Peter Gerrard continues his informative series with some basic Basic rules for all aspiring programmers.

Believe it or not, much of what I write is based upon feedback from readers, those rather important members of the public to which this magazine and others owe a considerable debt: there would be no magazine without readers to buy it, obviously. So, when I get a mini-deluge of letters all saying more or less the same thing, I pay attention. What are they saying? In essence, this: "I can understand HOW a command works, but I cannot understand WHY you use it." That's a fair comment. So for this month (and this month only, folks!) we will take a look a what I consider to be ten of the most important aspects of programming in Basic. That is, the 10 situations that are most commonly encountered, how the commands that deal with those situations work, and why they are used.

Number One: Printing Screen Info.

We will begin with the simplest thing of all, printing information on the screen. There is not much of a "why" about this one, just a "how". How do we print information onto the screen? We use the Basic keyword PRINT (usually! There's always a complication. We will look at another way later).

We could just type information, but that might produce a syntax error when we press RETURN key. This signals to the computer: "look at what has been typed and interpret it." If there is a number at the front, the 64 thinks it is a line number and treats it as such. But, if there is not, then it tries to make sense of it. It can only make sense if rational keywords have been used in a rational way. To you, typing in WATER IS WET might seem fairly sensible, but the 64 will have none of it and will greet you with a syntax error when you press the RETURN key. On the other hand, if you had told the computer to PRINT "WATER IS WET", it would happily respond and WATER IS WET would appear on the screen. If you had typed 10 PRINT "WATER IS WET" and pressed RETURN, nothing would happen. However, when you typed RUN <RETURN> (no more warnings about pressing the RETURN key from now on) the computer would again respond with WATER IS WET. We use the keyword PRINT, because that is the one the computer wants us to use. There is no why involved, it is one of the laws of computing life.

Number Two: Variables

We might not want to print straightforwards text all the time, though, and this is where situation two arises: varibles. There are basically two sorts of variables, which you might like to think of as little boxes into which information of one sort or another is stored. There are string variables, dealing with text or numbers, and there are numeric variables, dealing with numbers and numbers only. String variables are always suffixed with a dollar sign, so that A$ can readily be seen to be a string variable.

Computer equations must balance, so if we were to say A$= something, that something must be a string, either another string variable or command (see later) or something contained within quotation marks. A$="PETE" is a perfectly balanced equation. A$="1234" is also valid, as is B$="4321", but if you tried to mathematically add A$+B$ you would get the result "12344321". Strings are not added together mathematically, they are *concatenated*. However, if the numeric variable A=1234, and B=4321, the result of A+B would be the expected one: 5555.

There is another type of numeric variable, and this is termed an integer one. These have a % sign after them, as in A%=1234. Try defining A%=12,34, and PRINT A% to see what happens. This is why they are called integer variables: decimal points are not to their liking. So, try something like A%=12/5 and PRINT A%. A not altogether unexpected result.

There are rules regarding the names of computer variables, which I expect you know. They can be quite long, but only the first two letters of the name will be recognised by the 64. Thus FRED and FREDERICK are the same as far as the 64 goes. Try to use them as a variable name and you will discover a second rule: you cannot use ANY of the Basic words as part of a variable name, and within both FRED and FREDERICK we have the letters FRE. This, as the manuals tell us somewhere, is a Basic word.

There should be enough variable names for anyone, but can you have A$="PETE", A=12 all at the same time? Try it and see.

Number Three: Arrays

Situation three comes in from this. There are times when you want to use variables that are related to each other. Thus you might want to say A1=1, A2=2, A3=3, and so on. Because this takes up a lot of space and time, we use little things called *arrays*. The "why" of arrays is simple: they are easier to use than dozens of

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different variable names.

To use an array we must *dimension* it first, and the Basic keyword for that is DIM. So, if we have 64 different names to which we want to refer, we would DIM A$(64). Now the variable A$(23) would contain the 23rd name, and so on. However, never dimension an arry to be bigger than necessary, for whether you use all of the elements (as they are called) of the array or not, the 64 will set aside memory space for them and you will lose vital memory. You can have many arrays being used at once, as in DIM A$(64), B$(64), C(64), dimensioning both string and numeric arrays, but as I say, do be careful with memory. There is less of it than you think. Arrays can also be two-dimensional, as in DIM A%(8,8). This would be handy for looking after a square that was 8 by 8 smaller squares: a chess board is a familiar example. Then you could refere to A%(1,2) for part of the board.

So far, this is all good stuff, but it is about time the computer got to work. If it was incapable of making decisions for us it would be a pretty poor computer, so the fourth situation we will look at is one of the ways in which we can get the 64 to make a decision for us that will affect the way a program operates.

Number Four:

If we want the computer to make a decision, depending on various circumstances that might be in force at the time, the Basic keyword is, not surprisingly, IF. It is always associated with the keyword THEN, as well, so that statements take the form IF expression THEN do something. It is the "expression" and the "do something" that are the essential "whys" of this particular programming operation. We will look at a few examples, to try to make things a bit more clear.

```
IF 1=1 THEN PRINT "ONE IS EQUAL TO ONE"
```

This is obviously true, one is always equal to one, so in this case the computer would respond with the message that ONE IS EQUAL TO ONE. If a string variable A$="PETER" and another one B$="GERRARD", then:

```
IF A$=B$ THEN PRINT "A$ IS EQUAL TO B$"
```

In this case A$ most definitely does not equal B$, and so the expression would not be printed out and program execution would drop down to the next line. However, if we had said:

```
IF A$<>B$ THEN PRINT "A$ IS NOT EQUAL TO B$"
```

then the message would be printed out, as it is perfectly true that A$ is not equal to B$. In other words, IF the expression is true THEN do something about it. Program lines with masses of IFs and THENs in them can look quite scrappy, so hopefully somewhere else in the magazine an article on programming techniques will show you just one way of trying to eliminate them. Nevertheless, they are a powerful programming tool and should not be unjustly neglected.

Number Five: String Variable Commands

We cannot neglect situation five, which is all about string variable commands. We tend to use string variables more than any others, although there is no great reason for this. However, numerica variables are limited to numeric statements (adding them, dividing them, and so on), whereas strings can do none of this and have to be treated in other ways. The most usual things are concerned with taking portions of strings, the left side, the right side, and the bits in the middle, and the keywords for this are LEFT$, RIGHT$ and MID$ respectively. So, if A$="PETER", then LEFT$(A$,2) is equal to PE, RIGHT$(A$,2) is equal to ER, and the MID$(A$,2,3) is equal to ETE. Try playing about with these, to become familiar with them.

One thing that does make people ask "why have you done that?" concerns screen displays and the use of strings as opposed to numbers. If A=23, and I wanted to PRINT A; "IS EQUAL TO 23", it wouldn't look right. Too many spaces. So, we concert a number to a string by using the STR$ command. Why? Well, numbers are surrounded by superfluous spaces, so that if we PRINT MID$(STR$(A),2) we could eliminate all those spaces. We have converted A to a string (temporarily) and taken the mid-section of it, starting at the second character and taking everything that comes after that second character.

As ever, tery playing about with this technique to get the hang of the why, as opposed to the how. It just seems to be one of the features of Basics the world over that numbers have spaces strewn about everywhere, and certainly when we come to print them on the screen we want to get rid of those spaces. To convert a string to a number, use the VAL command, as in A=VAL(A$), where if A$="23" then A would equal 23 as well. Two useful, but oft-neglected, commands, are STR$ and VAL.

Number Six: Loops

Situation six takes us into the world of repeating actions, and here I must confess to an un-pardonable sin. Some computers have a myriad of ways of repeating things, but in real terms the 64 has just one: the FOR ... NEXT loop. Here is how it works:

```
FOR I=I TO 100:PRINT I:NEXT I
```

which will print out the numbers between 1 and 100. The FOR part starts things off and determines how many times we are going to repeat the statements between it and the corresponding NEXT statement. A FOR statement must ALWAYS have a NEXT statement somewhere along the way, otherwise disaster will ensue. Why use them? They save vast amounts of program space in examples that are more serious than the one given. Generally speaking, we have FOR variable=one value TO another value: go and do something: NEXT variable. And my un-pardonable sin? I do this so many times, when I know I should not. Look at this:

```
10 FOR I=1 TO 50
20 IF I=25 THEN 100
30 NEXT I:END
100 PRINT "WHAT THE DEVIL ARE YOU DOING HERE?!"
```

I have jumped out of the loop, and you should never do that. The 64 is a forgiving sort of soul, and doesn't mind you doing that every now and again, but do it too often and it will catch up with you for reasons that we will not go into here. It usually seems to happen in immensely long programs that are transferring control all over the place, and the program just breaks down and cries for no reason that you can see. Possibly, you have either jumped out of a loop or ignored situation seven, the transfer of program execution from one part of the program to another.

Number Seven: Program Execution

We saw an example just now, IF I=25 THEN 100, which implied THEN (GOTO) 100, where GOTO is the keyword for zooming off to line 100.

Why is it used?

Quite often you will want to move program execution from one part of the program to another. For example, if you were writing a small (very small!) adventure program, and lines 1000 to 1099 dealt with one verb, lines 1100 to 1199 for a second verb, and lines 1200 to 1299 coped with a third. If the variable VC held a value of one for the first verb, two for the second, three for the third, you might write

```
IF VB=1 THEN GOTO 1000
IF VB=2 THEN GOTO 1100
IF VB=3 THEN GOTO 1200
```

But far better to write ON VB GOTO

1000, 1100, 1200 — it takes much less space.

Sometimes, though instead of jumping to part of a program and leaving it to its fate, you want to go somewhere and come back again. This is where the other movement command, GOSUB, comes in. With a GOTO, you have to explicitly tell the program to GOTO somewhere else when it is finished, but a GOSUB can work it out for itself. It looks for a matching RETURN command (just like a FOR statement looks for a NEXT one), and when the program finds one it literally returns from whence it came. In this instance it goes to the statement immediately after the GOSUB, like this:

```
10 GOSUB 100:PRINT "I'M BACK!":END
100 REM I'M A SUBROUTINE
110 REM THAT DOESN'T DO MUCH
120 PRINT "I'M HERE NOW!"
130 RETURN
```

So the program goes off to line 100, prints the little message, then RETURNS to print the I'M BACK! part of things. Subroutines are much more useful when they are performing repetitive actions over and over again. As in our adventure game example, you might have an input routine where the user types in the next command. You would not want to have to type the whole thing out every time it might be needed, would you? Instead, if your input routine began at line 5000 you would just say GOSUB 5000 and be done with it.

AND/OR/POKE/PEEK

Now then, let us get a little bit trickier and meet situation eight. It, and situation nine, form the bulk of my "Confused of Hampshire" correspondence. Situation eight, ANDs and ORs. Situation nine, POKEs and PEEKs. We will take a peek at ANDs and ORs first of all, THEN GOTO POKEs and PEELs.

As I am sure you know, everyone of the 38911 bytes available on the 64 consists of eight bits. ((For bits make a nibble: I love these daft computer terms!) Just like an electric circuit, each bit can be turned off or on. So if all eight bits were turned on, we might write it like this:

1 1 1 1 1 1 1 1

If half were turned on, and half were turned off, we might have:

1 0 1 0 1 0 1 0

And if they were all turned off? Then we would have:

0 0 0 0 0 0 0 0

Now for the only complicated bit. You know that the highest number that you can POKE a byte with (byte, register, memory location, all the same thing) is 255. Why is that? Well, think of these eight bits again, and time for the binary mathematics lesson. Bit one has a value one if turned on, zero if turned off. Bit two has a value two if turned on, zero if turned off. Eit three has the value four if turned on, bit four has the value eight, and so we go on. One, two, four eight, 16, 32, 64, 128 are the values associated with eact bit. They all have the value zero if turned off. Anyway, add all those numbers up and you get ... fanfare of trumpets ... 255.

So, we can now work out what 10101010 would be equal to. In longhand and working from the right, as that is the convention, we get:

0 times 1 plus 1 times 2 plus 0 times 4 plus 1 times 8 plus 0 times 16 plus 1 times 32 plus 0 times 64 plus 1 times 128. Or:

2+8+32+128=170

Having grasped that we get to AND and OR. To give a positive example:

0 1 0 1 1 1 1 1
1 0 1 0 1 0 1 0 AND

0 0 0 0 1 0 1 0

In other words, if one bit is turned on in one byte AND the corresponding bit in the other byte is also turned on, then the resulting answer is also turned on. OR works in much the same way:

0 1 0 1 1 1 1 1
1 0 1 0 1 0 1 0 OR

1 1 1 1 1 1 1 1

That is, if the bit in the first byte is turned on, OR the bit in the second byte is turned on, then the resulting answer is also turned on.

That took longer than I thought, but I hope it makes things a bit clearer.

What it does mean, though, is that PEEKs and POKEs will have to wait until next time. Just when it is getting interesting, I hear you say! How do I know what to POKE where to achieve a particular result? Why do you POKE 631,13 and POKE 198,1? All good stuff, and all coming up next time along with situation ten, which was to be a discussion on user communications with the computer, or which commands allow the user to interface with the computer (spot of technical jargon for you there). So, until next month and a spot of PEEKing and POKEing around the delicate innards of the 64, au revoir!

P.G.

HANOI LISTING FOR PROGRAMMING TECHNIQUES NUMBER ONE

```
10 POKE 53281,0:POKE 53280,0:PRINT CHR$(147);:PRINT CHR$(158);
20 REM HANOI
30 REM FOR COMMODORE 64
40 DIM N(195)
50 INPUT "HOW MANY DISKS";H
60 PRINT CHR$(147)
70 REM PUT ON NEEDLE
80 N(0)=H:N(1)=1:N(2)=3:D=3
90 GOSUB 100:PRINT:PRINT "TOTAL MOVES =";MOVE:END
100 REM WELCOME TO MY SUBROUTINE
110 IF N(D-3)=0 THEN 230
120 REM OTHERWISE MOVE SMALLER PILE
130 N(D)=N(D-3)-1:N(D+1)=N(D-2)
140 N(D+2)=6-N(D-2)-N(D-1):D=D+3
```

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```
150 GOSUB 100
160 REM REMOVE REMAINING DISK
170 MOVE=MOVE+1:PRINT "MOVE";N(D-2);"TO";N(D-1);" ";
180 IF MOVE/3=INT(MOVE/3) THEN PRINT
190 REM REMOVE SMALLER PILE TO DESTINATION
200 N(D)=N(D-3)-1:N(D+1)=6-N(D-2)-N(D-1)
210 N(D+2)=N(D-1):D=D+3
220 GOSUB 100
230 D=D-3
240 RETURN
```

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key. If you are in the monitor then you need to press MM . You are then invited to insert the main menu disk in the drive once the menu is loaded you can then select the module that you want to load. If the load is selected the module name will REMAIN HIGHLIGHTED if you select the module name again when it is highlighted you will activate the module.

Also included on the disk is a program cruncher, this is fairly slow, but when you consider that a large program might be 200 blocks long, there is a lot of work for the program to do! I have saved twenty or thirty blocks using this program, but the results are very dependent on the type of data that you are trying to crunch.

The Rocket V2 is a fast disk turbo system. This is well worth the effort of loading, as it is fairly transparent in use. It speeds disk access up by about five or six times.

Conclusion

V4.2 IS a major upgrade and as such it is about twice the price of a normal upgrade. It seems to be a solid program that behaves itself very well, and it also seems to co-exist with many other programs without causing too many problems. I personally would like to see a few additions to the range of modules as well as a few improvements to the V4.2 software. It needs a hardcopy printout function for the instructions. It also needs a somewhat better startup sheet. It was a bit confusing the first time I tried to get the system up and running.

I would like to see a couple of additional modules, a GOOD basic programmers toolkit would be nice, a module that would enable the machine code programmer to put his own programs into the expert!, and if the expert hardware allows it, a means of using the expert in C128 mode!. Forget about buying another half baked game, the Expert V4.2 will be one of the best tenners that you will ever spend. ***A.E.***

Price: £9.99 (+£1.00 p&p). Contact: Now Computer Systems, 19, Beadon Road, Bromley, Kent BR2 9AS.

'Bugs' *by John Sladek*

(Macmillan £12.95)

John Sladek won the British Science Fiction award for best novel in 1983. He is also a humourist, a crime writer and, he says, a sceptical journalist. In 'Bugs', he has put all his talents to good use.

Manfred (Fred) Jones, with his wife, Susan, goes to America to publicise Fred's first novel, only to find his American agent has been conning him. Fred winds up broke in New York and Susan leaves him so, for reasons it would take to long to explain here, he decides to go to Minneapolis.

Applying for a job as a technical writer at Vimnut Industries he is mistaken for another M.E. Jones, who is a Jamaican software engineer and robotics expert, and he gets the job which should have gone to his namesake. That job is to help manufacture a robot.

Knowing nothing about robots, or computer languages, (asked about PASCAL he can only think of the French author), our Fred nevertheless manages to bluff his way around the program by reason of swotting up on computers and, by sheer chance, and a lot of conniving, manages to keep his associates unaware of his ignorance.

The robot, for it does get made, takes a fancy to Fred and treats him as the one human it can trust. Which is not surprising for the other people on the team are as weird a bunch of kooks as I've ever read about.

There is Melville Pratt, head of the robot 'Project M', who looks like Abraham Lincoln, talks like a demented philosopher and does, eventually, actually go crazy. But not before he manages to instill in the robot some of his own mad ideas which bring about his, and the robot's, downfall.

Another of Fred's co-workers is Carl Honks who dresses like a Chinese, wears a long mandarin beard and even longer fingernails and looks like 'the illustration for a Conan Doyle story of opium fiends in Limehouse. There is also the project manager, Sturges Fellini. Sturges' wife, Rain, falls for Fred but insists that he 'role-play' so, during their brief affair, he has to act like Michael Caine in 'Alfie'.

Fred falls for feminist Moira, another of his associates, but is himself targeted by KK, a beautiful Russian agent, who sounds exactly like Zsa Zsa Gabor and wants to discover the secrets of the project for her employers.

In between times Vimnut Industries changes its name constantly, Fred is just as constantly fired and re-hired, at an ever increasing salary and an ever higher company position, and he is bombarded with junk mail which offers him opportunities to claim cheques for enormous amounts for doing absolutely nothing.

On top of which, the other M.E. Jones turns up and Fred, suffering pangs of conscience over taking his job, employs him on the project. This, as you might expect, causes even more confusion.

Oh, and there is the robot itself, nicknamed 'Robinson', who, like its mad investor goes beserk and terrorises the neighbourhood.

I could have wished for a few less 'lists', (of things Fred finds in his dingy apartment, of the many aliases of a wanted man about whom the T.V. is constantly alerting the public), and several other similar kinds of statistics for I felt that they held up the narrative without contributing anything useful to the story.

Apart from that John Sladek has written a fast moving, funny, SF story that manages to ridicule many of the things in everyday life which, particularly in America, are part and parcel of daily living. But underneath the humour there runs a deep vein of iconoclasm. And the end is quite frightening. Read 'Bugs' and see.

D.M.

XYBOTS

Tengen

First there was Vindicators. Now Domark proudly present their second game on the Tengen label, Xybots. A futuristic (what a surprise!) split screen game where it's either kill or be killed. Two players can take part but you have to put up with the ridiculous names of "Captain Ace Gunn" and "Rock Hardy".

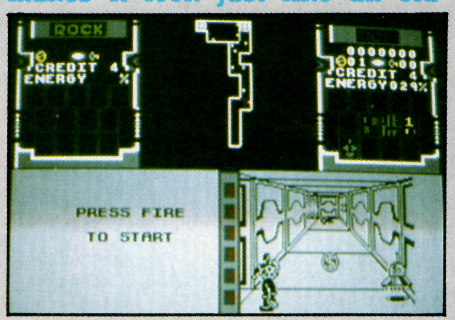
Your assignment is to explore the undergound complex and ultimately destroy the Master Xybot. The complex is made up of a number of mazes, each containing locked doors (which can be opened with keys) and transporters to advance to different areas. In each of the mazes lie hordes of deadly Xybot aliens ready to blast you to smitherines, but if you're quick on the draw you can get them first. You will also find energy pods, coins to buy extra supplies, and keys to open doors.

Half the screen is used for player one and the other for player two (if you are playing with a friend). On one player mode only half of the screen is used, which seems a bit of a waste but it was really designed for two players. To move your character through the mazes' corridors, push the joystick forward, backward, left and right in the usual way and press fire to shoot you laser gun. To use your stun gun, pull the joystick back and press the button. Be careful though because this reduces your energy level.

"The screen doesn't scroll, it just changes position each time you move."

The basic idea of the game follows that of Gauntlet, the main difference is that you don't view the action from above, but from behind your character in 3D. The screen doesn't scroll, it just changes position each time you move. This is a bit of a shame because it would have been far easier to see what is going on if it did.

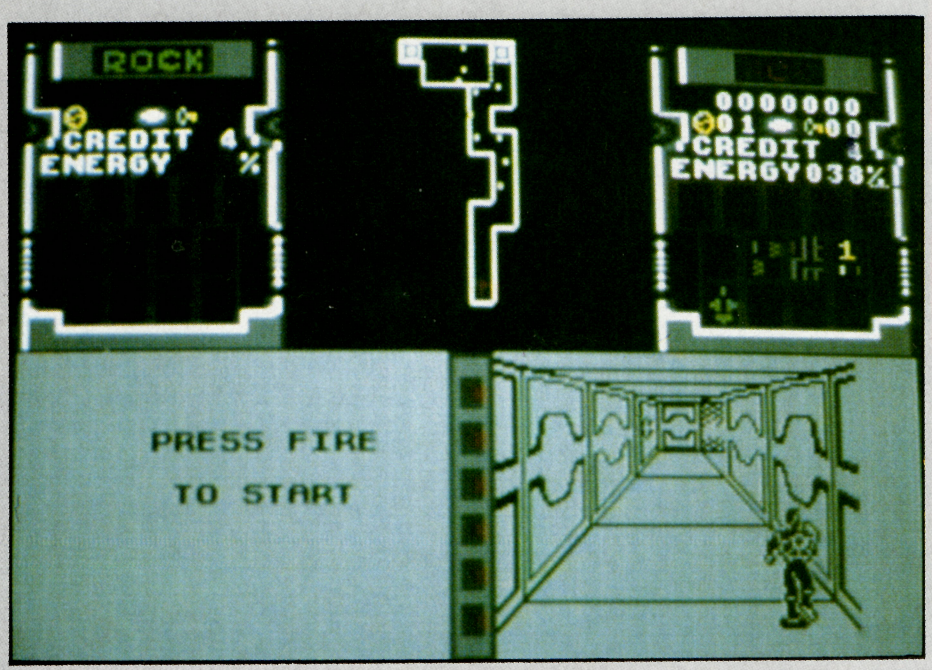
It's funny you know, I always thought I had a Commodore 64 — not a Spectrum! All the graphics have been drawn in boring black and white monochrome, which makes it look just like an old



Spectrum game I might have played a few years ago. As for the animation, this is hardly any better, with poorly defined enemy Xybots and unrealistic explosions which sound more like a cheering audience.

The game plays far too slowly for an action game, especially when more than one sprite appears on the screen, and wouldn't hold anyone's interest for more than ten minutes. I have played the Amiga version of Xybots and didn't really rate that too highly, but compared to the 64 version it looks like a masterpiece. I don't think even the most addicted arcade fan would enjoy playing Xybots for too long, and those who haven't played it will find it utterly boring.

D.H.



Graphics:	15%
Sound:	13%
Playability:	25%
Overall:	24%
Price:	£9.99(cass) £12.99 (disk)

FORGOTTEN WORLDS

Capcom/US Gold

Arcade junkies will know all about Forgotten Worlds; it is the unofficial sequel to Side Arms and just one in a fairly long list of Capcom coin-ops that US Gold have won the rights to convert. So far the Capcom conversions, with a few notable exceptions like LED Storm and Bionic Commando, haven't been all that much to write home about but Forgotten Worlds looks set to change all that.

Cast as a cool n' trendy hard guy with a pair of shades and a spiky Mohican haircut, you are set against the greatest adversary this part of the galaxy has ever seen. The Emperor Bios, God of Destruction has given birth to a fearful progeny: eight evil gods who are currently out and about destroying all known civilisation. The inhabitants of the cities they attack do not get a second chance. They are swiftly and efficiently exterminated; their cities left to turn into dust ruins which are becoming known throughout the galaxy as Forgotten Worlds.

As a mercenary, you have strong credentials, so you are the government's obvious choice. Without further ado, you are handed a bazooka and dispatched to the centre of the trouble zone. The hoizontally scrolling action is divided into four separate levels which can be tackled solo or as a two-player team. Aliens attack from all sides but luckily you are equipped with a jet pack that enables you to move practically anywhere around the screen.

There's a large selection of well-animated enemy sprites, ranging from robot spiders to deadly snakes and lizards. To make matters worse, most ruins are equipped with gun emplacements and have their own distinctive hazards. Hit one of the gas pipes in level one, for example, and it ruptures into deadly flames.

As in real life it's difficult to get anywhere without money. Certain aliens leave zenny coins behind when they're shot and it's up to you to pick them up before they scroll out of sight. At intervals, a weapons shop appears on screen; enter it and you get the chance to blow your savings. Merchandise includes homing missiles, lasers, flame throwers, v-cannon and boosters but the most effective are definitely napalm bombs (to burn out anything on the ground) and multi-directional fire.

The shopkeeper even gives advice on how to deal with levels further on. Make it to the end of a level and you are faced by one of the Emperor's demi-gods (on level four it's a confrontation with the dastardly Bios himself). The God of War and the dust dragon, a gigantic animated monster which practically fills the screen are among the most impressive. Graphics as colourful, well-



Forgotten facts...

Forgotten Worlds is based on the Capcom arcade machine of the same name. The original coin-op sports vast amounts of processing power. It comes equipped with three 68000 chips, three high speed crystals, sixteen 256K RAM chips,an 8039 for special effects and a Z80 for sound. That adds up to enough memory to digitise and play back a 25-30minute film. The programmers responsible for converting all this technology on to the 64 (and other formats) are a team called Arc Developments. Formerly attached to Elite, they've now set up their own company. Most of the Forgotten Worlds development took place on PCs by means of the PDS system. It was then sent to individual machines for testing. The gorgeous graphics come to you courtesy of an Amiga and a copy of Deluxe Paint II.



defined and spectacular as this don't often make it to the 64.

The Amiga version of Forgotten Worlds appeared a couple of months ago to high acclaim. It looked like a hard actto follow on the 64 but US Gold have come up with the goods. The graphics are impressively detailed and, despite obvious memory limitations, manage to recreate the atmosphere of the original coin-op.

Gameplaywise, the early levels are a touch more difficult to complete on your own than with a friend but as the action hots up you're glad of any help you can get. The rotating controls take a bit of getting used to but it doesn't take long to get the hang of them. The only real disappointment is the absence of any in-game music as good as the title tune.

Minor quibbles aside though, Forgotten Worlds has to be regarded as one of the slickest shoot 'em ups out this summer. Whether you're a fan of the arcade machine or just looking for a red hot blaster, there's plenty here to keep you entertained. *K.H.*



Graphics:	85%
Sound:	78%
Playability:	92%
Overall:	90%
Price:	£9.99(cass) £14.99 (disk)

FIRST STRIKE

Elite

A white blip appears upon the radar. As you bank right to line your guns up to the oncoming target, the on-board V.D.U. flashes telling of the exact form the enemy takes. An enemy radar field, a nuclear submarine and a whole squadron of enemy fighters are but a few of the hazards that you encounter at the controls of Elite's latest release ... First Strike.

Take to the skies as the pilot of an F16 fighter in a game that has more action than Falcon, but requires more thought than Hybris. It's not just a matter of pointing the guns and hitting the fire button!!!

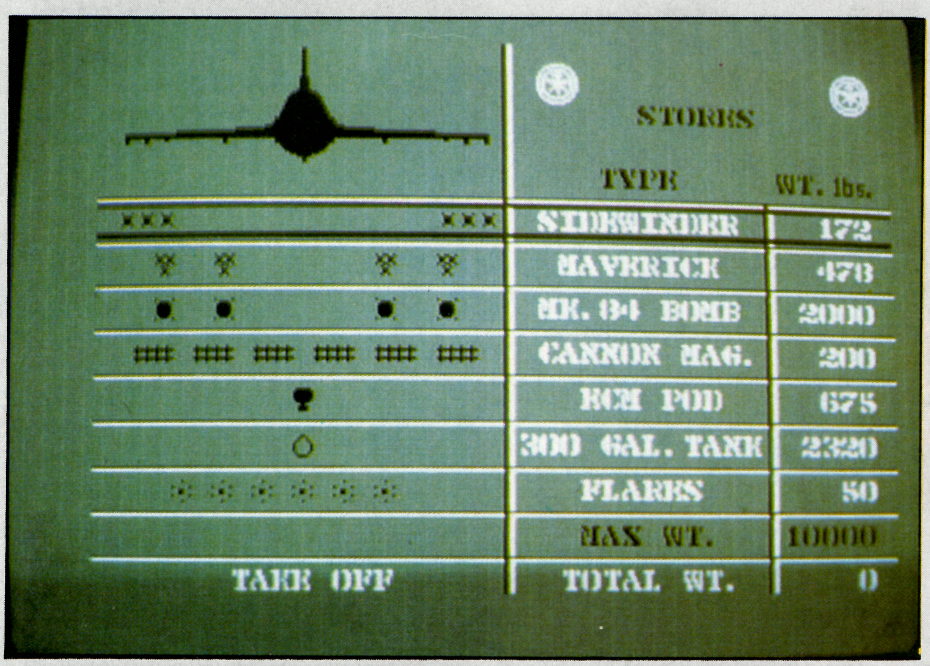
First Strike offers a selection of eight different missions; each takes place while air-borne over a different part of the globe. The danger packed missions require you to destroy an enemy target of strategic importance. Accuracy in blowing aside the oncoming targets is the key to success as a percentage is given depending on what you manage to destroy.

As the pilot, it is your job to choose which of the five possible styles of missile to take on the mission. Only experience in the air, shooting at enemy targets and in plane combat, will give you the knowledge necessary to decide upon which to take.

Sound effects are limited. The occasional roar of engines and exploding ships could of been better, and the initial tune playing throughout the loading screen is extremely irritating. The three dimensional flying, above and below cloud level add a sense of realism. With the varied attack sequences, which require the player to be on full alert at all times, you must be on the look out for the various decoys which are scatered throughout the flying space. I found the plance itself to be a bit slow in carrying out your commands, especially when in the pursuit of enemy fighters.

Generally, First Strike is worth a look if you enjoy the thought provoking strategical moves of Falcon, alongside the option of causing some carnage within the enemy's ranks. The price makes the game even more appealing.

S.P.



Graphics:	79%
Sound:	50%
Playability:	85%
Overall:	80%
Price:	£9.99 (cass)
	£11.99 (disk)

Adventure

BY ANDY MOSS

WELCOME HEROES ONE AND ALL TO ANOTHER FEAST OF ADVENTURE, IN ALL ITS MANY FORMS. IF YOU ARE A ROLE PLAYER COME, LAY DOWN YOUR TRUSTY SWORD AND TALK AWHILE, IF YOU ARE A PUZZLE SOLVER, SIT AND REST YOUR WEARY HEAD. THERE IS NO FIGHTING TO BE DONE HERE, NO QUESTS TO TAKE AND NO HIDDEN MAZES. JUST YOU AND I AND MAYBE SOME ENLIGHTENMENT. TAKE HEED AND MARK MY WORDS WELL, FOR THERE ARE THOSE THAT CARE NOT FOR KNOWLEDGE OF ANY KIND. SO BE IT , LET THEM STEW IN THEIR ALOOFNESS, FOR WE KNOW BETTER, DON'T WE....

COMMENT

After last months mega reviews I thought I could settle back and wallow in the glow of a job well done. It was not to be I am glad to say as the continuing adventure glut crashes on. This month sees the unveiling (finally) of DEJA VU II, a worthy successor to Ace Hardings last outing, the cheat program I promised you DUNGEON MASTER EDITOR, and EA's FIRE KING. Not forgetting of course the latest installment of BARDS TALE II solution.

But first I want to officially put paid to the rumours flying around the industry that Infocom have gone bust. What in effect has happened is that they have moved from Boston to join Activision's headquarters in California. Obviously moving from coast to coast hasnt suited many of the full timers so what they are doing is working from home using the latest state of the art modem equipment. Dave Lebling is hard at work on his new project, Brian Moriarty is also penning a new creation (see news section) and just the management have relocated to the West Coast,- so all in all Infocom is far from finished. Activision see it as gathering all the clan under one roof, and as the lease was up for renewal at greatly increased rent in Cambridge Mass, Infocom went west.....literally!

ADVENTURE NEWSDESK

THE END OF ACL?

Following their successful awards evening at the Sherlock Holmes Hotel in London, it seems that The Adventurers' Club run by Henry Mueller has folded. The whole episode is shrouded in mystery as members have phoned their usual number to be greeted by silence, Henry seemingly has vanished. Unfortunately, there are a number of recently paid up members who are expecting their regular newsletter, not to mention the hundreds of existing members who have been left high and dry. This is just not good enough, and has tainted what has been up to now a well run professional outfit. Henry, if you are reading this, at least send me a note to publish, to tell your side of the story, and explain whether or not your fellow adventurers will get their money back. How about it?

LUCASFILMS GETS INFOCOM MAN

Brian (Beyond Zork) Moriarty has just finished LOOM for Lucasfilm, and is billed as a fantasy adventure set in the land of the Great Guilds. It has a hero called Bobbin and comes complete with a half hour audio tape professionally recorded using a cast of seven actors. Moriarty feels that the tape will replace the now standard 'novella' that tends to come with adventures nowdays, and will provide a realistic scenario for the player to truly become involved in the story. US Gold will of course be releasing the product, around Autumn time methinks.

RAINBOW ISLANDS

The sequel to Firebird's Bubble Bobble Rainbow Islands is to be released soon. Many years have passed since the adventures of Bub and Bob who were given the power of the 'Magic Rainbow' by their parents. Now older and wiser they are returning to their birthplace to search for treasures. After a long and arduous journey they have to face the' Prince of Darkness' and his many secrets and puzzles.

ACTIVISION BIGGIES QUEUE UP

There are some meaty titles waiting in the wings at Activision. MANHUNTER SAN FRANCISCO,

CONQUERERS OF CAMELOT, KINGS QUEST VI are just a few of the glittering array of biggies that await us in the New Year. Can I wait? Well in the mean time I will have to put up with this next batch.....

ACCOLADE LINE UP A TRIO

Three new adventures are planned by Accolade, now that they have finally set up over here. CONSPIRACY: THE DEADLOCK FILES, is a first person graphic adventure which pitches you into New York's streets as an unwitting witness to a plot to overthrow the US government. You must scour the streets to find the seven Deadlock Files and prove your innocence. Television like quality is promised along with suspense and depth.

THE THIRD COURIER is high tech espionage in East and West Berlin. You are Moondancer, the best secret agent in the free world. You have to recapture NATO plans, that have been stolen to be sold to Russia. A new type of role playing is promised with infinite scenarios and great music.

DON'T GO ALONE is a mystery role player which has you creating an expert team of ghost hunters to journey into a house that cost your grandfather his sanity.

All due out in the Autumn.

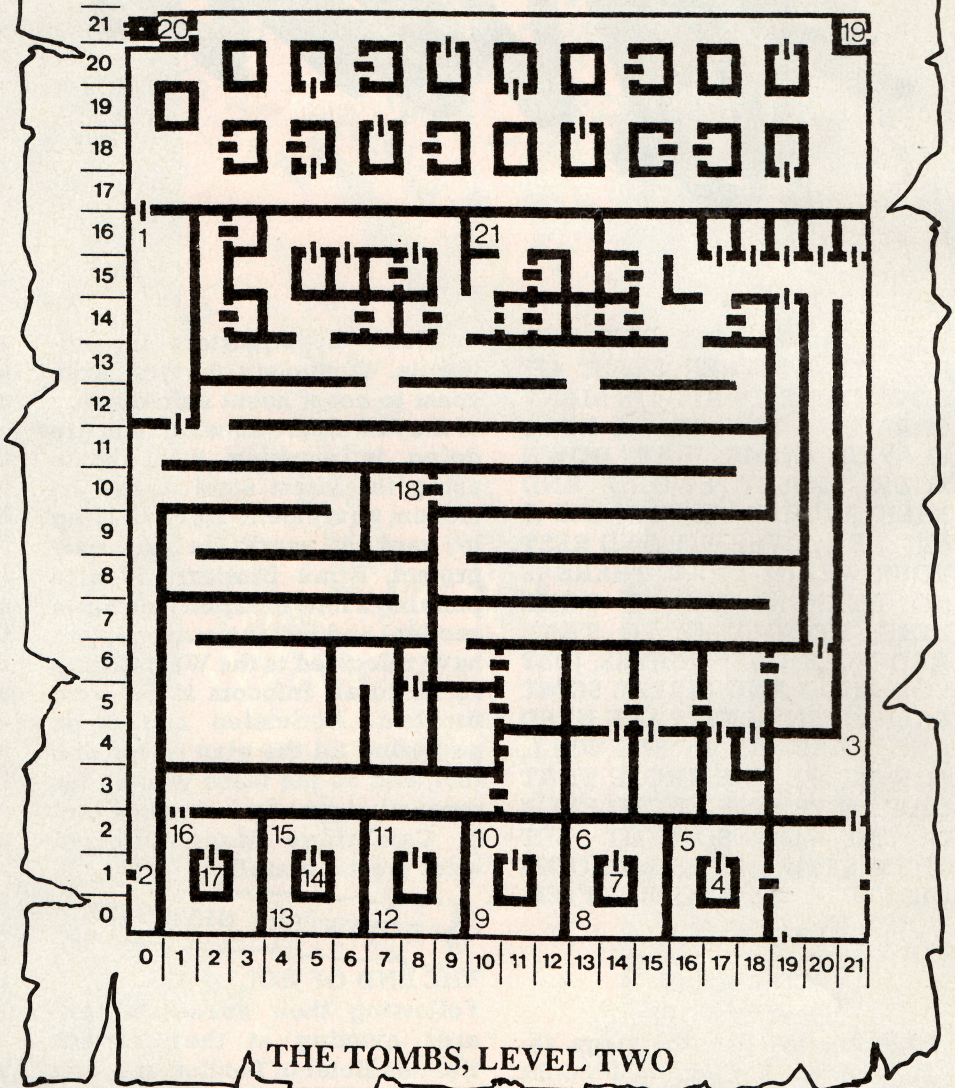
DELTA 4 IS DROPPED BY ACTIVISION

Remember at the beginning of the year, I interviewed Fergus Mcneill of Delta 4 and had a look at PARISIEN NIGHTS? News has come to me that although the game was more or less finished, and looked pretty impressive in my opinion, Activision have decided to abandon the project and for that matter any future plans with Fergus. Everyone is rather tight lipped on the subject, but I hope that at some time we will see the work revealed.

NEW FANZINE FROM PROBE

Adventure Prober Mandy Rodrigues has published a new mag for serious adventure writers called ADVENTURE CODER. Edited by Chris Hester, Coder aims to give in depth information on what can really be acheived with adventure writing utilities like GAC and PAW, and gives many hints on how to write good adventures. The first issue is out now and is recommended along with its stable mate ADVENTURE PROBE for the real enthusiast. For more details, write to Adventure Coder at 3 West Lane Basildon near Shipley, West Yorkshire BD17 5HD England

THE BARDS TALE II SOLUTION PART SIX



THE TOMBS, LEVEL TWO

THE TOMBS LEVEL TWO.....

1. A deadly room of traps! and nothing of any value inside! If it becomes necessary to come here again I pray we next time we use magic. 2) More wraparound magic then explore north. 3) Another magic mouth that says 'THE TEST OF TIME HAS LAID WASTE THE POWER OF THE TRUE WAND. ONLY THE ONE CAN SAVE IT, YET AT A COST OF LOSING HIS OLD SELF' At last! A clue about the Destiny Wand. We are all elated. We decide to explore south 4) and find a message scratched on the wall of a small room within a room 'THE GREAT T HAD AT THE END OF THINGS TO BEG WITH A KIND WORD'. More searching uncovered a teleport(5) that led to another message, 'HE WAS TOLD TO BURN AND THEN KNEW A MULTIDUDE OF SOLUTIONS'. I know not what all this means but felt that Andreas was working on it. Many teleports later we came to small rooms and windy passages (18) then came across an old man who wanted to sell us an item for 50000 gold pieces. Andreas felt we should kill him, but wisely as it turned out I pooled our gold and paid for his item, which turned out to be a key. We stored it away and continued north 19.

Another message, and at (21)

some stairs leading down. We rested here and then continued down to the next level of the tombs.....TO BE CONTINUED.

MORE ON JOE DEVER'S PHONEQUEST

I talked to Joe Dever on the phone last week, and he filled me in on just what is making Phonequest tick. Fortress of Doom is the first in a series of adventures, that really took shape last January. He had been playing Steve Jacksons FIST phone game and felt the process could be improved by better scripting and classier production. He met up , quite by chance with a top US audio text programmer who had perfected a voice recognition system and an instant character storage routine. This did away with the cumbersome key pressing for commands, and enabled the player to interact with the game just by speaking a number. The storage routine proved invaluable for Time Freeze, which lets the player keep his character saved for up to one month. After finding a telephone information company who were keen to start a competitive game to FIST, Joe recorded for two weeks using narrator Edward De Souza and transferred the tapes onto a digital system for storage on a 386 series Compaq computer using a 1.2 megabyte hard drive. The system is now bug free and up and running, with thousands of players already experiencing the Lone Wolf adventure. I played for about 25 minutes, and can tell you that the adventure very well written and quick to play. The voice system worked perfectly, and I found myself mapping this new world with ease. It is expensive as the charge for the call is around 38p a minute, however Joe is in talks with BT to try and get a fixed total amount that cannot go higher than £3.50.

Try the game for yourself 0898 400 341

Let me know what you think, as there are prizes to be won, can you win?

ADVENTURE MAILBAG

Quite a bit in the mailbag this month, from all parts of the world, the first letter though is close to home and brings help to a stranded adventurer who wrote last month.

Dear Andy,

I have the answers to Bjorn Guillots Ultima V problems. To get the crown he must go to the roof of Blackthornes castle where he will find a magically locked door. The crown is behind it. He will need to get past the gargoyles (run away) and use either an unlock spell or a skull key from the serpents kitchen. As for the Mage in Scara Brae, ask him about the Oppression and when he asks for the traitors name say ANNON.

Can you tell me if there are going to be any more Alternate Realities?

Best wishes, Fiona Bissett, London

Good to talk to you again Fiona, and thanks for those tips. I am sure Bjorn will appreciate the help. As far as Alternate Reality is concerned, there has been another edition in the States, but as far as I know no publisher over here is marketing it anymore. US Gold and Grandslam both at one time have had a go with it but were never convinced of its saleability.

A.M.

Dear Andy,

Knowing what a great adventurer you are I am going to ask your advice on my problem. I would like to become an adventure programmer (without using GAC or Quill etc) and I have seen some books which help you to do that. they are Adventure Gamewriters Handbook by L English, Exploring Adventures by P Gerrard, Further Adventures on your 64 by P Gerrard. Which is the best one and where in London can I buy it?

Kobina Graham, Ghana

My My, it seems there are adventure players all over the world, and I am honored that we have readers in Africa. To answer your question Kobina look no further than CCI's *own Peter Gerrard, who has written many articles in the mag about adventure programming, and as two of the three books you mentioned are by Pete I strongly suggest you buy those. As to where to get them, I would try PILOT SOFTWARE in Rathbone Street W1, who always stock a large amount of interesting books and games.*

A.M.

Dear Andy

In your March issue a bloke named Jerry Mitchell reckons he can give a bit of a hand in the game Eternal Dagger. I'm in a bit of a fix with the Tower Of Avlis. I cant get out or finish this bit as the doors to the south on the top floor wont open. Thanks mate for the Starcross map back in December it was a great help. You're a flamin marvell, don't stop what yer doing mate.

Your cob, Will from Oz

Thanks mate, you are a real ripper for that. Jerry, are you reading this, my mucker Will here is in dire need of your help. Come on mate, lets have the answer!

A.M.

Dear Andy

Since I have had Bards III longer than anyone in the UK I decided to help get some people started.

First create your own party

1. You should have 2 of either Minks, Warriors Paladins or Hunters. You should also have 2 magic users 1 rogue and 1 Bard.
2. After creating your party,look for the tavern in the forest. If you have not fought some one you must do so. Now you can buy a drink at the tavern,
3. Exit the bar and find the ruins of Skara Brae
4. Enter the city and just move forward into a building and take everything thats there.
5. 4 paces north and 14 paces East of the gates is the boardroom. Enter and visit the old man.
6. Go to the temple of Tarjan 2 paces N 10 paces E and say TARJAN
7. go through the dungeons to the doors go through to the stairs and look for the word CHAOS.
8. Go back up and return to the boardroom where you will get

advanced.
Michael Lewin, Canada

ADVENTURE REVIEWS

DEJA VU II ▶
MINDSCAPE AMIGA

Once again as Ace Harding you are out to clear your name. Remember in the original adventure you woke up not knowing your name or where you were, but just that the police are after you for murder. Deja II starts off with you waking up again, only this time its after a bout of whiskey drinking! You are in Las Vegas, having been abducted from Chicago by two of Tony Malones thugs. He feels you are responsible for a missing 100,000 dollars that Joey Seigal (the one who was murdered in the original) was to give him . Malone has given you one week to come up with the money or POW its all over for you. The same system is used as before with objects able to be dragged over into your inventory, and touching objects to examine them etc. Very little text is needed, as most of the clues are in the pictures. Quite a complicated plot that has you travelling back to Chicago to seek out the truth. A nice twist at the end though guarantees your money's worth.
PERSONAL RATING..... 9

DUNGEONMASTER EDITOR
EDWARD PENMAN/SOFTEX

This fascinating program allows you to play around with the actual dungeon make up of Dungeonmaster without it really harming your enjoyment. All the doors can be unlocked or turned into gates, walls can be removed, and hidden doors can all be revealed. You can get a print out of each level, and even remove every wall if you want to! All you need is a previously saved game, which after loading in the editor you can change around using the editors simple menu system. Once you have finished delving, you save your handiwork reload the main game and boot in your new saved disc. Edward Pennman who wrote the program is a Dungeom Master expert, who knows every nook and cranny of each dungeon. He demonstrated the editor to me and took me through level 13, in the main game and I can tell you his fingers were a blurr over the keyboard. As a master player, he feels his editor is a useful tool for players who have finished the game proper and want a new challenge(designing new dungeons) or for fustrated gamers it releases them from their mess. All Mirrorsoft who market Dungeonmaster in this country will say on the matter is 'NO COMMENT'. I think it is fascinating.
Contact: SOFTEX 212-213 BROAD STREET, BIRMINGHAM B15 2JP ENGLAND

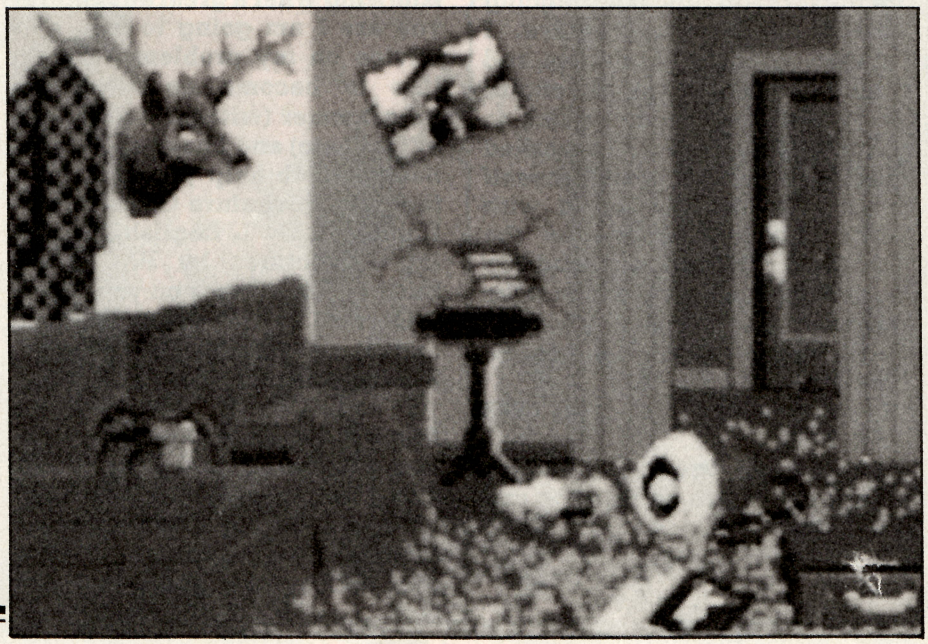


FIRE KING ▼
ELECTRONIC ARTS/SSG C64

This could at first glance be almost mistaken for a Gauntlet clone, until you realise that underneath the seemingly arcade type presentation, there lurks almost a real Dand D story. It is a cross between Gauntlet and dare I say it Ultima, in that the puzzles are tricky, the magic is necessary and the fighting non stop. What lays before you is a huge 3d continent of forests temples and dungeons combined with a multitude of monsters. At the start you get a choice of six heroes (two players can play at once if you wish) with all the trappings of traditional role playing in an easy to master graphical arcade style. You get maps, mystical cyphers and two double sided discs. Better known for their wargames, SSG have come up with a very entertaining piece of software. Its quick, carries a splendid manual that even has an opening walkthrough for novices. Try out Fire King, its very morish.
PERSONAL RATING.....7

THATS IT FOR ANOTHER MONTH, LOOK OUT FOR A REVIEW OF INFOCOM'S ARTHUR IN THE NEXT ISSUE, SEE YOU THEN.

A.M.



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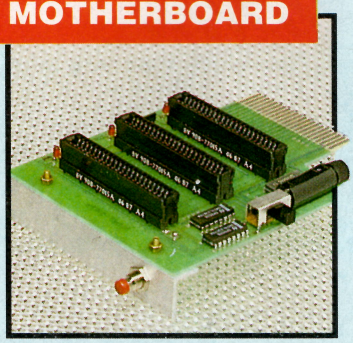

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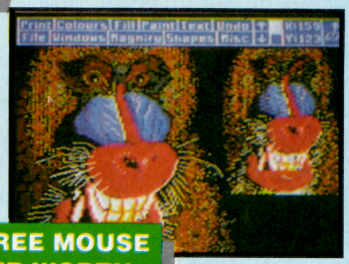

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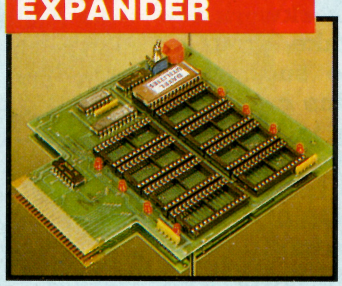

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Indiana Jones and the Last Crusade



US Gold

Indiana Jones and the Last Crusade is already a multi-million dollar box office hit. The third film chronicling the daring escapades of the intrepid Indy (Harrison Ford), this time accompanied by his father (Sean Connery) has captured the imagination of film-goers all over the world.

It's a measure of just how big a success everyone knew the film would be that when US Gold acquired the licence from Lucasfilm in America, the deal covered not just one Indy tie-in but two: an action game and an adventure program. This is the action game; unlike the Indy adventure, which was developed in the USA, it was programmed in the UK by Tiertex.

The game is divided into four different levels. Each stage involves searching a maze of platforms for a hidden artefact and then surviving long enough to bring it out of the labyrinth. First off comes a network of caves connected by ropes and precarious bridges. Indians and treasure hunters throw tomahawks and fire bullets, while energy-draining stalactites fall from the ceiling. Unless you collect all the torches you may find yourself dying in the dark.

Having escaped from the caves over the top of a moving train carrying dangerous animals, the quest moves on to the catacombs. Lightning, falling brickwork and dangerous rats make progress difficult; if you do succeed in finding the Byzantine crusader's shield, you'll have to scale the castle wall to safety.

Stage three sees Indy searching for his father's Grail diary on an airship. It's important to pick up the passes; otherwise the authorities will raise the alarm. Meanwhile, Dr Jones Senior has been shot. His only hope is for Indy to recover the Holy Grail in time to heal him. If he manages to survive all the traps and pitfalls set by the crusaders, The Last Crusade is over and Indy's questis won.

It was always likely that the Indy action game wouldn't quite match up to the top class standards of the Lucasfilm adventure game (also about to be released). And as platform games go, this one just misses out on the variety of screens and enemies which create the superior standards of the Amiga version.

On the other hand, four complex levels of jumping, searching and firing make for some entertaining gameplay, especially if you're a big fan of the film. The graphics are neat and the action is accessible - in fact, the only major disappointment is the sound- so if you enjoy platform games, you'll get plenty of fun out this.

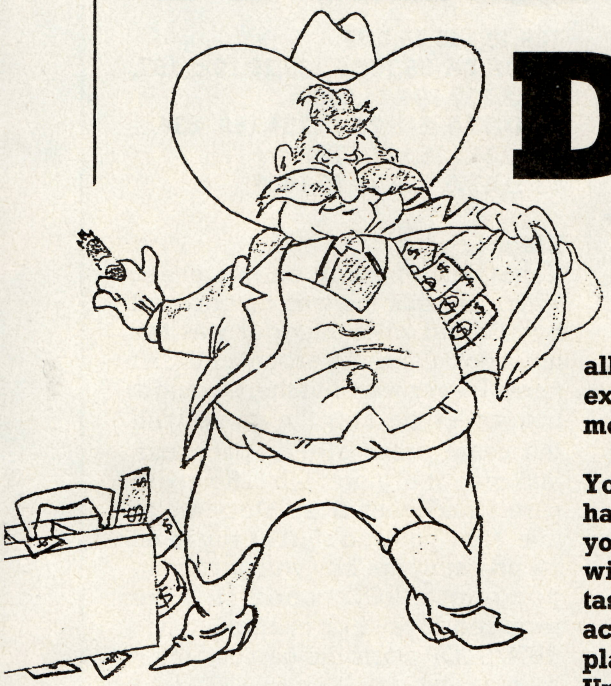
Graphics:	68%
Sound:	52%
Playability:	70%
Overall:	69%
Price:	£9.99 (cass)
	£14.99 (disk)

"Rats – take two ..."

In addition to the stars, Steven Spielberg employed a whole menagerie of animal extras for the making of The Last Crusade. The final roll-call included hundreds of snakes and 8,000 rats. After each take in the sewers, the rats were dried with hair-driers and sawdust.

WHEEL & DEAL

Free Spirit Software



If you are a budding businessman and you think you can live life in the fast lane making lots of money, Free Spirit Software have a very special treat in store for you. Here is a game which has been written especially for the C128 in 80 column mode.....yes! *The C128 in 80 column mode!*

The idea behind the game is simple and is nothing new. It is something like the traditional board game Monopoly, one of the all time greats; the object of the exercise is to make loads of money.

The game is for 2 to 4 players. Your dear old Uncle Humphrey has died and he has left each of you $25,000 to start with and do with whatever you see fit. The task you have been set is to accumulate $100,000. The first player to do so gets to inherit Uncle Humphrey's entire estate, but watch out! You'll lose if you become bankrupt.

After the little introductory screen and music the game gets underway offering each player in turn a decision to make. There are several choices.

The player's name and present cash assets are displayed at the top of the screen. You may have ended up at a piece of property. You have the choice to buy or rent. If your opponent lands on your property later you can claim your rent from him. As in the real world some people may try to evade paying rent and the tennant may even try to take the landlord to court.

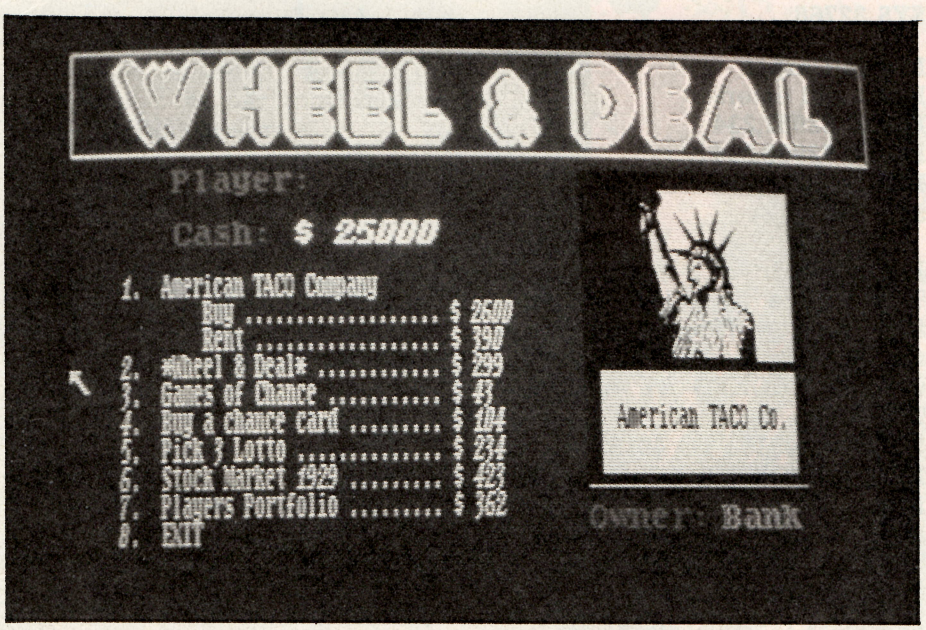
Every move you make will cost you money. As the idea is to make money not spend it, there are several options open to you each move, excepting where you have been stung for a tax audit or indeed if you have been given money, as sometimes happens randomly throughout the game.

The options are listed each with their costs set out beside them, these choices are: 1). Games of Chance. Here you could put some of your money either on the roll of the dice or play the ponies. You have no animated graphics for the horses only a little hoof pounding sound. 2). Buy a Chance Card. As it sounds, you could end up winning or losing at the turn of a card. 3). Pick 3 Lotto.

You pick a number between 0-999 and although the odds are high you could win a million bucks and of course the game! 4). Stockmarket 1929. This is my favourite way of making money. Choose to buy into the market when prices are low. Watch a day's trading take place. Then at the close watch to see if your shares have increased in value. This is a very good way to make or lose a fortune quickly.

The game graphics are somewhat basic when you consider the power of the C128, and the rather simple music score also poorely reflects what the SID chip is easily capable of. Good graphics and great music are now the standard for most C64 games these days so why can't C128 owners be treated to a product that uses the parts C64 games cannot reach? After all is said and done though, Wheel and Deal is fun to play, nevertheless.

B.C.



Graphics:	30%
Sound:	20%
Playability:	50%
Overall:	40%
Price:	$29.95 (U.S.)

HORGAN'S HINTS

So you do read these intros after all! I was beginning to think I was talking to myself. I know it can be hard not to dive straight into the pokes, but what if, in the confusion, you miss out on a truly splendiferous cheat? Well, there's no chance of such a calamity if we all act as adults. So I'll thank you kindly for your mature attitude, and credit the first lot of pokes to Barfie and Goody, two of Rotheham's rising stars, who are in line for this month's freebie selection.

64

Bubble Bobble
Try these two for some wacky effects. No restart address I'm afraid, but if you've got a handy cartridge, why not load and reset before entering:
POKE 7076,70 (player one gets lives and points when you burst a bubble)
POKE 8975,70 (both players turn into your enemy when you press fire)

Menace
Reset after loading and enter:
POKE 8980,234
POKE 8981,234 (infinite energy)
POKE 8228,0 (greater cannon power)
POKE 8243,0
POKE 8261,0 (infinite lasers)
SYS 2080

Skate or Die
I couldn't find our copy of the game, so just what this listing does is a mystery to me. Give it a try anyhow. Enter and run the listing before loading the game.

```
10 FOR B=1 TO 20:FOR C=1 TO 20:READ A:POKE 49152+C,B:NEXT C:NEXT B:END
20 DATA 169,147,32,210,255, 169, 0,141,17,208,141
30 DATA 32,208,141,33,205, 76,22, 64,96
```

Dragon Ninja
Enter the listing and load the game for infinite lives.

```
1 FOR X=400 TO 437:READ Y:C=C+Y:POKE X,Y:NEXT
2 IF C=4015 THEN POKE 157,128: SYS 400
3 PRINT "THAT IS WRONG"
4 DATA 32,86,245,169,32, 141,84, 3,169,166,141, 85,3
5 DATA 169,1,141,56,3,96, 72,77, 80,72,169,173, 141
6 DATA 122,128,169,0,141, 76,130, 194,173,32, 208,96
```

Turbo Boat Simulator
Reset and enter:
POKE 27937,69 (infinite lives)
POKE 29955,173 (infinite power)
SYS 27650

Pro Skateboard Simulator
Enter the following after a reset:
POKE 3701,69 (infinite time)
POKE 56567,103:SYS 28416

To Hell and Back
Reset and enter:
POKE 32483,173 (infinite energy)
SYS 30464

Peter Packrat
Reset and enter:
POKE 53214,173 (infinite lives)
POKE 48546,173 (infinite time)
SYS 32768

Magic Carpet
Reset and enter:
POKE 52957,234
POKE 52958,234
POKE 59259,234
SYS 11770

Boulderdash
This infinite lives listing comes from Andrew Thomas. Enter and run it before loading the game.

```
0 REM HACKED BY ANDREW THOMAS
3 FOR A=49152 TO 49152+39: READ B:POKE A,B:C=C+B:NEXT A
4 IF C<>5159 THEN PRINT "ERROR IN DATA"!:END
6 SYS 49152:LOAD " ",1,1
10 DATA 120,169,192,141,21, 3, 169,13,141,20,3,88
11 DATA 96,162,0,189,29,192, 157, 239,2,232,224,14,208
12 DATA 245,76,49,234,169, 234, 141,236,138,141,237
13 DATA 128,76,79,142
```

Blagger
Kal Stakir let me in on this cheat, which he tells me was discovered by a friend when Blagger was the most popular thing around. I didn't know it ever was, but there you go. Instead of starting the game with the usual press of the space bar, just give it a quick tap. The score resets and your lives clock up to five. Now you can start at any level by pressing the key with a corresponding ASCII code to the required level. For example:
RUN/STOP starts the game at level 3
RETURN starts at 13
INST DEL starts at 20
CRSR RIGHT starts at 29

Robocop
Another tip for Ocean's best seller: hold down **F, G, H** and **J** simultaneously and move the joystick in the direction you are facing. This puts you up to the top of the screen where you cannot get hit by any bullets.

Super Zaxxon
For the ability to fly through walls, aliens and bullets, type **RED** on the title screen. You may have to do it a few times, and type it quickly. Once the cheat mode is active, the message 'RED SUPER ZAXXON' appears.

I have had a few letters from competent pokers who need some guidance when it comes to finding a restart address. Drop me a line if you can help. As always, there are goody bags awaiting the best contributions, so get them to me at this address:

Uncle Horgan
Hearty Horgan's Hints
CCI
40 Bowling Green Lane
LONDON
EC1R ONE

Charts

Chart Chattering Events

Well, well. Richard (O.K. Mates!) Branson makes it to the top! No, it's not a balloon story (why no computer game of that or your ex-record Atlantic powerboat crossing, R.B.?) It's Silkworm serpentining its way right up to Number One. (We warned you, didn't we?) This hot shoot 'em up has taken two months to grab the Top Spot. So somebody (you?) out there has found the time to lock eyes with the monitor even during the heat waves. Last month's champ. Speedball, tumbles a place but there is a threatening new entry with U.S. Gold's Forgotten Worlds jumping straight in at Three. That could push up to One at its present speed ... Another new entry is Domark's Licence to Kill at Five. Another licence – not to kill but to print money – Firebird's Startrek boldly flies in at Nine but Imageworks Phobia seems to have run out of the fear factor and slips to Ten.

Amiga-wise, Forgotten Worlds hits the Top first try (Well, done Danielle!). Will it make the double with the 8 bit next month? E.A.'s fast lane Powerdrome hurtles in at Two and Silkworm (another possible double taker) enters at Four. Anco's great Kick Off keeps on scoring at Five.

On the Cheepie chart, The Hit Squad strikes again with a new Numero Uno, Yie ar Kung Fu. Though last month's Biggie, Rambo has been completely blown away (hooray!). Kixx – USG's budget label – zooms in with Pit Stop II and the Codies have a strong new entry with Pro Boat Simulator. (Simulator? Isn't that word past its sell-by date darling?)

Z.M.S

GAME TITLE	COMPANY	LAST MONTH	RATING	PRICE
1. Silkworm	Virgin	(2)	Mega	£9.95
2. Speedball	ImageWorks	(1)	Mega	£9.95
3. Forgotten Worlds	U.S. Gold	(–)	Mega	£9.95
4. Red Heat	Ocean	(4)	Crisp	£9.95
5. Licence to Kill	Domark	(–)	Crisp	£9.95
6. Robocop	Ocean	(3)	Mega	£9.95
7. Stormlord	Hewson	(7)	Crisp	£9.95
8. Real Ghostbusters	Crisp	(7)	Crisp	£9.99
9. Star Trek	Firebird	(–)	Crisp	£9.99
10. Phobia	Imageworks	(9)	Dodgy	£9.99
Amiga				
1. Forgotten Worlds	U.S. Gold	(–)	£19.99	
2. Powerdrome	Elect. Arts	(–)	£24.95	
3. Lords / Rising Sun	Cinemaware	(1)	£29.99	
4. Silkwor	Virgin	(–)	£24.95	
5. Kick Off	Anco	(2)	£19.99	
Budgets				
1. Yie Ar Kung Fu	The Hit Sqad	(–)		
2. Pit Stop II	Kixx	(–)		
3. Bombjack II	Encore	(3)		
4. Rally Cross	Codemasters	(4)		
5. Pro Power Boat Simulator	Codemasters	(–)		

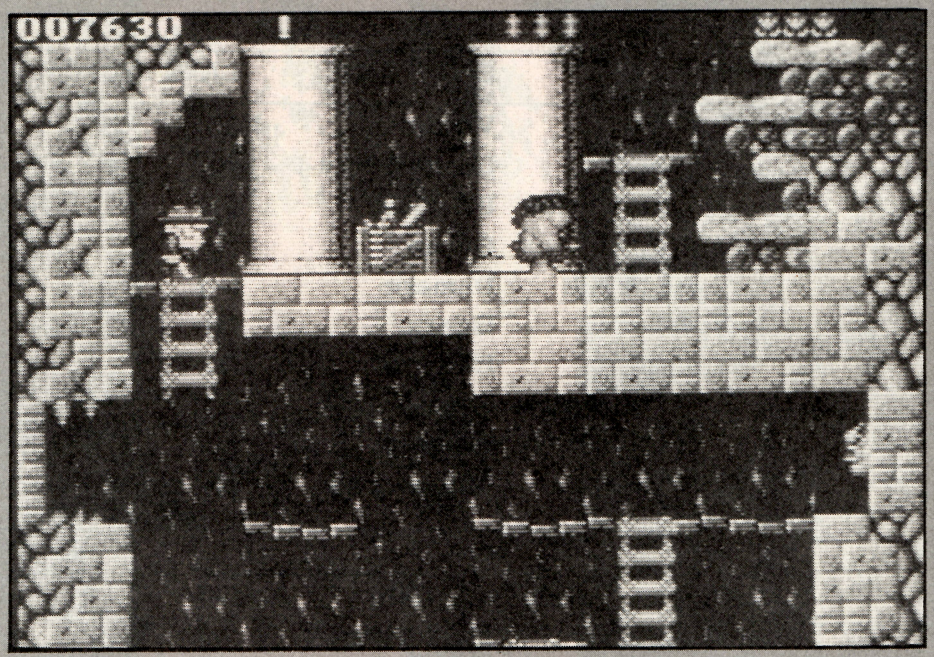
RICK DANG

Firebird

Richard Dangerous, Dicky Dangerous - call him what you will. MicroProse call him Rick D. He sure looks like Indiana Jones to me. What do you reckon Henry? Trust the Marketing men to squeeze publicity out of a fashionable concept which they haven't even payed a penny for. Anyway, Rick Dangerous is a new game from one of MicroProse's new aquisitions - Firebird. By the looks of it, Firebird have been given a neat shot in the arm because this old fashioned platforms and ladders, shoot'em, prod'em, blow'em-up is a little cracker.

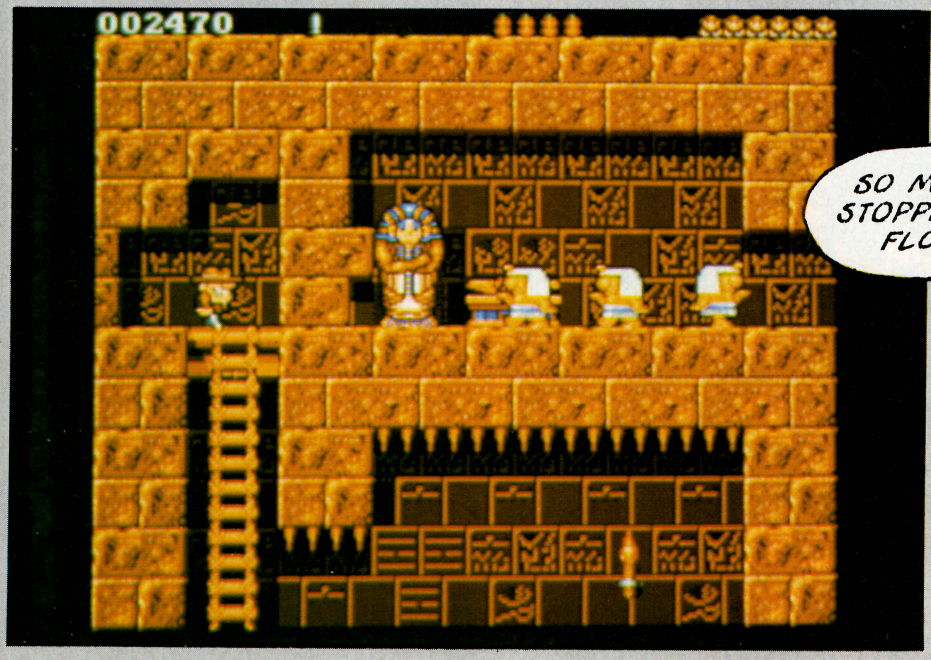
The game package arrives with one game disk, a fold out set of instructions with a small poster of the man himself on the other side and a nicely presented, eight-page comic which gives the background story to the story.

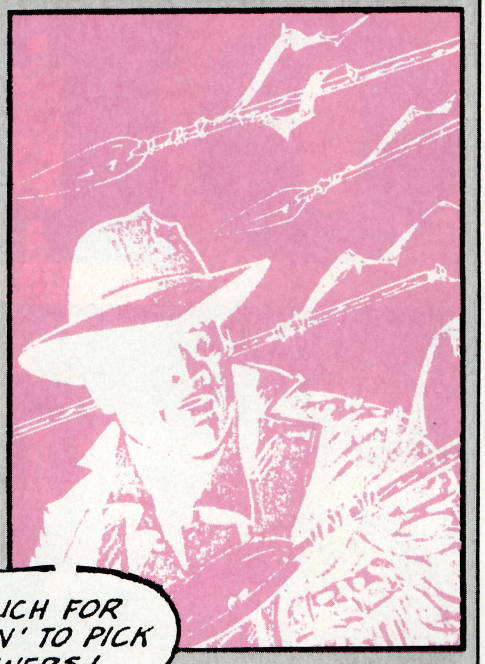
It appears that Rick is after the map which reveals the ancient Goolu temple. His chum, Jose, fails to deliver. Maybe being tied and gagged in his office had something to do with it. This is swiftly followed by several attempts on Rick's life. As he boards his aircraft to search for the temple a thump on the head indicates that he's not alone. He awakens to a portly gentleman, doing a Sidney Greenstreet impersonation, who wants to know what this jungle map business is all about (he smells a profit, you see). Both men launch into full scale fisticuffs, only to be interrupted by the pilot who casually explains that they've run out of fuel and isn't it a shame that there is only one parachute which happens to be on his back - exit one pilot. Rick is stunned. The Fat Man is too - chiefly due to a right hook from Rick. The fateful crash landing leads Rick to the lost Temple. However the Fat Man, in league with the tribesmen, is close on his heels. As Rick dives into the Temple entrance he sets





EROUS





off a trap which, like so many Chocolate Orange adverts, sets a rolling boulder carerring in his direction - enter your good self.

While running along corridors or crawling along small tunnels Rick may come into contact with one of the Tribsmen, hit a trap, spikes and so on. Upon which Rick looses one of his eight lives. Now having eight lives might sound alot but let me assure you that there are an awful lot of nasty, sneaky traps in there. You will need every one of those lives - and more! In his defence Rick has a pistol with six shots, some sticks of dynamite and a stick to do some prodding with. You will find that the bullets and dynamite will run out but never fear as there are extra supplies about. But beware! They are not plentiful and it is all too easy to blow them up with a stray bullet. The action is strictly traditional. Your little character runs, crawls and bounces along the platforms and ladders of the temple. Bonus points are present which can pump up your score somewhat.

If you and Rick manage to escape the Temple you enter a Pyramid where you must find the jewel of Ankhel. This stage comes complete with Egyptian nasties and suitable traps. After this area it is onto the Schwarzendumpf Castle to find intelligence information. Guards, traps and so on provide the enemy. Finally, you learn that London is to be the recipient of a missile attack so what can you do but save the day - guards, traps, etc, etc.

As I say, the idea is ancient yet I kept going back for more. Rick D's major asset is that it allows you to get into the game without presenting a barrage of unsurmountable barriers which may quickly lead to boredom. It is often the case that a game will never reveal its true qualities due to bad design. However, having emmersed myself in the gameplay of Rick D I felt confident that I could go just a little bit further. A big 'Well-done!' to Firebird for some sensible design implementation, therefore. In addition, the graphics are atmospheric and humorous. The sound is nothing special, but what there is of it adds to the fun. If you buy only one game of this genre - Rick Dangerous has to be your choice.

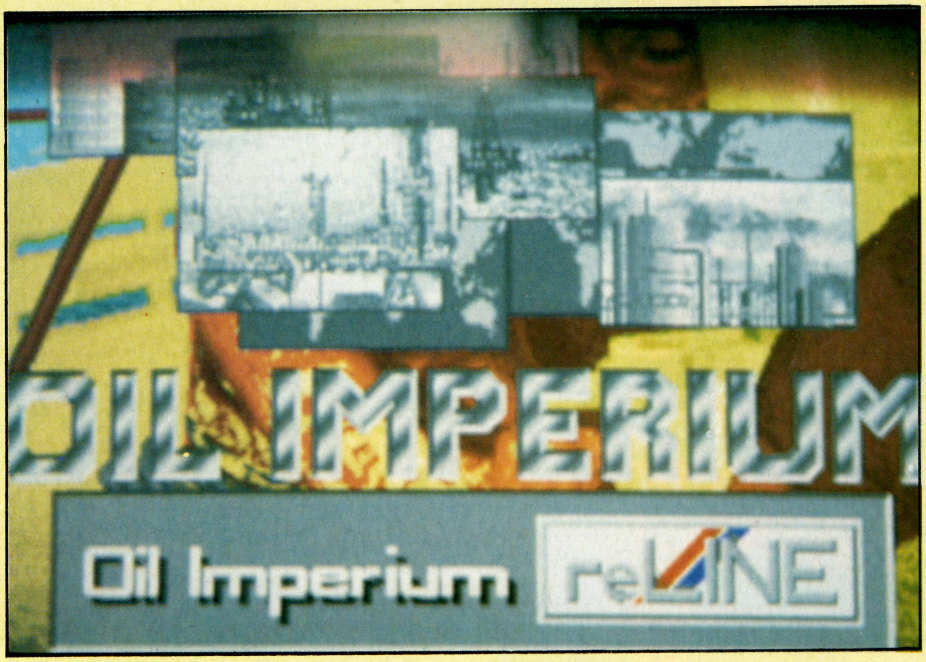
P.R.

Nice touches ...

The comic storyline is a splendid one, which conveys the fast moving action while giving the adventurous 'feel' to the game. The comic-story is snappy an humorous while the artwork is professionally drawn. In addition, the inclusion of the poster, drawn from the Rick artwork, is a thoughtful inclusion which results in some use being put to the instructions (which would be totally ignored after the first couple of plays anyway).

Graphics:	90%
Sound:	70%
Playability:	90%
Overall:	90%
Price:	£24.95

OIL IMI



reLINE

Good old J.R. Ewing, he's really got something to answer for! This game, although not based on the TV series "Dallas", has most of the dirty wheeling and dealing of that commodity called "liquid gold" that you see on TV.

You couldn't call this a simulation of the real oil business world, but as a game it is tremendous fun to play. The amounts of money that you will become accustomed

"This is a game of cut-throat commerce where real oil-hungry cut throats make fast mega-buck decisions."

to handling look like telephone numbers, in fact you can easily sell just one months production for over 20 million dollars and not turn a hair!

The program revolves around four players, either human or computer, these are the owners of four fictitious oil companies that control the entire oil production of the whole world. Your objective is to create your own empire capable of better production, bigger and better than your opponents, despite all the various setbacks.

This is a game of cut-throat commerce where real oil-hungry cut throats make fast mega-buck decisions. Starting off with a mere 5 million dollars, your company has the option of buying an operating licence, then an oil field, along with storage tanks ready to begin drilling. All of this is extremely expensive, but necessary to get yourself established.

"There are some quite beautiful graphics and musical ditties."

There are some quite beautiful graphics and musical ditties. The game has such an enormous amount of superb graphic images that two disks are needed to contain the required program information. After you have chosen your company's name then you have a choice of four different office layouts. Your office becomes the operating base where all major decisions are made.

The game is driven by moving a pointer around, suitably an oil



PERIUM

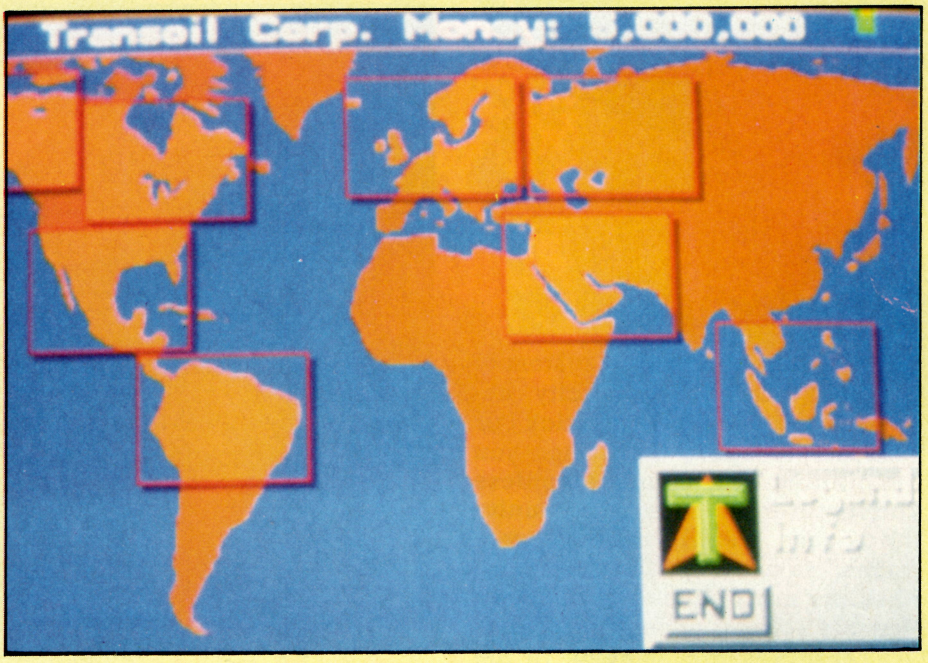
can, pointing at the many icons to choose your next move. Each player has a calendar in their office showing the current date, you are allowed a whole month to complete your turn. Each operation takes at least a day so you can get through a fair amount of trading during your turn.

Buying oilfields throughout any area in the world then deciding to drill yourself rather than contract a professional team leads to an arcade sequence. Here you must control the pressure and direction of the drill head as you watch a cross section of the rock strata and an overhead scanner view trying to keep the drill head in line. A sucessful drilling will bring your oil gushing to the top, and lovely lolly flooding your pockets.

The computer in your office is an Amiga of course! From the workbench screen you use your pointer just as with the real thing. Choices available from the computer are to buy and sell both oil wells and the oil produced. Drilling options and expert advise on the feasability of any oil field can be made here also. A statistical analysis of your operations, such as invested capital or ready cash is available. Graphic wallcharts show your current economic status and any current contracts.

Every now and then the phone rings in your office. The message is often bad news, usually such as oil platform on fire! There is another arcade sequence here as you can chose to fight the fire yourself instead of contracting the famous Ted Redhair. Fly to the destination and drop by parachute landing directly at the rig. Control the fireman by joystick, laying dynamite to blow out the flames, being careful not to use too much and make sure you get out before it blows!

There's one other arcade sequence I just hated, not because



of bad programming but because you have to plan and complete the laying of a pipeline before the computer completes his. The race is very frustrating as sometimes a

"Newspaper headlines keep you in touch with the latest worlds oil news, including the news about operations on the other side of the law!"

deal worth tens of millions hangs on your quick reflexes and mental agility. I hated this bit as it was so addictive, you could win or lose a contract by a split second!

Newspaper headlines keep you in touch with the latest worls oil news, including the news about operations on the other side of the law! Dirty dealing! You can hire the service of an undercover agent who can be used to create havoc with your opponent's businesses. Get a crook to blow up a pipeline or storage tanks even blackmail or set fire to an oilfield.

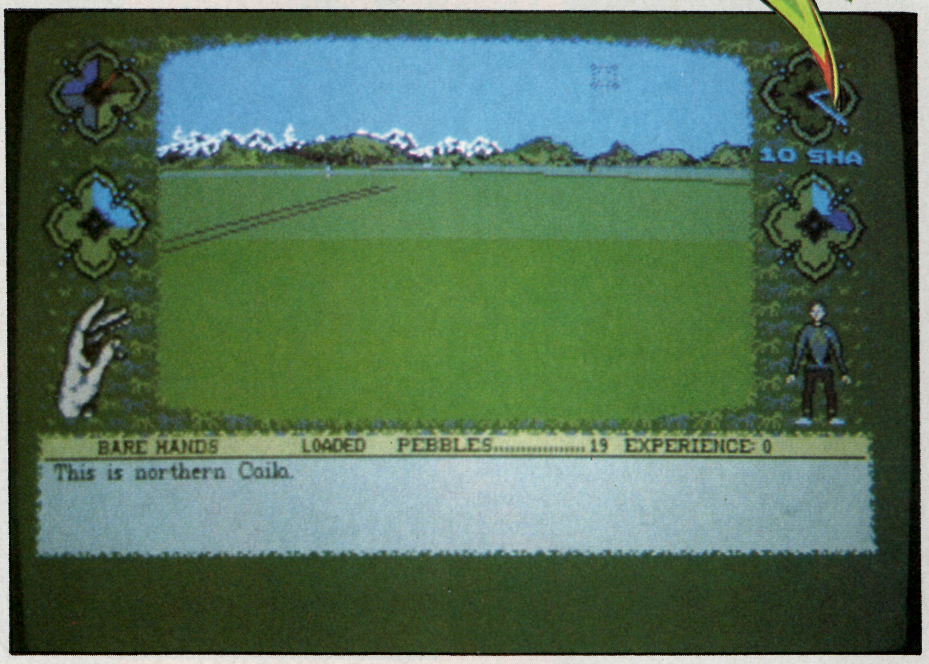
Criminal actions may be detected, and you can employ your own detectives to catch a shady dealer. Court proceedings will follow and the offender may be punished by losing a couple of oilfields.

You'll soon get the hang of trading. Handling huge sums of money becomes rather addictive. Accumulating huge sums of money is even more addictive! Overall this game has some brilliant graphics, the sound sequences are quite outstanding, and it is a real joy just to listen to the title screen music!

B.C.

Graphics:	90%
Sound:	80%
Playability:	80%
Overall:	85%
Price:	£24.99

SLEEPING GODS LIE



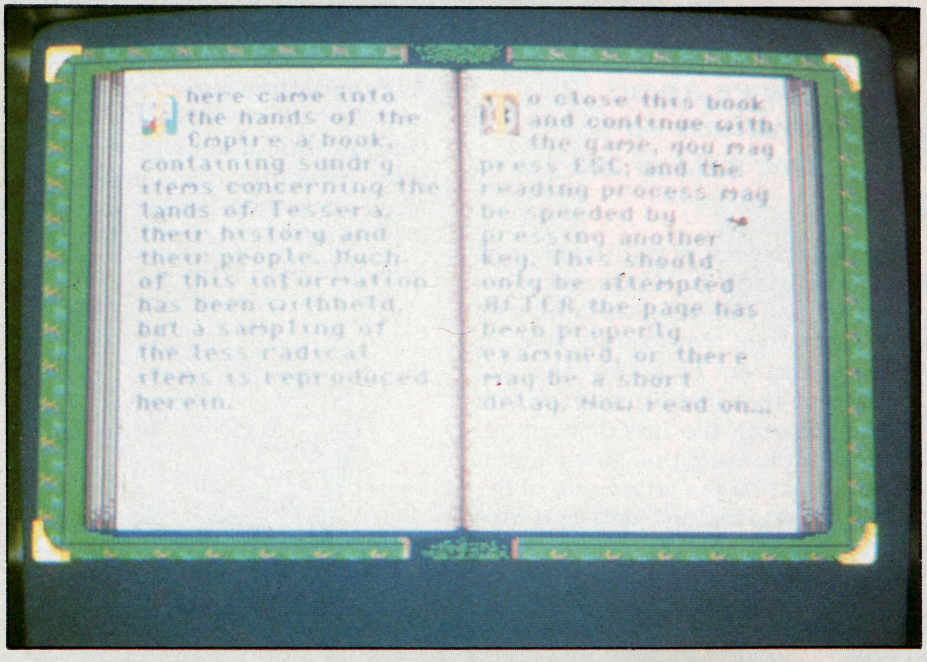
Empire

With a command system of absolute simplicity using either joystick or mouse, 'Sleeping Gods' has you beginning as a poor weaponless adventurer, given an opportunity to amass wealth, armour, weapons, fame and fortune in a healthy mix of hack and slay and puzzle solving adventuring.

There you are at home in the world of Tessera, when you are awakened by a dying Kobbold crashing through your front door. He begs you to find 'The 'leeper', an old God rumoured to be slumbering in one of the farthest flung of Tesseras eight kingdoms. Only He can save your homeland from the grip of the Archmage and his henchmen.

Not being one to dismiss the promise of adventure, you rise to the challenge and after picking up a few salutary items from your dwelling, open the front door and go about your quest, with 94 landscapes full of bandits, demons and monsters ahead of you.

The landscape is depicted using 3D modelling and solid bit mapped imaging, that does convey well a feeling of distance between you and say a far off objector gateway. Collecting ammo or anything for that matter is undertaken simply by moving over the object in question, to find it appearing in your inventory.



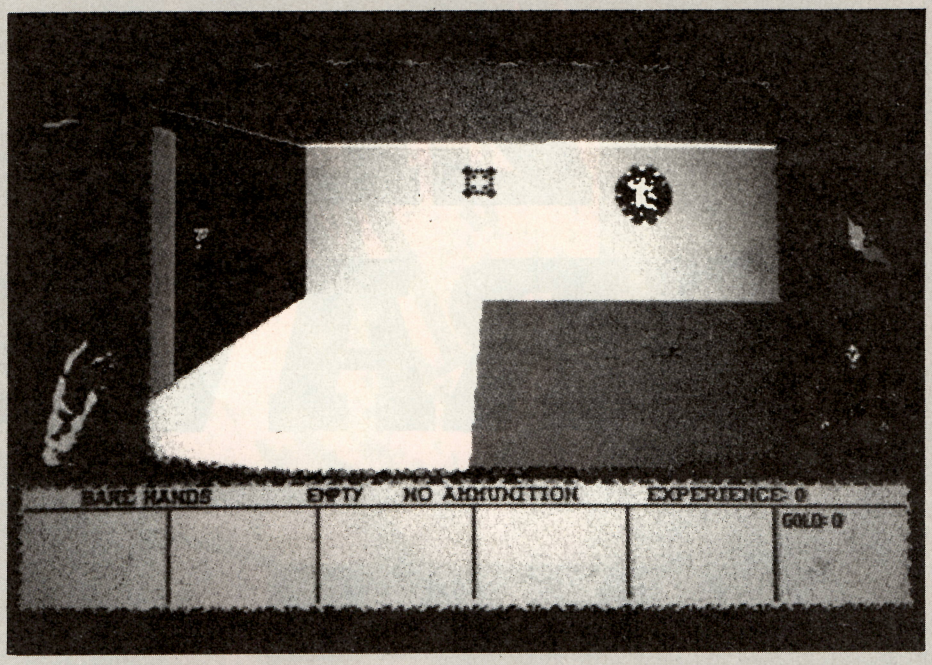
You will always have access to your current most powerful weapon in your possession,although you can change, and as you start with only your hands and some pebbles to throw, as they say in the song, the only way is up! Along the way you get to fight bandits and these guys carry all sorts of goodies, so killing them could get you maybe a sling, or a blowgun, crossbow etc.

The graphics are well drawn, although at times the action can slow somewhat when there is a lot on screen, but not enough to spoil your enjoyment. The sound however is disappointing, as apart from a pleasant opening sequence there is not a lot to shout about except a few explosions and bit and pieces. The text portion of the screen is a strip across the bottom which doubles as your info box, and to the sides

Thoughts from the adventure expert...

It never ceases to amaze me how much adventure games have evolved into so many different types. What was once a traditional text omly product, has now made way for text with portrait graphics, animated pictures with text, film-like graphical blockbusters with sound,-first person perspective with sound and text and Uncle Tom Cobbly. Huge multi sited multi hundred location epics that have stretched programming techniques to the limit.

In the seemingly endless quest for a 'new' style adventure, the current genre seems to be set in first person perspective using action interspersed with puzzle solving. This approach was used to great effect initially bty Incentive Software with their 3D Freescape system, and there is no doubt in my mind that this has been the role model behind Empires 'SLEEPING GODS'.



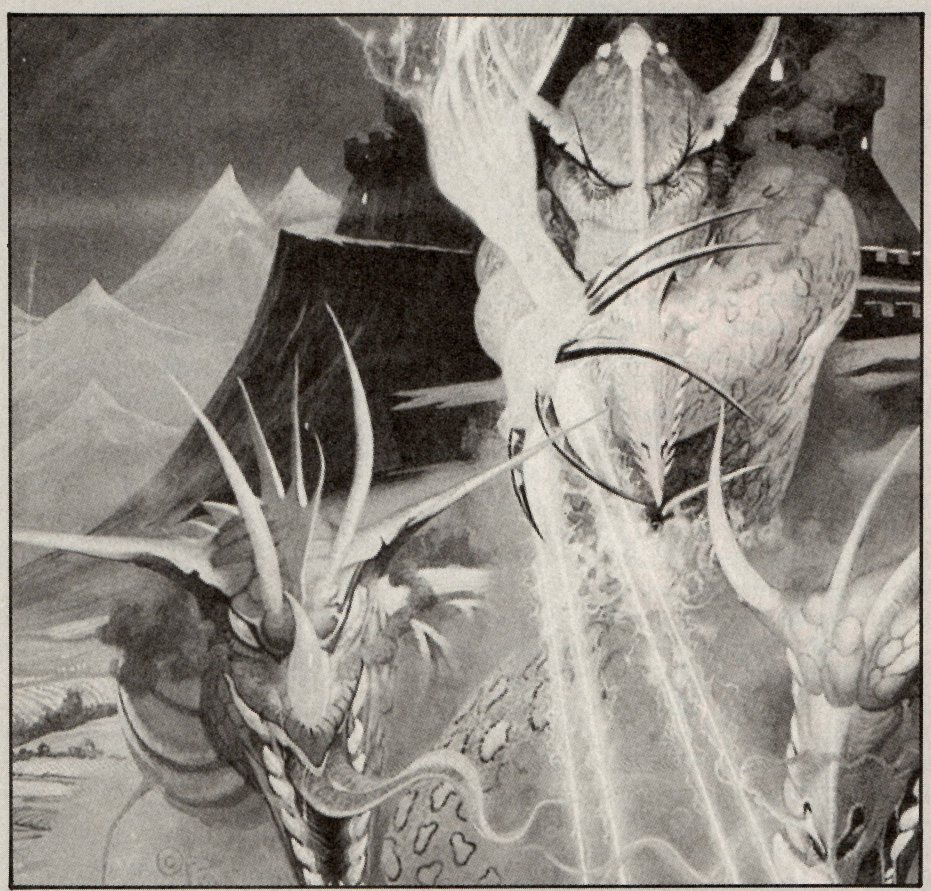
are various monitors, like a compass,health check (eating berries and veg, along with sleeping restores your stamina) clock, current weapon, all useful stuff and easy to keep an eye on. I must say that I found the combat system a little twitchy, maybe some collision calculations have got slightly arry but more than a few times I found myself throwing a last hope missile in the general direction of a fleeing bandit, seeing it miss by a few feet and then seeing said bandit explode into lots of little bits of bandido. And the same can be said for my own damage assessment! You have been warned.

The process of throughplay is fairly linear, in that you can only explore one kingdom at a time; all the puzzles for that kingdom are built in there somewhere, it's just a question of finding them. That done, you then obtain an object that enables you to be transported to the next kingdom, and so on.

There is a curious mapping technique you have to learn as Tesseras directions are not quite what you are used to. This is really confusing at first, but you get the hang of it after a while, along with the time, which seems to be one hour to five of our minutes. There is a nine hour day with a three hour night, and seventeen months of seventeen days in a year! Confused?

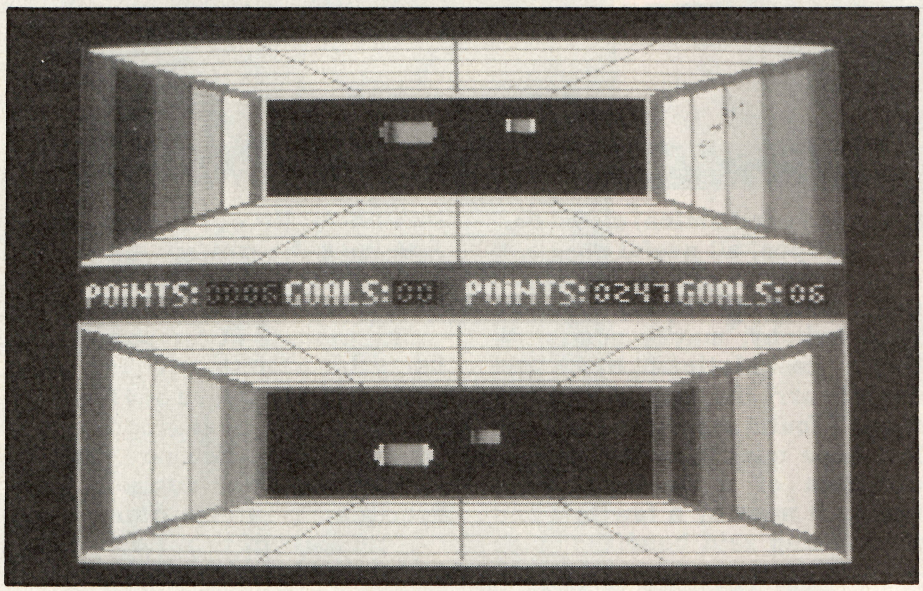
Don't worry because all of this is really irrevelant, just concentrate on killing baddies,solving the puzzles and saving a hell of a lot. A joyous romp guaranteed then, sit down with lots of coffee and be prepared to play the night away.

A.M.



Graphics: 90%
Sound: 65%
Playability: 95%
Overall: 83%
Price: £24.99

ZERO GRAVITY



EAS SOFTWARE

Zero Gravity is a boring bat and ball game. Still here? Haven't turned the page yet, huh? Okay you asked for it. The fair hands of Olaf Schneider produced Zero Gravity for the West German software company, EAS. Dirk Quabs (!) produced the C64 version. Judging by the credits, ol'Dirk required quite a bit of help from friend Olaf to complete the conversion. I expect Dirk became a quivering wreck as a result of his superhuman efforts to complete the conversion *and* maintain his sanity. But such is life.

Played from a ground level perspective, Ground Zero is a single or two-player bat and ball, tennis-type game. The screen presentation takes the form of a split-screen which shows you and your opponent's bats. Sitting between the split screen is a bar that shows how many goals and points accumalated. Normally, the first player to score ten goals is the winner, however, you could decide that the player with the most points wins the game. You could then try *not* to score goals in an effort to score more points.

The action takes place in an enclosed room which is surrounded by rectangular panels. While the panels on the floor and ceiling are redundant, the wall panels contribute to the game by triggering features. When the ball is hit by a player, and strikes a multi-coloured wall panel, it lights up adding a feature which may affect that player or the ball itself. Once the feature has been triggered by the panel, you are shown what the feature is as it appears behind the opponent's bat at the rear of their goal. The ball may speed up or slow down; in addition you may gain, or lose bonus points, with the two standard figures being plus or minus eight or 16 points. Another feature is the panel which will increase or decrease the amount of goals.

Other than the limited extras, there is nothing to set Zero Gravity apart from a simple, and totally boring, bat and ball game. I have played many games of Zero Gravity and I have spent most of the game not quite knowing where the ball is going or where the bat should go. I may as well have shut my eyes and whistled Dixie. It is also difficult to know exactly when the ball has arrived. Sometimes the ball appeared to have reached my side of the room so I "hit" it back and began to move off to another position of the screen, ready for the next return. Only to find that no, the ball was still on the way. So I watched it deflect off the ceiling into the goal with silent resignation. Sorry Olaf, not my cup of Schnapps.

P.R.

What exactly is gravity? ...

The Oxford English Dictionary defines gravity as the 'Attractive force by which bodies tend to centre of earth, etc; degree of intensity of this measured by acceleration; gravitational force.' Zero gravity is the term used to describe the lack of this phenomenon and the condition in which weightlessness in space occurs.

Graphics:	19 %
Sound:	21%
Playability:	18%
Overall:	19%
Price:	£14.99

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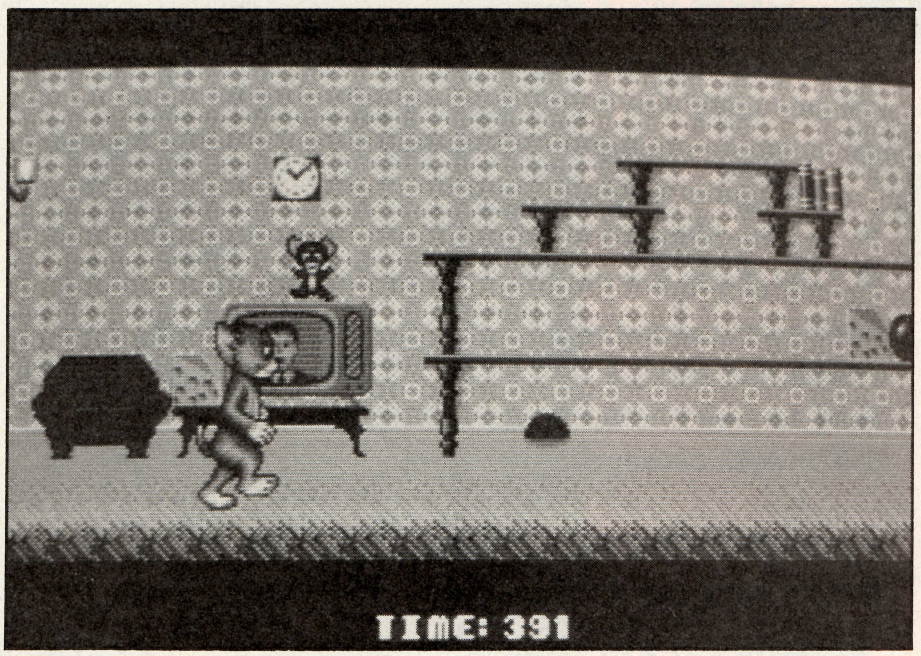
LOG ACC O.K.

Tom and Jerry

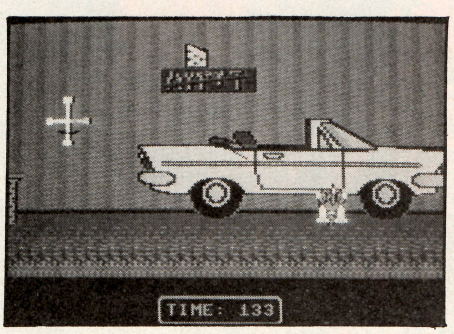
Magic Bytes

In my book, Fred Quimby's old Tom and Jerry cartoons knock the spots off the competition, including anything that Disney has to offer. Whether that is a good enough reason to attempt a computer game based on those old classics is another matter, especially in view of Magic Bytes' previous cartoon cock-up. They had a go at a Pink Panther game some time ago, but that turned out to be even more irritating than the cartoon itself!



Along similar lines to that turkey, Tom and Jerry takes the form of a collect 'em up platform game. You are cast as Jerry, who's job it is to sniff out and eat every piece of cheese in the house. These cheesy morsels have been put in the most awkward nooks and crannies, of which there are many in the plush furnishings. Most are found on top of the bookshelves, armchairs, lamps and coffee tables. To get at the higher cheeses, a hop across from a shelf is often not enough. Armchairs, lamps, tyres and a few other objects have a trampoline effect. Tom is constantly on your tail, pouncing as you fail to make it across a gap, but he can be held at bay by dropping a hammer or bowling ball on his head. Another method is to leave a banana skin on the floor to send him skidding off the screen.

Mouseholes in the skirting board lead from one level to the next, bringing into play a simple sub-game. As Jerry runs along the passage, Tom rolls obstacles to be dodged while you pick up more cheese.



In general the graphics are not bad, but only show a cartoon influence in the peripheral screens and Tom's smoothly animated sprite. The sound effects on the other hand, are weak at their best. Straight platform games are old hat, but can be great fun all the same. The feel has to be right, a large part of which is down to responsive controls.

Jerry does not so much jump around the screen, as float. You can control him in mid-air, but only, it seems, when the computer feels like letting you. As a result you never get a sense of being in total control. The confusing collision detection makes matters worse, as you often do not know whether an object is impassable or not until you run into a dead end, usually to be hunted down by Tom. Above all, a Tom and Jerry game should be fun, if not funny. This tedious game is far from either.

T.H.

Graphics:	64%
Sound:	20%
Playability:	31%
Overall:	40%
Price:	£9.95 (cass)

Amiga

Only minor improvements in the graphics mean the Amiga game is not much to look at. The one area it does beat the 64 version, as it should, is the sound. Thanks to some sampled effects, a hint of humour shines through. Unfortunately, the gameplay is no better.

Graphics:	61%
Sound:	72%
Playability:	31%
Overall:	28%
Price:	£19.95

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RAINBOW WARRIORS

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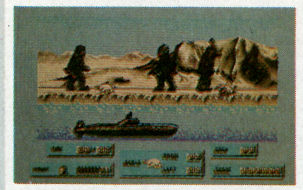
RAINBOW WARRIORS

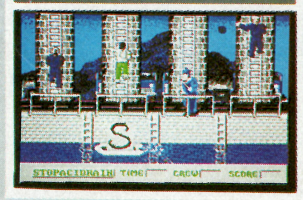
GREENPEACE





Micro Style





GAMES FOR ADULTS

UNIT 1, HAMPTON ROAD INDUSTRIAL ESTATE, TETBURY, GLOS. TEL: 0666 504326/504412.

It was not long before Christmas '87 that Chris and Jon of Sensible Software unveiled their innovative Shoot 'em up Construction Kit. A few had previously made attempts at game creators for the non-programmer, but none had come anywhere near the scope of SEUCK. Sensisoft are remaining faithful to the 64, so Richard Linefelner was called in for the programming of the Amiga version.

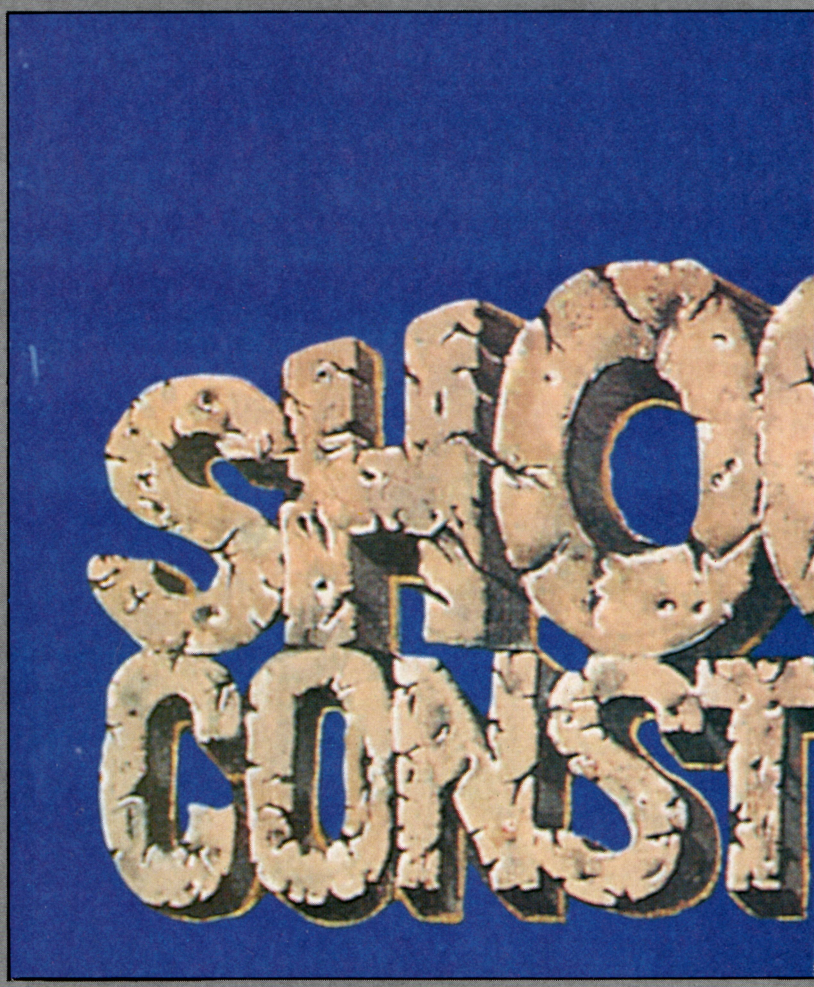
SEUCK is a menu-driven utility, which bridges the gap between the average gamer and the Amiga's workings. You draw the graphics, select the sounds and construct the levels, and SEUCK turns all that into assembler. The result is a game which can be saved out to disk and rebooted without any intervention from the creation program. Rather than starting a game from scratch, beginners are best off tinkering around with one of the three games included on the disks. Slap 'n' Tickle (a Slap Fight clone) is a traditional spacey zapper, Blood 'n' Bullets owes a lot to Commando, and Psychoblast demonstrates the static screen potential.



The most immediate alteration you can make is to the players' sprites. Selecting Edit Sprite from the main menu takes you on your way to the sprite design control panel. From here you can cycle through every sprite in memory to find the one you want. An expanded view of the sprite appears in a grid, used for re-drawing. Each sprite can have a number of animation frames, either linked to the direction in which it travels, or constantly flipping through a sequence. Using the copy feature, you can duplicate a frame and make fine alterations, and corrections and variations can be achieved by mirroring or sliding the image.

Setting up of the background follows a similar procedure. Both scrolling and static backgrounds are made up from a bank of blocks. These are drawn just like the sprites, then put on the background as if

A Note From Tony:
Pre-production copies of SEUCK have been around for a good few months now, and some very early versions have actually been reviewed elsewhere. Glossing over a product's low points is easily done in return for an early review (perhaps subconciously), but if you want an unbiased opinion, you can count on AUI.



Outlaw

you were tiling a wall. Careful use of the blocks avoids a patchwork effect, whilst providing a far quicker and more memory efficient method of drawing long scrolling backgrounds. The backgrounds themselves cannot be animated, but you can get round this by placing an animated sprite over the appropriate piece of scenery. You could even take this idea one step further, by drawing the block beneath the sprite as the sprite's wreckage, which appears in its place once it has been zapped.

With your sprites and backgrounds drawn, the next step is to put the two together. Each enemy needs a start point and a path to follow. With Edit Attack Waves, you can scroll through the map to find the enemy's entry point. Laying its path is just a matter of guiding it with the joystick. A few clicks



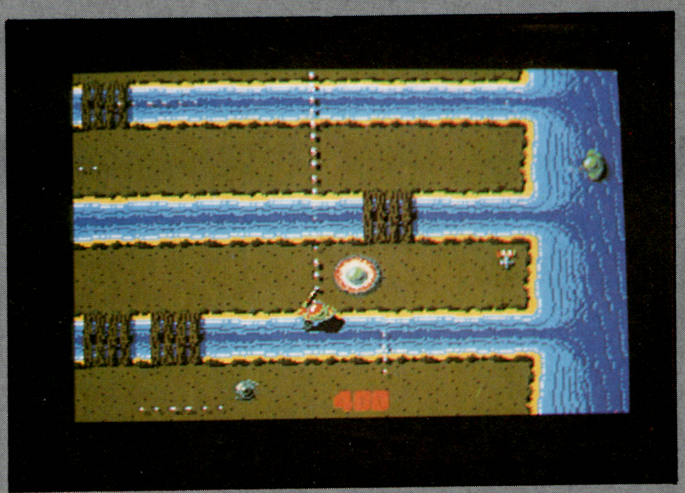


later, the enemy is ready and waiting to be blasted.

Attack waves are not the only variables concerning the enemies. Each enemy can have differing fire rates, firing directions, speed, strengths, sound effects and explosions. They can also be designated "collectable", and so turned from enemies into bonus icons. For a real arcade finish, the explosion can be drawn as a flashing "200" or whatever, corresponding to the bonus awarded. Likewise, instead of the usual explosion, a fanfare or jingle can be assigned as its explosion sound effect.

The sound effects feature is one of the most interesting parts of the program. Three directories of IFF samples are included on the disks. Any of these can be loaded and played back during the game at various sample rates (though not backwards). Among the more usual laser effects are some excellent sounds, such as breaking glass, cries of pain, a klaxon and a dalek. You can also use any sounds you may have yourself, though the stubborn disk interface could have been improved.

SEUCK's design is excellent. The only area that disappoints is the graphics. Although there are no significant restraints on the number of sprites, the scrolling and sprites are often jerky. The players' ships move in uncomfortably large steps (unless you give them very low speeds) and the sprites follow suit. The scrolling window is reduced in width, and is not smooth even then. To be fair, there are often a lot of objects on the screen at one time, but if I didn't know better, I would think it is an ST port.



The creation of a game is a very long process. Just drawing the graphics can take ages, more so than with the 64 version, due to the big increase in resolution. Unless you just intend messing around with the demo games, a lot of time and commitment will be needed for satisfactory results. An extra weapon facility, and possibly an optional horizontal scroll would have further improved the program, but even so, SEUCK is a very clever bit of software. Even if you don't end up with a number one hit on your hands, you'll at least have had an insight into the life of a game programmer and designer. Put a lot into SEUCK, and you'll get a lot out of it.

Price: £29.99

T.H.

688 ATTACK SUB

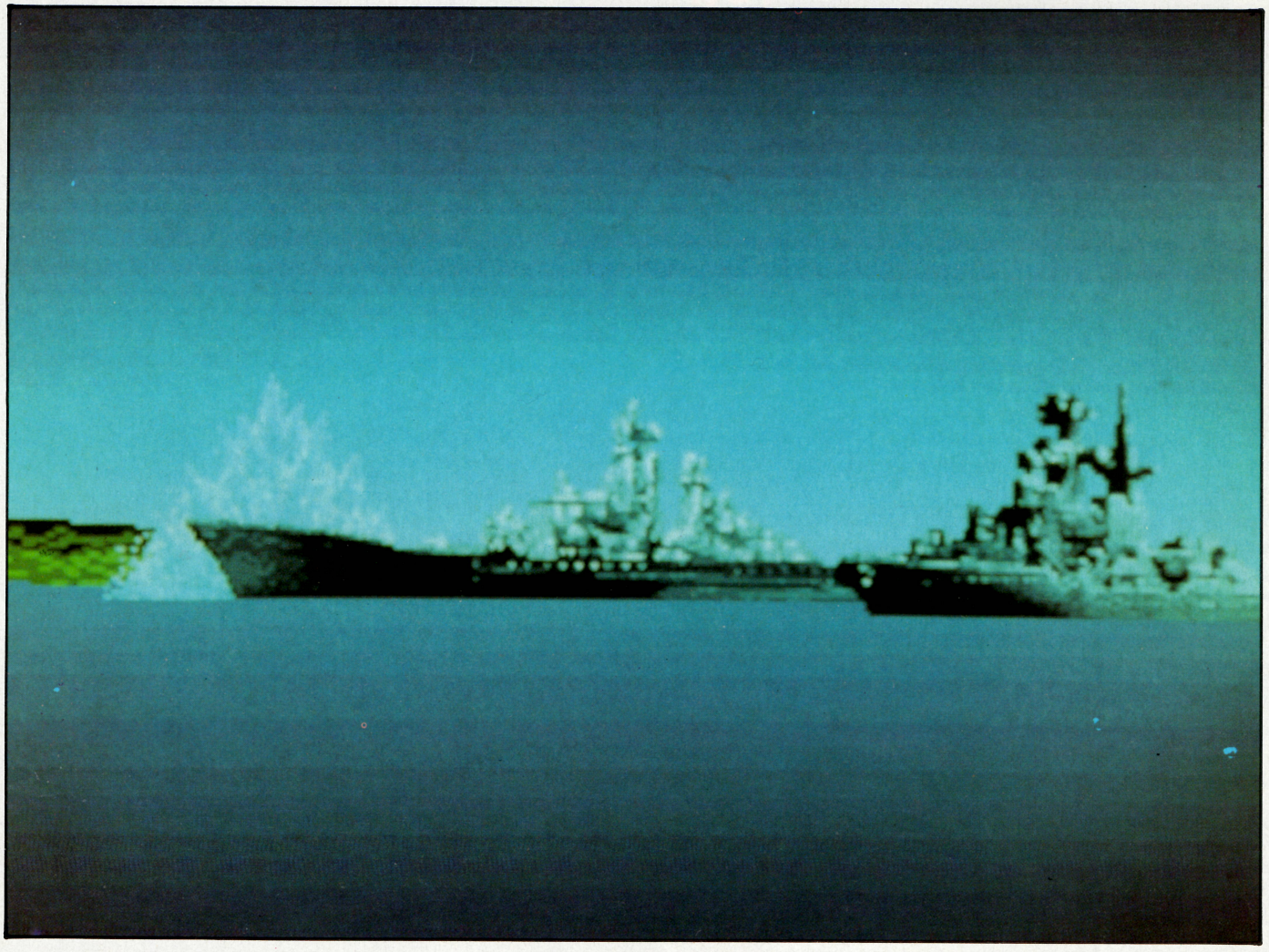
Electronic Arts

688 Attack Sub, Electronic Arts' new submarine simulator, will have you smiling even before you open the box because, trapped inside the shrink wrapping, is an authentic cloth patch of the SSN 688. With the words "Hunter Killer" emblazoned down each side. This patch is a beautiful piece of work which, I am sure, would normally cost you four or five pounds to buy.

On opening the box you will find two 5¼ inch floppy disks and one 3½ inch disk for those with suitable drives, a 77-page manual completes the package, 688 Attack Sub (hereafter called, simply, 688) presents you with the command of either an American Los Angeles class or, uniquely, a Soviet Alfa class submarine, with a variety of missions to complete.

Personally, I prefer this system of missions rather than the Silent Service method of "well there's the Ocean — go get 'em!" sort of attitude. It provides the game with a degree of punch and a definate aim.

The most important area of the game is the Conning Tower, which provides the basis for the main menu. From the Conn you can access any of the subs stations. To enter the Weapon Control Panel, for example, you move the cursor to the specified area of the screen and the cursor changes its shape to a torpedo to acknowledge the selection. However, before you do anything you have to get your mission orders. Electronic Arts have sidestepped the anti-piracy device



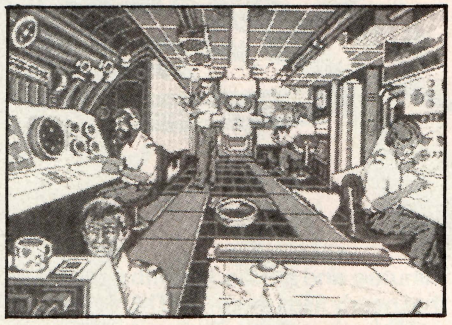
Sub simulation challenges ...
The problems of making a submarine simulator exciting troubled the game's three designers, John W. Ratcliff, Paul Grace and Randall Breen. In the end it was decided that realism could not be followed totally otherwise boredom may set in. After all, a real life mission would include long periods where absolutely nothing would happen. Changes had to be made, therefore. Initially, the designers were going to rely on a compressed time-rate, as seen in Silent Service. However, with the introduction of modern vessels and aircraft it was felt that while the speed of the torpedo could be increased with no touble, a helicopter, for example, would wizz across the screen at a rate of knots too fast to be acceptable. The decision was made, therefore, to alter the scales of some of the variables, such as reducing torpedo ranges. As Paul Grace commented.

"The game scale is such that ships move at a reasonable rate, torpedo run times are short enough to provide a fast feedback loop without the need for too much time compression."

very nicely here by integrating it into the game. On entering the Radio Room, from the Conn, you must raise the Antenna and transmit a codeword, which originates from the manual.

After the correct codeword is received the mission orders are given to you. Then it is back to the Conn. An interesting game feature is the on-line help. Simply press F1, with the cursor on the desired feature, and a help screen will appear. This is an excellent idea that has been sensibly ported over from the more serious business software, no-doubt. From the Conn you can select the Sonar Room, the Navigation Board, Weapon Control Panel, Ship's control Panel, Radio Room, Status panel and the Periscope.

The Sonar Room is used to identify the distinctive sound signature of a surface vessel using the Sonar Analyser and other controls. The Navigation Board is used to plot your sub's waypoint, or destination, and any tracks of targets you have identified. The Weapon Control Room directs loading, arming and firing of torpedos and missles. The Ship's Control Panel controls the Cavitation Level (that fine line between selecting the optimum depth and speed of your sub and the lowest noise level), the Dive Plane Control (the rate that the sub dives or surfaces) and various automatic functions. Engine controls and the rudder are also found here.



In the Radio Room, the Status Panel displays a side view of your craft enabling you to identify any damage you may have taken. The Periscope displays the world above along with a useful amount of additional information such as the enemy's level of Electronic Sensing Measures, which tells you how quickly you can expect to be detected.

The mission scenarios are varied and imaginative. Mission briefings are suitably lengthy providing welcome atmosphere for the task ahead. Examples of missions include: an inland strike, with Tomahawk missles, onto a Soviet nuclear weapon establishment; a revenge attack on a group of Libyan tankers for recent acts of terrorism; and a training exercise to sink decommissioned vessels. When commanding the Soviet sub missions include peacetime missions such as passively scaring American submarines away from your base area by identifying them via sonar or wartime missions such as ambushing American submarines in a Hunter-Killer mode.

Graphics in 688 are excellent. Both EGA and VGA are supported as well as the lower resolutions. EGA screens have been well executed, to an extent that they stand up very well to the VGA version. VGA is a definate improvement, however, giving a smoother look to the graphics as a result of the increase in resolution and the greater use of the available shades. Some of the VGA screens are of, almost, photographic quality and they certainly give the Amiga graphics a run for their money (at a much greater cost though).

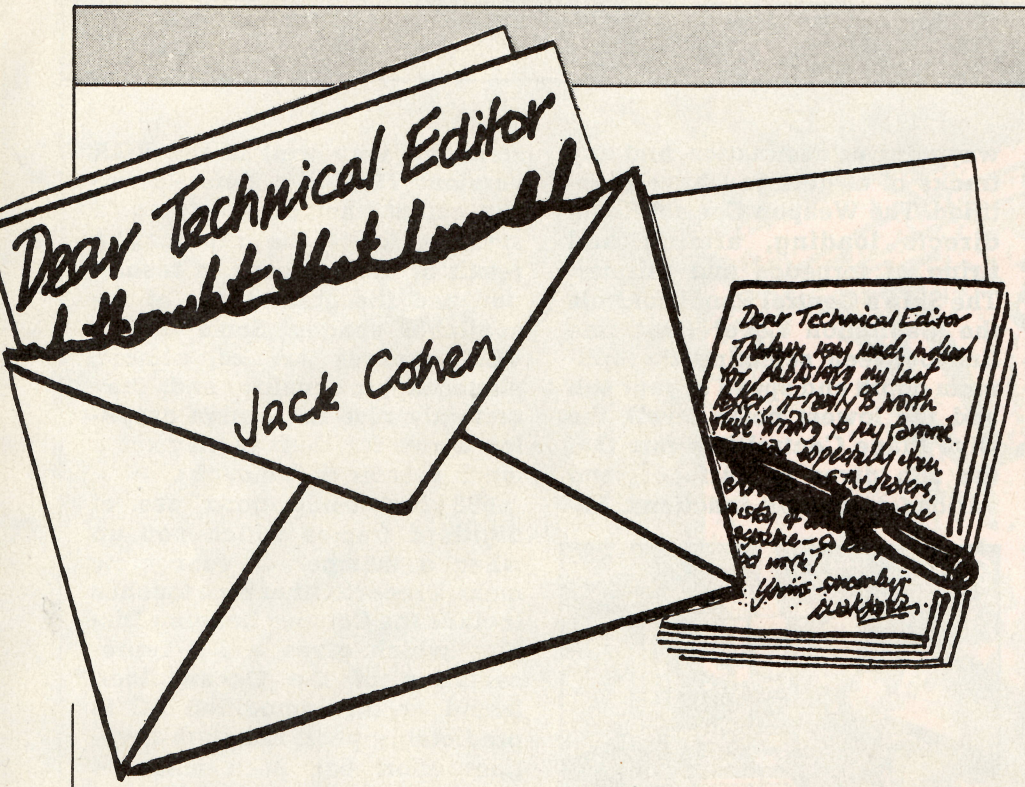
688 has made good use of digitised frames which pop up when a member of your crew make a report. Other nice touches include the Contour Imaging Display which gives a 3-D representation of the Ocean floor. Sound on an unmodified PC is predictably poor, although a valiant effort has been made to convey the submarine's many noises.

Support is given to sound boards they are, largely, items to be found in the States which is frustrating because other companies such as Microprose and Sierra are also supporting various soundboards. If they are available in this country then no-one is shouting very loudly about them. In addition to the single player mode you can face an opponent via a modem over the telephone line or in the same location using a null modem.

688 is certainly the best submarine simulation on 16-bit machines at the moment. The graphics are excellent, the missions are dramatic and exciting while the designers have made good use of the modern submarine systems integrating them into the game with good effect. I just hope that Electronic Arts see fit to write an Amiga version, because the Amiga was made for 688. Until then, PC owners will have this game all to themselves — lucky old PC owners.

P.R.

Graphics:	93%
Sound:	30%
Playability:	90%
Overall:	94%
Price:	£24.99



Dear Technical Editor,

Concerning a question by a reader wanting a means by which he could have a custom self-running ROM program to set-up his machine... I've these suggestions:

ONE: If there was need for only one or a few such self-running cartridges; the result could be had with a BATTERY BACKED - RAM - CARTRIDGE. The U.S.A. branch of DATEL (one of your advertisers) offers such a product; so also should your domestic branch. In the U.S.A. there is also a similar product called a "BROWN BOX" from: BROWN BOXES INC., 26 Concord Road, Bedford, MASS. 01730, USA. Their carts come in BATTERY-RAM sizes from 8K up to a 64K size that shadows and stores in frozen form the entire RAM of a C-64. (In use either cart. is loaded with a desired program and an auto-boot start routine, to be used as a ROM cart would be. As I recall at least one of these firms (likely both!) offer an auto-start utility, among those they include with the ram/cart.)

TWO: If a person is largely using DISK, but has a TAPE DRIVE it would be possible to have a set-up program on tape, that would be auto-run with the SHIFTED RUN/STOP ROUTINE like a game.

This is what I've done along these lines; I've a little DOS-WEDGE type program that among other things renumbers my second drive and changes screen colors, that I alost always use thusly when switching on. For convenience I HAVE THIS ON AN ENDLESS-LOOP ANSWERING MACHINE TAPE I leave in the tape drive almost all the time.

These tapes normally used in telephone answering machines have run times from 10 seconds to upwards of 4 minutes, and are loaded with a program that nearly filles them. (RADIO SHACK is a dealer in same.) Their advantage is they are always ready to re-run without re-winding.

As I've 3 disk drives, I seldom otherwise use tape now; thus leaving tape drive free for this endless loop- start-up use.

These tapes are expensive for common use; but they are handy for anything that constantly needs to be loaded and reloaded, such as a debugging aid or as in y case to load in a DOS-WEDGE. But another use is given in the next paragraph.

For instance I'm using the ROM-BASED "SKI WRITER 2" word processing program to write this letter. So I use a different endless loop-tape to re-load the LETTER-HEAD and PRINTER SET-UP CODES that the ROM can't stores. (Otherwise I'd have to re-key same, or shuffle set-up disks; as this program allows a storage set up consisting ONCE DRIVE EACH of TAPE (#1) and DISK (#8). (Files can be transfered from one to the other however, so I'll also mail a taped letter to other Ski-Writer users, as I've found tapes go through the post better than disks.)

Even if a person is a tape only user, if they've 2 drives and a TAPE DRIVE DOUBLER of the sort made for tape to tape copying that allow either tape to LOAD (or BOTH to SAVE at the sane time), they can use this method. When they aren't doing copying they could leave a start-up tape or often used program in one drive, and load and run if with the SHIFTED RUN/STOP method, then proceed to the other tape drive for normal work. (Note however that DATEL'S can't be used in this way as it has circuitry that allows one tape ONLY to play, while the other can ONLY record. The ones that can be so used are the "plain" ones that only double, with NO CIRCUITRY or LED's!)

As nearly all DISK users still own tape units, they can use them for certain other DISK DRIVE UTILITIES THAT CAN ONLY BE LOADED IN BY TAPE!!!

DISK DRIVE DIAGNOSTIC programs are one type as are the other 2 programs I give you here: #1 for RE-POSITIONING A DRIVE HEAD, say after an oiling or a hang-up. #2 is a DRIVE CLEANING AID that works by making the drive run for 20 seconds each time its run.

I trust that this information will be helpful to you in giving advice.

Yours truly,
Albert Benajam, USA

Here are 2 disk-drive related programs of the sort that can be loaded in from tape when needed. THIS FIRST ONE runs the head from tracks #'s 1,18,35. This is helpful to both check the drive's condition, and to re-set it when, especially after dis-assembly the head has to be re-positioned. NOTE: A correctly formatted disk, must be in drive when this is run.

```
listing
10 t=1:goto 50
20 if t=18 then end
30 if t=1 then t=35:goto 50
40 if t=35 then t=18
50 open 15,8,15
50 open 2,8,2,"#"
70 print #15, "u1,2"o;t,1
80 print "track"t
90 close 2:close 15
100 goto 20
```

SECONDLY; here's a program that will be of help when a "cleaning-disk" is being used. What it does is run the drive for about 20 seconds. Full on-screen information and instructions are given then user; and at the end, the options of re-running or terminating the program is given.

```
listing #2
1 rem *** title 'help clean drive' ***
2 print "S"
10 print "qq]]]r›program to help cean driver"
20 print "q]]]]]]mod. from p.41 of 1541 inst. book"
30 print"q]]]]]]][runs drive 20 seconds to help"
40 print "]]]]]]help cleaner-disk work.]"
45 print "]]r› insert cleaner disk now›R"
50 for n=1 to 3777:next n
70 print "qqqqqqccccccccc »»»»» drive running now! «««««"
80 open 15,8,15
90 for i=1 to 99
100 :print#15,"iO"
110 next i
120 close 15
130 print "qqqqqqqqqqqqq]]]]]]]run
```

over!!"
140 print "qqqrto repeatR› type 'run' & ‹CR›"
150 print "qqqrto endR› type 'sys 64738 & ‹CR›"
ready.

Albert offers useful info to other readers requiring autobooting programs.

Dear Technical Editor,
In response to the letter from Dr Wright in last month's (September) issue of ***CCI*** I would like to say that I too have the same set up as he has, I resently bought an Oceanic disk drive and the Action Replay IV (warp 25 cartridge) which I presume he means.

The difference however ends there as I have had no difficulty at all with compatibility, once saved all programs (saved from tape to disk, disk back ups or programs I have written my self and saved) all load and run with out any trouble at all. If Dr Wright is loading saved programs as follows, from start up, go into fastload (F7), load directory (F3) then move the cursor onto the title he would like to load and press F1, the program should then load and run automatically, if this does not work then I would say that there is a fault with either the drive or the cartridge.

Hope this will help out.

Yours Faithfully,
P. Quanbrough, Sheffield

Dear Technical Editor,
We have got a Commodore 64 computer which has stopped working, I have tried my friend's power pack and my machine works, so obviously my power pack needs replacing. I had an old brochure of yours and I noticed you were advertising a 64 power supply to be used if the power pack had blown. Please could you send me details of this as the brochure I was reading was 1986/87 and if this would be what I need and I haven't received any advise from the local stockists of Commodore.

Yours faithfully,
Mrs R.A. Wheeler, Surrey

Dear Mrs R. A. Wheeler,
In our Magenta pages you will find Power supply units for the C64 available at £19.95

Dear Technical Editor,
I have been looking for a good copying machine at around £10. I recently had a good working copying cartridge wich now is not working I want a disc copying machine. I also had a disc disector V3.0 I wonder what's better at copying a disc disector V3.0 the fast back 'em disc or the toolkit iv I want them to cost around £10 to £12. If you can suggest any better ones tell me will these copy all multiloads and heavily protected dics. I have written to you lots of times but none have been published, thanks for a great magazine.

From
Sam Tsiaplias, Australia

Dear Sam Tsiaplias,
Toolkit IV seems to have more features for under £10 and it may well be best for you. It may now be difficult to buy from the UK (because of a new law prohibiting the sale of copiers/ backup in the UK).

Dear Technical Editor,
I have a C64 & 1541 disk drive and have recently been offered a Commodore 3040 dual disk drive. However I cannot find a suitable IEEE 488 interface to connect the disk drive to the C64. I would be very grateful if you could give any information to assist me.

Yours Faithfully,
M. Teare, Isle of Man

Dear M. Teare,
A suitable interface is available from Meadmore Distributors of Liverpool. Tel: (051) 521 2202. Also you can try Supersoft of Harrow in Middlesex. Tel: (01) 861 1166

Dear Technical Editor,
I am a regular reader of Commodore Computer International, and I find that most readers do not have serious letters. This letter is mainly about software on the Commodore 128D with a printer. There are few questions which I would like to have the answers to:
1. Why is there so little software on my computer?
2. Why is the software expensive?
3. Why is the software which is available to do with business mainly?
4. What aren't there any graphics GAMES which use joystock control?
5. Why can't you print 128 games programs at the back like you did with the Hockey game for the +4.

Please could you answer the above questions. I write this letter on behalf of many of my friends with C128D's and myself, hoping that some hints and answers to the questions could relieve us of our anxiety.

Yours Faithfully,
Giri Mattaven, Kent

Dear Giri Mattaven
1. Making full use of the 128 operating system requires more work than for the C64. Software houses would not invest in 128 specific programs without some assurance of continuity of supply (production). A good supply of Public Domain Programs are available free to members of ICPUG. Amongst their many libraries are those for the 128, both native and CP/M modes. (see advert elsewhere in this issue).

2. This is because of the relatively small size of the market for the 128 as compared to the C64. The normal rule is that, the smaller the expected sales then the higher the cost.

3. Business's are expected to pay a higher price than individuals for software

4. Probably because it's all happened on the C64, and the 128 is both machines.

5. Reader's programs are always welcome, providing we think other readers will be interested in such programs. Any for the 128 submitted in accordance with the PROGRAM SUBMISSION PROCEDURE, (see our program section) will be considered. If we don't get 128 programs from readers then we cannot print them!

Dear Technical Editor,
Regarding M. Lambourne's letter in August '89 concerning a tape based PASCAL compiler for the C-64, there is one available called OXFORD PASCAL. This is available on tape or disk for the C64 and C128. It is full specification PASCAL compiler and is fairly fast to use as the computer resides in memory. However, there are not as many features available with it as the disk version.

The tape version sells for about £20 and I last saw it advertised at CALCO SOFTWARE. Tel: (01) 546 7256.
Neil Kendall, Cumbria

Dear Technical Editor,
I'm writing to see if you can help me with a small problem. I'm a British service man posted in Germany. I went out and bought the Final Cartridge III. Not thinking that the instructions book would be in Germany. Can you advise on an address to write to, to obtain an instruction book in English.

Yours,
R. Byer, Germany

Dear R. Byer,
I can only suggest that you contact the shop where you purchased the cartridge and ask them to contact their distributors. We have difficulties in this country with the prohibition of selling backup cartridges as from the 1st August 1989.

Getting Serious with the C64

Jonathan Littlewood tours around Usenext and Bix, on line services for serious users.

The Commodore C64 and C128 have an enormous installed base of machines, having topped the sales charts in many countries. Even now that more sophisticated machines such as the Amiga are available, vast numbers of Commodore's eight bit machines are still in use — not only for games but for more serious activities as well.

Two on-line systems in particular repeatedly act as a reminder of the range of uses that the C64 and its bigger brother fulfill. Usenet and BIX provide on-line meeting points for a wide range of C64 and C128 users. They vary from those learning assembly language programming on an old VIC-20 to those running bulletin board systems on C128's with expansion memory and winchester disks fitted.

Usenet

Usenet is a network of Unix minicomputers that spans the world. It is a kind of global bulletin board, run as a non-profit making service by its users. Messages are mainly passed from one machine to another via leased and public telephone lines, but some of the machines on the periphery of the network get their updates daily or weekly by magnetic tape from a nearby node.

Usenet is organised like a bulletin board. It is divided into a large number of 'news groups' that cover everything from biochemistry to Unix source code and from recipes to the music of the Grateful Dead. It also carries very good Amiga and eight-bit Commodore computer conferences.

The eight bit Commodore conference (comp.sys.cbm) typically receives 25 to 30 new messages a week. Recent discussions have covered bugs found in the Commodore 1581 3.5 inch disk drive for the C64, running a bulletin board system on a C128, and in one case, fitting a C64 with 1764 RAM expansion. Users are even finding uses for their old VIC-20s; one recent article described how the large, clear characters on the VIC-20 display was being put to good use in a Church Message system.

Usenet can be accessed in a variety of ways. Commodore users at universities or other organisations running Unix systems can often arrange free local access. For the rest of us a number of on-line services, notably the CIX Conferencing System in the UK, offer gateways into the system. Again Usenet access is normally free or very cheap, however users still have to pay the charges of the system through which they are accessing Usenet.

BIX

Another good (but to those outside the United States expensive) source of contacts in the Commodore eight-bit world is BIX. Based on a network of mini-computers BIX is a very large electronic Conferencing System.

"The listings section include some software gems, including a Neural Net Simulator for the C64."

As on Usenet, the Amiga users have split off to form their own Amiga conferences leaving the Commodore conference to the eight-bit machines. Topics within the Commodore conference cover the C64, C128, programming and games, and a separate 'listings' section contains about a hundred files for download.

The listings section include some software gems, including a Neural Net Simulator for the C64. Neural nets are computer simulations of how the brain works at a cellular level. At the moment much research effort is being expended on these simulations as they are seen as a possible basis for the architecture of the next generation of computers. The program allows small networks of neurons to be simulated on the C64 and provides a useful way to find out a little about this exciting field.

An advantage of the BIX Commodore conference is that Commodore themselves often look in and many Commodore employees are on-line, though mainly seen in the Amiga conference. The system can therefore be a useful means of contacting Commodore on technical issues.

Accessing BIX from Europe is expensive, due to the cost of the transatlantic link needed. Users with 2400 baud modems can dial direct but cheaper 1200/75 baud modems such as those used to access Compunet will not work as this standard is not used in the US. The easiest way around this is to access BIX through a Packet Switch System (PSS). Such a system allows the user to make a local telephone call to the PSS network, the call is then passed through the network to the host computer. The user pays for the local telephone call, BIX's on-line charges and a PSS charge based on a combination of the time on-line and the amount of data transmitted.

The cost of transatlantic calls can soon mount up and its wise to use a technique known as 'blinking' to make the most of the money. This involves logging on, downloading the areas of interest as quickly as possible to disk, logging off and then reading the new messages at one's leisure.

Replies and new messages can be typed in off-line before logging in for a second time to upload the deathless prose. This method may be more complicated than simple reading and replying on-line but by cutting the reading and typing time on-line can make a major difference to one's overdraft!

J.L.

Win a Day At A Live Role Playing LABYRINTH....

Hey Adventure-Seekers! When you read Andy Moss's review of SLEEPING GODS LIE in this month's *CCI*, the last thing you'll want to do is to lie down! No way - you'll be keyed up and ready for action, and we're going to help you get rid of all that excess energy. There will be three grand prize winners of this month's competition. Each winner will be able to bring one friend to spend a day in live role playing at the LABYRINTH, a live RPG venue, located 20 minutes outside London. All you have to do is to answer the following questions based on the articles in this month's CCI - we'll draw ten winners from the correct entries recieved. Each winner will receive a copy of SLEEPING GODS LIE (AMIGA and PC only) and a SLEEPING GODS LIE T-Shirt. In addition, there will be 7 runners up, who will each win a copy of the game and a T-Shirt. Entertainment International (Empire Software) is the proud sponsor of this month's competition.

But C64 owners need not despair. If you have been reading our Future of Computer Sound series, by Kati Hamza, then you might want to try to win the Amazing Voice Master! One winner from the competition will receive this hardware/software combination which includes: a speech synthesiser so that your computer can talk to you in your own voice; word recognition, which makes your computer respond to your spoken commands; and a voice harp, which is an instrument you play by humming or whistling. The Amazing Voice Master is by Covox, Inc., of Oregon, USA.

Questions:

1. *How many landscapes are incorporated within Sleeping Gods Lie?*
2. *Within which world is Sleeping Gods Lie set?*
3. *In which adventure game does Ace Harding appear?*
4. *How would one set about playing Steve Jackson's FIST?*
5. *Which game offers the option of being one of six heroes?*
6. *What name was given to Texas Instruments early educational toy?*

Answers on a postcard please by Nov. 15 to CCI/Adventure and/or CCI/SAY WHAT!?! Competition, 40 Bowling Green Lane, London EC1R ONE. Please note: winners will be responsible for providing their own transportation to and from the LABYRINTH.

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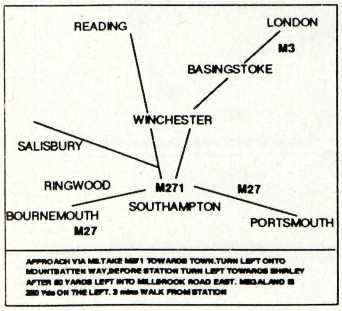

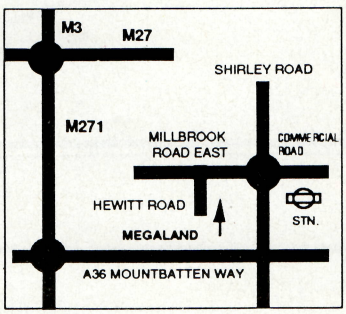

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PSYCLONE

Andy Eskelson reviews a useful cassette to disk upgrade utility for C16 and +4 owners.

The C16 and +4 computers are often ignored by the major software suppliers, but it is still possible to purchase software for these machines. Most of this software is in the form of games, mainly supplied on tape format.

When the users of the C16 and +4 machines upgrade to disk, one of the first things that is done, is to transfer tape programs onto disk. After all that's the whole point of getting a disk drive in the first place!

This is exactly the same problem that was faced by the C64 users when they upgraded to disk. The trouble was that most tape programs used custom fast loaders, and multi part loaders etc. For the C64 user there was a wide range of tape to disk transfer utilities to make this task a bit easier.

The C16 and +4 user has been left out in the cold as far as this type of program is concerned, however Psyclone goes some way towards redressing this imbalance.

Psyclone is a VERY small program, designed to transfer NOVALOAD tape software to disk. The manual states that it will work with 1541, 1551,Excelerator+, Oceanic OC-118 and Blue Chip drives.

The manual also states that Psyclone is a no frills program. there are no title screens, no menus in fact there is NOTHING fancy about this program at all, it does exactly what it is supposed to without any fuss or bother at all.

"The instructions are very clear and are very easy to follow."

To load Psyclone you simply type LOAD "PSYCLONE",8,1 and then the program will load. This will not take very long as the program is less than 400 bytes in length. You then have to enter an SYS number to activate the program. The ONLY thing that happens is that the READY prompt is printed. The screen looks no different to the standard screen.

To use Psyclone you load the tape program as normal. When the program or part of the program has been loaded the screen border turns red and Psyclone is active and awaiting commands. The commands are all simple F-Key presses. They can copy the section just loaded, the largest section loaded, full 16K or full 64K to disk.

It really is very simple indeed. The manual is a draft copy, simple to keep production costs down. The instructions are very clear and are very easy to follow. Very thoughtfully included are a couple of examples detailing a keypress by keypress sequence of what to do when transferring programs.

Psyclone will not work on all programs, but it will work on a large number of them. Multi-part programs can be particulary tedious to transfer, but as the manual states, you will not loose anything by trying!

This is an excellent piece of software, with good instructions. However the best thing about it is the price.

A.E.

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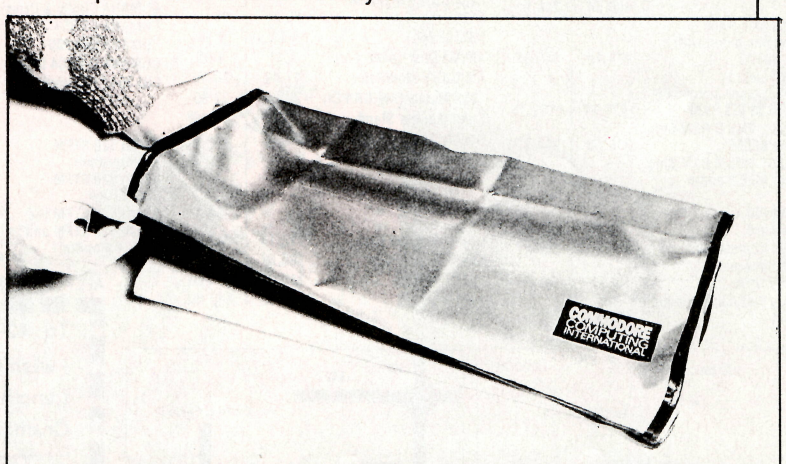

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Programming Techniques #1

Someone's calling you — is it Peter Gerrard?

In the course of the Back to Basics series of articles, which, all being well, is continuing happily along its merry way in some other part of the magazine, I have started up a correspondence or two with just some of the people who are getting to grips with Commodore Basic as supplied with the Commodore 64. One of these people is called Walter Smith (hello Walter!), who describes himself as a programming novice and so I hope he doesn't mind me referring to him in such uncomplimentary terms. Nevertheless he can program, and as a sample of the efforts sent me a Tower of Hanoi program for the 64.

Now I hope you'll forgive me, Walter, if I say that the program was written in the sort of way that I might have approached it a few years ago. I was a novice then (still am, really), but over the years you do get to pick up certain programming techniques that really speed things up. This Tower of Hanoi is a perfect example of that. Walter's listing is liberally sprinkled with a host of IF ... THEN statements, and I repeat that that is the way I'd have tried writing such a program a few years ago. Nothing wrong with it, it works, but there are other, quicker, ways of doing it.

So, courtesy of our noble editor, I hope to show you one or two tricks of techniques over the coming months. Experienced programmers may go "bah! learnt it all years ago". You probably did, but others are still starting out, and there are more people starting out each day. In this first instalment we shall refer to something known as recursion, which can apply in machine code just as much as it can in Basic. I just happen to have chosen a Basic example, inspired by that letter and tape from my mate Walter. Thanks must go here to Colin Evans, who was the first person to adequately explain this technique to me. We all learn from someone!

Walter's Letter

But first, for the one and only person who doesn't know what the Tower of Hanoi is all about, allow me to quote from Walter's letter. He himself is quoting from Kasno, Mathematics and the Imagination, published in New York in 1967. So, to quote ...

"In the great temple of Benares beneath the dome which marks the centre of the world, rests a brass plate in which are fixed three diamond needles, each a cubit high and as thick as the body of a bee. On one of those needles, at the creation, God placed 64 disks of pure gold, the largest disk resting on the brass plate and the rest getting smaller and smaller up to the top one. This is the Tower of Brahma. Day and night, unceasingly, the priests transfer the disks from one diamond needle to another, according to the fixed and irrefutable laws of Brahma, which require that the priest must not move more than one disk at a time and that he must place this disk on a needle so that there is no smaller disk below it. When the 64 disks shall have been thus transferred from the needle on which, at the creation, God placed them, to one of the other needles, tower, temple, and Brahma alike will crumble into dust, and, with a thunderclap, the world will vanish."

"Even 12 disks would take you more than an hour, 17 takes more than a day, 20 takes more than a week, and 28 takes more than a year, so there isn't too much danger of the world vanishing."

Heavy stuff, eh? But no need to panic, dear reader, the world is not about to vanish just yet. As the program example for this month will show us, it is going to take a mighty long time to move all the disks. If the priests average one move per second (agile, these priests) then to move all 64 disks will require something in the region of 590,000,000,000 years, which is quite a long time. If you started with just 31 disks, you might manage it in three score years and ten. Even 12 disks would take you more than an hour, 17 takes more than a day, 20 takes more than a week, and 28 takes more than a year, so there isn't too much danger of the world vanishing. At least, not before the end of this article! How do we know how long all this takes?

Well, if you start with just two disks, it will take three moves (or seconds). Three disks takes seven moves, four disks takes 15 moves, and so on. In other words, the number of moves is related to the number of disks by the formula number of moves=(2 to the power number of disks) minus one.

The program does not illustrate the disks moving, unlike Walter's, which did up to a maximum of seven disks, but being eternally optimistic the listing will cope with 64 disks if you do not fancy doing anything else with your computer ever again in your lifetime, or anyone else's lifetime, come to that. It just shows you what moves to make, and that brings us to the core of our discussion and our program. This is the technique known as recursion, and it involes subroutines. So, here are a few words about subroutines, first of all.

Subroutines

As we were all taught in our infancy, a subroutine is a section of a program that is designed to repeat an action over and over again. The programming keyword that calls the subroutine is GOSUB, followed by a line number. At that line number we might encounter a REMark statement which, while not absolutely necessary, does help to explain what the subroutine is up to. A little while later we MUST encounter a RETURN statement, whereupon program execution returns to the point in the program immediately after the GOSUB statement. A short example should be sufficient to show that in action. We'll start with a single variable and use the subroutine to decrease the vari-

able to zero:

```
10 S=0:A=10:GOSUB 100
20 A=15:GOSUB 100
30 A=20:GOSUB 100
40 END
100 REM ROUTINE TO REDUCE A
    TO ZERO
110 A=A-1
120 IF A>0 THEN 110
130  S=S+1:PRINT  "SUBROUTINE
    ENTERED"S"TIMES"
140 RETURN
```

This is not particularly exciting, but it shows the essence of the subroutine in action. Now, look at the following example before typing NEW to remove the old program and entering this new one and running it. You might expect to generate an error message because, on the face of it, a subroutine cannot call itself. But it can, and if done properly can lead to some interesting programming techniques.

```
10 DIM N(100):INPUT "NUMBER";N
20 N(0)=N:D=1
30 GOSUB 40:PRINT T:END
40 REM WHOLE IS SUM OF PARTS
50    M=N(D-1):IF    M=1    THEN
    T=1:RETURN
60 N(D)=M-1:D=D+1
70 GOSUB 40
80 D=D-1:T=T+N(D-1)
90 RETURN:END
```

This is something that can be done in one line of Basic, but it is the principle that counts. In that one line, we might write:

```
B=0:FOR I=1 TO N:B=B+I:NEXT:
PRINT B
```

All we are doing is adding up all the numbers up to and including our starting number. So, if our starting number was 4, our total would be 4+3+2+1, or 10.

Again, not overly exciting perhaps, but the point to note is the way that the subroutine calls itself in line 70 (the essence of recursive techniques, something calling itself), and the way the variables D and M are used to keep track of where we are. Those of you fortunate enough to have a Basic utility with a Trace function, which will display line numbers as the program is running, will see an interesting thing. You'll also see how to crash the program! If the initial number N is equal to 4, lines 80 and 90 will be executed four times at the end of the program run, to sort out where the RETURN statement in line 90 is meant to go. IF N was equal to 10, lines 80 and 90 will be executed ten times. If N was equal to 43134, the program would crash, because of too many GOSUBs and not enough RETURNs.

The same, fortunately, cannot happen to the Tower of Hanoi listing, as long as you stock to the maximum of 64 disks. Well, I presume so, I've never actually waited long enough for the program to finish running with 64 disks, crashing or not as the case may be. I have been through smaller numbers without disaster.

The REMarks should help to explain what is going on, but if you remain as baffled as I was when I first looked at a listing of this sort, then the best way to follow it is to take a very simple example (say three disks) and follow it through line by line. You'll soon begin to see what's going on. You might also, incidentally, care to change line 170 so that it just reads something like **170 MOVE=MOVE+1:PRINT MID$(STR$(N(D-2)),2,1);"-";MIDS$(STR$(N(D-1)),2,1);" ";** and alter the number 3 in line 180 to a 6, A pattern develops!

Much swifter than a host of IF ... THEN statements, and perhaps more elegant as well. More on this and other techniques at a later date. Bye y'all!

P.G.

★ Program Submission Procedure ★

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ALWAYS include your name, address and date on all material sent.

NEVER use staples, use paperclips if necessary.

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If you are using DISK save the program at least twice and call the second program BACKUP.

IDENTIFY your tape/disk with: your name and address, the program name and WHAT COMPUTER it is for.

PLEASE do not submit hand-written work, unless it is unavoidable. * Note *** you can always write your instructions in the form of a computer program, eg 1 PRINT 'your text' etc.**

INCLUDE a short statement of what your program is supposed to do.

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Overseas submissions can use IRC's International Reply Coupons.

*** Programming Tips ***

If you can, use CHR$(x) type commands instead of graphic characters.

Renumber your program in a standard form, most readers use auto number utilities to ease typing in.

Try to keep instructions within the program fairly short. You can expand on them within the text if necessary

TEST YOUR PROGRAMS..better still get a friend to test them for you.
IF YOUR PROGRAM CONTAINS MACHINE CODE:
Please use DECIMAL data statements, NOT HEX for the BASIC loader. Keep the same number of data statements on each line (MAX 14) and use the three digit format if possible. eg 000,010,243,001 etc.

Basic Aid

Nick Webb C64

This is a nice programmer's utility, in Nick's words, 'to give BASIC programmers a few extra 'tricks' to use in addition to the awful C64 BASIC.' Clear the screen, set border, background and text colours all in one statement, commands to play or 'slide' a note from one pitch to another, position the curson anywhere on screen, and 'grab' any chosen are of the screen and put in anywhere else.

Putting it into memory: enter and save program 1, M/C LOADER. When you run the program, the machine code is POKED into memory. Any errors in the data should be detected, and are pinpointed down to the line. When everything is o.k. and no errors are reported, SAVE the machine code. To do this, type:-
POKE 43,0: POKE 44,192
POKE 45,86: POKE 46,194
SAVE 'CODE',dev,1 (dev is the device number, 1 for tabe or 8 for disk). This will save the code from $C1000 to $C256.

Using Basic Aid in your own programs: (i) incorporate M/C LOADER into your program, so that when run, the first thing the program does is to POKE the data into memory, or (ii) have the first line of the program: IF PEEK (49152)<>32 THEN LOAD "CODE" dev, 1. As long as your program does not use locations 49152 ($C1000) through to 51924 ($CAD4), there should be no problems.

Available commands:
Extended Clear Screen — SYS 49186, border, background, text
Slide Note — SYS 49206, first, second, speed
first = first pitch (0-255)
second = second pitch (0-255)
speed = speed (0-255)
will slide the note from the first to the second pitch. You may also change other aspects of the sound by using the following pokes:
POKE 49250, waveform -> waveform = 17,33,65 or 129
POKE 49232, attack/delay -> ranges from 0-255
POKE 49237, sustain/release -> 0-255
Note: the pitch corresponds to the HIGH FREQUENCY of the note, and all these values can be found in the Commodore 64 User's manual.
Position Cursor - SYS 49286, X, Y
moves cursor to (X,Y) on the screen, similar to the PRINT AT command on most computers,. X can lie between 0-39, and Y between 0-24.
Clear Part of Screen - SYS 49453, X1, Y1, X2, Y2
X1 = x coordinate of top-left corner of block
Y1 = y coordinate of top left corner of block
X2 = x coordinate of bottom right corner of block
Y2 = y coordinate of bottom right corner of block

The 'block' define as above will be cleared. Alternatively, before calling the routine, you can set a character value so that the block will be filled with a character rather than being cleared: POKE 49454, screen code of char. The routine will automatically reset itself to the 'clear' character after use, so there is no need to do this yourself. Note: a 'block' can be anything from a single character square to the whole screen.
Get Block - SYS 496, X1, Y1, X2, Y2
where X1, Y1, X2, Y2 define a 'block' as with 'Clear part of screen'. The block defined will be grabbed and stored in memory.
Put Block - SYS 49635, X, Y
will place a block previously 'grabbed' with 'Get Block' on the screen, with its top left corner at (X,Y). There is no need to worry about part of the block not fitting on the screen -- what cannot be displayed will not corrupt any memory. Examples showing ways in which all of these commands can be used are given in the 'Demo' program.
ERROR CHECKING: the following are possible reasons for a Syntax Error:-
** Wrong number of parameters*
** Any parameters being out of range for the purpose required*
** The 'box' definition for 'Clear part of screen' and 'Get Block' is not given in the form of top left, bottom right, as described*
** You have attempted to use 'Put Block' without first having grabbed an area of screen using 'Get Block'.*
If any of the parameters is less than 0 or greater than 65535, the computer's own error checking results in an Illegal Quantity Error.

```
DGFI 0 IF PEEK(49152)<>32 THEN LOAD "CODE",8,1:REM CHANGE '8' FOR A
     '1' WITH TAPE
CDLK 1 CS = 49186 : REM CLEAR SCREEN
AJCL 2 CP = 49453 : REM CLEAR PART OF SCREEN
HILO 3 PC = 49286 : REM POSITION CURSOR
LMLJ 4 SN = 49206 : REM SLIDE NOTE
BAJN 5 GB = 49600 : REM GET BLOCK
HCJB 6 PB = 49635 : REM PUT BLOCK
DHEM 7 :
NFAL 8 WF = 49250 : REM WAVEFORM
KBID 9 CH = 49454 : REM CHARACTER FOR 'CLEAR PART OF SCREEN'
EJCJ 10 :
GBDL 20 POKE WF,17:REM ENSURE WAVEFORM IS SET
HEOL 30 PRINT "[CD3][SP3]A SINGLE COMMAND CLEARS THE SCREEN"
DFAE 40 PRINT "[SP3]AND SETS BORDER, BACKGROUND AND"
```

continued on page 90

...it's dynamite!

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POWER TOOLKIT

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DOKE	PAUSE	QUIT
DUMP	PLIST	MONITOR
FIND	ILOAD	BLOAD

RENUMBER : *Also modifies all the GOTO's GOSUB's etc. Allows part of a programme to be renumbered or displaced.*
PSET : *Set up of printer type.*
HARDCAT : *Prints out Directory.*

The toolkit commands can be used in your programmes.

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DLOAD	DVERIFY	DIR
DSAVE	MERGE	DEVICE
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MERGE : *Two BASIC programmes can be merged into one.*
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	M MEMORY	W WALK
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H HUNT		

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The HARDCOPY function automatically distinguishes between HIRES and LORES. Multi-colour graphics are converted into grades of grey. The PSET functions allow you to decide on Large/Small and Normal/Inverse printing.
The printer PSET functions are:

PSET 0 - *Self detection Serial/Centronics.*
PSET 1 - *EPSON mode only.*
PSET 2 - *SMITH-CORONA mode only.*
PSET 3 - *Turns the printing 90 degrees!!*
PSET 4 - *HARDCOPY setting for MPS802/1526.*

PSET B - *Bit-image mode.*
PSET C - *Setting Lower/Upper case and sending Control Codes.*
PSET T - *All characters are printed in an unmodified state.*
PSET U - *Runs a Serial printer and leaves the User-port available.*
PSET Sx - *Sets the Secondary address for HARDCOPY with Serical Bus.*
PSET L1 - *Adds a line-feed, CHR$ (10), after every line.*
PSET L0 - *Switches PSET L1 off.*

POWER RESET

On the back of the POWER CARTRIDGE there is a Reset Button. Pressing this button makes a SPECIAL MENU appear on the screen.
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CONTINU - *Allows you to return to your program.*
BASIC - *Return to BASIC.*
RESET - *Normal RESET.*
TOTAL BACKUP DISK - *Saves the contents of the memory onto a Disk. The programme can be reloaded later with BLOAD followed by CONTINUE.*
RESET ALL - *RESET of any programme.*
TOTAL BACKUP TAPE - *As BACKUP DISK but to TAPE.*
HARDCOPY - *At any moment, prints out a Hardcopy of the screen. Using CONTINUE afterwards you can return to the program.*
MONITOR - *Takes you into the Machine language Monitor.*



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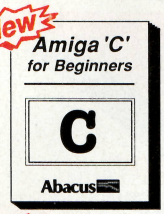

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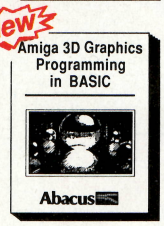

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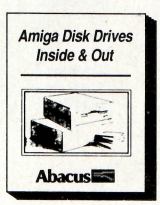

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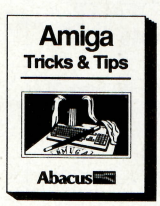

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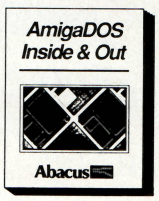

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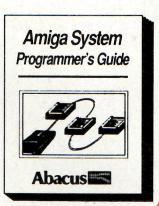

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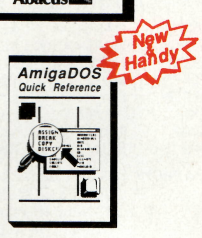

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```
ODFI 50 PRINT "[SP3]TEXT COLOURS...[SP3][PRESS RETURN]"
FLEG 60 GOSUB 1460
EGFG 70 :
ENDP 80 SYS CS,0,0,7:REM BLACK BORDER & BACKGROUND, YELLOW TEXT
FNID 90 :
EEGN 100 PRINT "ANOTHER COMMAND CAN BE USED TO EASILY[SP3]PLACE THE
     CURSOR ";
FMJD 110 PRINT "ANYWHERE ON SCREEN...[WHT]"
JKME 120 GOSUB 1460
CEIJ 130 :
EOLN 140 FOR A=1 TO 200
OHFJ 150 X=INT(RND(0)*40):Y=INT(RND(0)*15)+5:REM CHOOSE RANDOM
     POSITION (X,Y)
GMAL 160 SYS PC,X,Y:PRINT "*":REM PRINT STAR AT (X,Y)
OPPF 170 NEXT A
DHJM 180 :
DEBM 190 SYS PC,0,21:PRINT "[YEL]WE CAN ALSO CLEAR JUST A PART OF THE"
GLGE 200 PRINT "SCREEN USING ONE COMMAND..."
MKMM 210 GOSUB 1460
JJMA 220 :
PAEJ 230 SYS CP,2,7,37,17:REM CLEAR BLOCK, TOP LEFT (2,7), BOTTOM RIGHT
     (37,17)
JGLP 240 :
LAPE 250 FOR DELAY=1 TO 1000:NEXT
JMCD 260 SYS CS,0,0,15
CJGP 270 PRINT "YOU CAN ALSO USE A POKE IN CONJUCTION"
OGEC 280 PRINT "WITH THE COMMAND TO CLEAR PART OF THE"
PNLO 290 PRINT "SCREEN."
DHGJ 300 PRINT "[CD]IT THEN BECOMES POSSIBLE TO FILL PART OF";
FCAF 310 PRINT "THE SCREEN WITH A DESIRED CHARACTER..."
LHBJ 320 GOSUB 1460
AOBO 330 :
BEBI 340 FOR A=0 TO 32
IPOL 350 POKE CH,A:REM SET 'CLEAR PART OF SCREEN' CHARACTER
COAE 360 SYS CP,1,10,38,15
GNBG 370 FOR DELAY=1 TO 50:NEXT
PHMJ 380 NEXT A
BPJO 390 :
NAJF 400 SYS CS,0,0,10
ENDH 410 PRINT "SIMPLE SOUNDS ARE ALSO MADE EASY."
LHPF 420 PRINT "JUST A SINGLE STATEMENT CAN BE USED TO"
MGJN 430 PRINT "PLAY A NOTE..."
ABOH 440 GOSUB 1460
OLJC 450 :
IDLF 460 SYS SN,34,34,1:REM PLAY NOTE WITH HI-FREQ 34 (OCTAVE 5 , C)
OOLI 470 :
JLOC 480 PRINT "[CD]THE SAME COMMAND USED IN A DIFFERENT WAY";
MMLO 490 PRINT "ALLOWS YOU TO SLIDE NOTES FROM ONE TO"
HHPD 500 PRINT "ANOTHER:-[SP5][WHT]UP..."
KKEE 510 GOSUB 1460
HDDD 520 :
BMDC 530 SYS SN,30,61,45:REM SLIDE NOTE FROM OCTAVE 4,A# TO OCTAVE
     5,A# - SPEED45
LDCB 540 SYS PC,14,7:PRINT "FASTER..."
MOBP 550 GOSUB 1460
ECEL 560 SYS SN,30,61,25
CGEO 570 SYS PC,14,8:PRINT "FASTER STILL..."
LLOF 580 GOSUB 1460
```

cont. on next page

```
GKMJ 590 SYS SN,30,61,15
HKBF 600 PRINT "[GRN][CD]AND BACK DOWN AGAIN, AT ANY SPEED..."
JBHH 610 GOSUB 1460
MIBD 620 SYS SN,61,30,30
MOHK 630 :
HGBJ 640 PRINT "[CD][ORNG]BY USING A SIMPLE [RED]POKE[ORNG]
     IN CONJUCTION"
CBAB 650 PRINT "WITH THE SOUND COMMAND, THE WAVEFORM CAN";
KBCO 660 PRINT "BE CHANGED..."
EHAB 670 GOSUB 1460
NNGP 680 :
GCAF 690 POKE WF,17:SYS SN,20,20,1:REM TRIANGLE
JNLG 700 FOR DELAY=1 TO 500:NEXT
EADD 710 POKE WF,33:SYS SN,20,20,1:REM SAWTOOTH
BCHL 720 FOR DELAY=1 TO 500:NEXT
PCFG 730 POKE WF,65:SYS SN,20,20,1:REM PULSE
ICCM 740 FOR DELAY=1 TO 500:NEXT
JBAD 750 POKE WF,129:SYS SN,20,20,1:REM NOISE
FDPB 760 :
JHMI 770 PRINT "[CD]SOUND EFFECTS ARE NO PROBLEM, EITHER..."
JGDI 780 GOSUB 1460
EKLB 790 :
OEGC 800 POKE WF,17
LNFA 810 FOR A=1 TO 4
JFGD 820 SYS SN,100,40,7
MGOD 830 NEXT A
AABK 840 FOR A=1 TO 3
IDHI 850 SYS SN,100,40,7
LIMI 860 SYS SN,41,99,7
GNFE 870 NEXT A
NABA 880 POKE WF,129
FOPC 890 SYS SN,200,200,255
NOCA 900 FOR A=1 TO 8:SYS SN,200,200,10:NEXT A
BPOC 910 SYS SN,100,100,255
HMFK 920 SYS SN,100,0,2
IONG 930 :
BAIM 940 SYS CS,0,0,11
GFEL 950 PRINT " FINALLY COME THE 'BLOCK' COMMANDS,"
JAJG 960 PRINT "ALLOWING YOU TO GRAB ANY RECTANGULAR"
FEBL 970 PRINT "AREA OF THE SCREEN, AND THEN PLACE IT"
OHCL 980 PRINT "ANYWHERE ELSE."
JPFG 990 :
BDNN 1000 PRINT " FOR EXAMPLE, DRAW A COLOURED STRIP..."
DOLG 1010 GOSUB 1460
ILDC 1020 SYS PC,0,9
BEHL 1030 PRINT "[REV][RED] ":PRINT "[REV][ORNG] ":PRINT "[REV][YEL]
     ":PRINT "[REV][LGRN] ":PRINT "[REV][CYN] ":PRINT "[REV][LBLU] "
FPNN 1040 SYS PC,1,5
LKFP 1050 PRINT "[MGRY]GRAB IT, THEN PUT IT SOMEWHERE ELSE..."
DBNG 1060 GOSUB 1460
LEEM 1070 SYS GB,0,9,0,14:REM GET RECTANGULAR BLOCK FROM (0,9) TO (0,14)
LEHL 1080 SYS PB,39,9:REM PUT BLOCK AT (39,9)
HJCG 1090 SYS PC,1,6:PRINT"[LGRY]OR PUT IT IN A LOOP..."
PBEO 1100 GOSUB 1460
GBNK 1110 FOR A=0 TO 360 STEP 9
KJON 1120 X=INT(A/9.2):Y=9-INT((SIN(π*A/180))*10):REM PRODUCE CURVED
     MOVEMENT
OMAI 1130 SYS PB,X,Y
IKDA 1140 NEXT A
LJLI 1150 FOR A=360 TO 0 STEP-9
```

```
BEGA 1160 X=INT(A/9.2):Y=10+INT((SIN(π*A/180))*10):REM CURVE BACK THE
     OTHER WAY
IIFD 1170 SYS PB,X,Y
HGOI 1180 NEXT A
COAH 1190 FOR DELAY=1 TO 1000:NEXT
MAPB 1200 SYS CS,0,0,8
MEBM 1210 PRINT "[CD] OR IMAGINE":PRINT " [YEL]TRYING TO":PRINT " [LGRN]DO
     THIS SO"
CKDM 1220 PRINT " [CYN]EASILY FROM":PRINT " [LBLU]CBM BASIC!"
KBEG 1230 GOSUB 1460
PIPI 1240 SYS GB,0,0,12,6:SYS PB,27,0
MIBD 1250 FOR X=1 TO 3
MJBC 1260 FOR A=0 TO 18:SYS PB,A,A:NEXT A
EDHC 1270 FOR A=0 TO 18:SYS PB,27-A,A:NEXT A
FEBE 1280 FOR A=18 TO 0 STEP-1:SYS PB,A,A:NEXT A
ADNC 1290 FOR A=18 TO 0 STEP-1:SYS PB,27-A,A:NEXT A
PKEM 1300 NEXT X
LKKG 1310 FOR X=1 TO 3
BFEH 1320 FOR A=0 TO 18:SYS PB,A,A:SYS PB,27-A,A:NEXT A
MDIE 1330 FOR A=18 TO 0 STEP-1:SYS PB,A,A:SYS PB,27-A,A:NEXT A
FBPL 1340 NEXT X
ILNB 1350 :
KECL 1360 FOR DELAY=1 TO 1000:NEXT
JDLI 1370 SYS CS,0,0,12:SYS PC,17,11
GHHE 1380 PRINT "END OF":PRINT TAB(18);"DEMO"
ADBG 1390 SYS CB,16,10,23,13
DLJE 1400 FOR A=0 TO 32:SYS PB,32-A,0:SYS PB,A,21:SYS PB,A,0:SYS PB,32-A,
     21:NEXT A
OIEE 1410 FOR A=0 TO 21:SYS PB,0,A:SYS PB,32,21-A:SYS PB,0,21-A:SYS PB,32,
     A:NEXT A
PNPB 1420 GOTO 1400
GOFN 1430 :
GDLH 1440 :
GBCC 1450 :
PJJM 1460 GET KP$:IF KP$<>CHR$(13) THEN GOTO 1460
MLPP 1470 RETURN
S-ENTRY CODE = GBHG

LMOI 1 PRINT CHR$(147)"READING DATA..."
CNFA 2 P=49152
IHPM 3 FOR X=0 TO 42
EPOA 4 T=0:PRINT100+(X*10);:FOR Y=1 TO 14
KEDG 5 READ C:IF C<0 OR C>255 THEN 11
IJMJ 6 POKE P,C:T=T+C:P=P+1
NNMB 7 NEXT Y
CPCK 8 READ A:IF A<>T THEN 11
GEBH 9 PRINT "- OK"
BMPF 10 NEXT X:END
KIFA 11 PRINT "ERROR IN DATA - SEE LINE"100+(X*10):END
IPHK 100 DATA 032,253,174,032,138,173,032,247,183,201,000,208,115,096,1884
LIKB 110 DATA 032,000,192,152,072,032,000,192,152,072,032,000,192,132,1252
NINE 120 DATA 252,104,168,104,170,096,032,014,192,165,252,141,134,002,1826
AJCC 130 DATA 142,032,208,140,033,208,169,147,076,210,255,102,032,014,1768
KLJM 140 DATA 192,230,252,169,001,133,253,132,254,138,229,254,144,004,2385
LBEF 150 DATA 169,254,133,253,169,015,141,024,212,169,009,141,005,212,1906
CJBL 160 DATA 169,000,141,006,212,169,000,141,004,212,142,001,212,169,1578
OFMD 170 DATA 017,141,004,212,138,072,166,252,202,240,007,160,000,136,1747
OIOG 180 DATA 208,253,240,246,104,197,254,240,006,101,253,170,076,089,2437
ICFA 190 DATA 192,096,032,014,192,076,128,192,032,000,192,132,251,152,168
LMMA 200 DATA 233,040,176,240,032,000,192,132,252,152,233,025,176,230,21
```

Continued next month

S-ENTRY

```
100 REM
110 REM*********************************
120 REM*                               *
130 REM*          CCI S-ENTRY          *
140 REM*                               *
150 REM*       FOR THE C64 & C128      *
160 REM*                               *
170 REM*(C)1989,A.ESKELSON & G.CATTLEY*
180 REM*                               *
190 REM*********************************
200 REM
210 M1=256*PEEK(179)+PEEK(178):C8=65281:C9=C8-2:FA=250:FB=251:FC=252
220 POKE C8,00:REM IF 128 SET BANK 0
230 MC=M1+9:CC=0:FOR I=0 TO 61:READ ZZ
240 CC=CC+ZZ:POKE M1+I,ZZ:NEXT I
250 REM DATA FOR CRC
260 DATA 169,000,133,250,133,251,133,252,096,169,000,133,252,162,008,165
270 DATA 250,042,038,253,042,042,042,042,042,069,253,133,253,165,250,069
280 DATA 253,133,253,165,251,042,042,042,069,253,133,253,038,252,042,069
290 DATA 253,106,038,251,038,250,202,208,214,166,251,165,250,096
300 IF CC<>9069 THEN PRINT"ERROR IN CHECKSUM DATA":STOP
310 REM
320 REM TEST FOR C128/C64
330 IF M1=2816 THEN C64=2:SA=3072:GOTO 360
340 IF M1=828 THEN C64=1:SA=49152:GOTO 360
350 PRINT"ERROR NOT C64 OR C128 ?":STOP
360 READ TC:EQ=0:EA=SA:SYS M1
370 HB=INT(SA/256):LB=0
380 REM START OF LOOP
390 READ DA$:REM READ THE DATA
400 IF DA$="-9999" THEN 480:REM FINISHED ALL THE DATA
410 DA=VAL(DA$):PRINTSA;CHR$(145)
420 IF LEN(DA$)<>3 THEN 450
430 POKE SA,DA:SA=SA+1
440 POKE MC+1,DA:SYS MC:GOTO 390
450 A%=PEEK(FA):X%=PEEK(FB):CK=A%*256+X%
460 IF CK<>VAL(DA$) THEN EQ=1:GOTO 480
470 GOTO 390
480 IF EQ OR (CK<>TC) THEN 510
490 POKE FA,LB:POKE FB,HB:POKE FC,C64:SYS EA
500 PRINTCHR$(147);"S-ENTRY ACTIVE. TYPE '@NEW' TO CLEAR LOADER":END
510 PRINT"LINE/DATA ERROR IN LINE";
520 PRINT PEEK(66)*256+PEEK(65):END
530 DATA 44232
540 DATA 024,165,250,105,028,133,176,165,251,105,002,133,177,169,000,170,48900
550 DATA 168,024,177,176,133,254,200,177,176,101,251,133,255,200,177,176,00903
560 DATA 201,255,240,008,024,101,251,129,254,200,208,229,024,165,250,105,18744
570 DATA 112,133,176,165,251,105,002,133,177,024,165,250,105,126,133,254,17887
580 DATA 165,251,105,000,133,255,162,000,164,252,177,176,072,161,176,240,44466
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590 DATA 017,168,104,145,254,165,176,024,105,003,133,176,144,002,230,177,32098
600 DATA 208,230,104,169,000,141,005,003,169,126,141,004,003,169,000,133,49661
610 DATA 252,173,038,003,141,152,002,173,039,003,141,153,002,096,160,000,49456
620 DATA 132,251,132,250,132,180,132,254,132,253,185,000,002,201,032,208,52892
630 DATA 003,200,208,246,201,095,208,017,072,169,171,141,038,003,169,002,22812
640 DATA 141,039,003,032,154,002,104,208,053,072,173,152,002,141,038,003,55274
650 DATA 173,153,002,141,039,003,104,201,064,240,035,201,033,240,013,201,41233
660 DATA 038,208,033,076,068,001,173,141,002,208,251,096,169,067,141,005,20351
670 DATA 003,169,013,141,004,003,169,000,153,000,002,076,013,067,032,128,63881
680 DATA 003,024,144,247,165,252,240,007,169,000,133,252,024,144,236,132,15406
690 DATA 252,152,024,105,004,168,185,000,002,240,007,032,211,001,200,208,05629
700 DATA 245,000,164,252,162,001,185,000,002,072,169,032,153,000,002,104,21893
710 DATA 056,233,065,024,010,010,010,010,133,252,200,185,000,002,072,169,54075
720 DATA 032,153,000,002,104,056,233,065,041,015,005,252,213,250,208,011,11281
730 DATA 200,202,016,210,169,255,133,252,076,209,077,169,000,133,252,162,54224
740 DATA 022,108,000,003,162,001,181,045,149,176,202,016,249,141,001,255,56924
750 DATA 160,000,132,251,132,250,132,180,132,254,132,253,160,001,177,176,45691
760 DATA 240,040,200,177,176,032,211,001,200,177,176,032,211,001,200,177,58968
770 DATA 176,240,007,032,211,001,200,016,246,000,160,000,132,254,177,176,22791
780 DATA 170,200,177,176,134,176,133,177,208,210,160,000,140,000,255,185,63767
790 DATA 154,001,240,022,032,210,255,200,208,245,083,045,069,078,084,082,26008
800 DATA 089,032,067,079,068,069,032,061,032,000,162,001,181,250,072,041,42873
810 DATA 240,074,074,074,074,024,105,065,032,210,255,104,041,015,024,105,62214
820 DATA 065,032,210,255,202,016,229,141,003,255,169,000,141,000,002,076,51028
830 DATA 222,000,096,201,034,208,008,072,165,254,073,255,133,254,104,201,08627
840 DATA 032,208,004,036,254,016,052,133,180,169,001,072,165,251,041,128,08832
850 DATA 042,038,253,165,251,041,008,106,106,106,069,253,133,253,165,251,26391
860 DATA 069,253,133,253,165,250,042,042,042,069,253,133,253,038,180,042,59214
870 DATA 069,253,106,038,250,038,251,104,010,144,208,096,100,000,000,197,16654
880 DATA 000,001,253,000,001,103,001,001,109,001,001,117,001,001,145,001,10659
890 DATA 001,209,001,000,118,000,002,124,000,002,159,000,002,165,000,002,52822
900 DATA 172,000,002,178,000,002,211,002,002,001,003,002,010,003,002,019,14849
910 DATA 003,002,035,003,002,050,003,002,028,003,002,231,002,002,222,002,52909
920 DATA 001,047,003,002,194,002,002,200,002,002,042,003,000,255,255,255,04528
930 DATA 079,165,067,084,124,013,094,124,013,095,165,067,201,043,045,097,06351
940 DATA 115,128,098,000,003,187,138,209,188,164,077,073,141,211,074,002,22835
950 DATA 000,000,064,064,064,064,064,032,000,000,160,000,132,251,132,250,37171
960 DATA 132,180,132,254,132,253,132,177,132,176,096,134,182,132,181,201,46369
970 DATA 013,240,054,166,177,208,037,201,058,176,038,201,046,208,016,072,22106
980 DATA 173,152,002,141,038,003,173,153,002,141,039,003,104,208,018,164,50064
990 DATA 176,153,146,002,230,176,201,032,208,002,230,177,032,211,001,169,15787
1000 DATA 001,166,182,164,181,108,152,002,096,164,177,240,244,169,002,072,30286
1010 DATA 168,136,185,250,000,072,041,240,074,074,074,074,024,105,065,032,48296
1020 DATA 225,002,104,041,015,024,105,065,032,225,002,104,074,144,224,169,27482
1030 DATA 061,032,225,002,169,000,133,176,164,176,185,146,002,201,032,240,17276
1040 DATA 007,032,225,002,230,176,016,240,032,198,000,169,013,032,154,002,25087
1050 DATA 076,225,002,255,44232,-9999
```

C64/128

BASIC COMMANDS

S-ENTRY intercepts several vectors in the operating system, and because of this the normal basic commands are not available.... don't worry... you can still use them by prefixing the command with the @ symbol, so SAVE would become @SAVE etc.

NOTE do not use any DOS wedge, or you will confuse S-ENTRY.

S—ENTRY DISABLE

Before you run any programs that you have entered, S-ENTRY MUST BE DISABLED. Enter an ! on its own and S-ENTRY will be removed from memory and the normal operating system restored. REMEMBER ALWAYS SAVE A PROGRAM BEFORE YOU RUN IT!

MISSING LINES

In order to provide you with a flexible system, S-ENTRY only checks on a line by line basis. So if you miss out line 540 say, S-ENTRY will NOT report an error.

This may sound odd, but it does allow you to enter part of the program, then save it and come back to it at a later date. This is also helpful if you and several friends are splitting up the job of entering a large program, each person will be able to say that what has been entered is correct.

To make sure that you have the entire program, entered correctly Enter type '&' symbol on its own. S-ENTRY will then calculate the S-ENTRY code for the program in memory, you can compare this with the Final S-ENTRY code printed at the end of the listing.

ADVANCED USE

If you think that you are good enough not to use the S-ENTRY system, you can simply enter the normal basic lines after the S-ENTRY code. But what if you get it wrong? Well S-ENTRY has a command that will produce a summary of the S-ENTRY code and the line number in memory, you can then compare this with the published S-ENTRY codes and thus track down the problem. This command is ‹—LIST you can pause the list by using the Shift/Shift Lock keys. The command will also accept a line number range, ie 100-200 or 200— etc.

The ONLY difference that S-ENTRY makes to the published listing is the addition of the four character code before the line number, and the addition of the Final S-ENTRY code at the end of the listing.

S—ENTRY COMMAND SUMMARY

&	Calculates the S-ENTRY code for the entire program in memory.
@	Prefix to a basic command ie @DSAVE or @LOAD
!	Remove S-ENTRY
‹—LIST	Display S-Entry code summary, use shift/shift lock to pause.

YOU MUST

1. Use EXACTLY the same line numbers.
2. Enter the program exactly as printed, including all REMs.
3. Use EXACTLY the same commands, FULL command names MUST be used, ie '?' cannot be used instead of PRINT.
4. Remember to convert the easy enter codes ie [SP9] means type 9 spaces.
5. Type anything between " " (quotes) EXACTLY as published.

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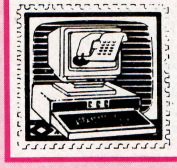

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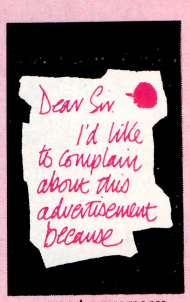

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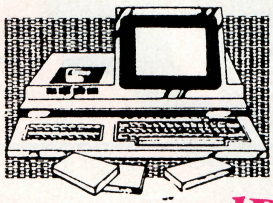

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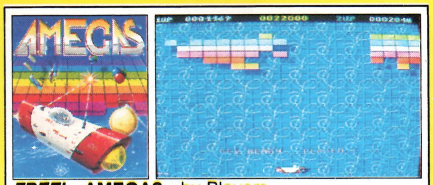

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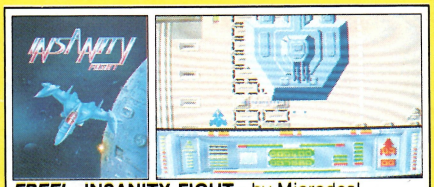

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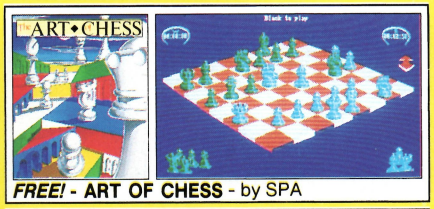

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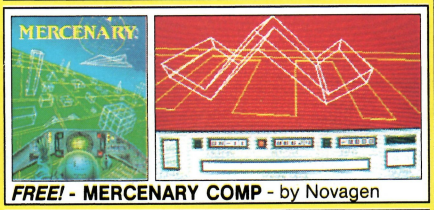

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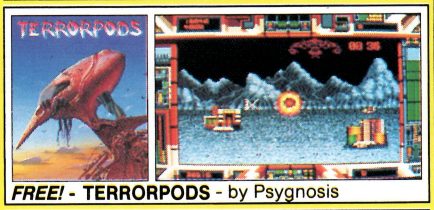

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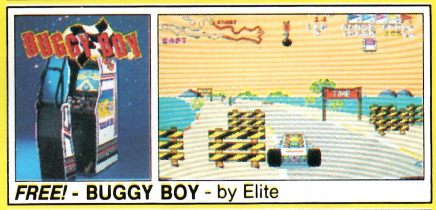

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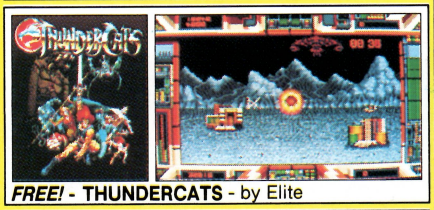

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