

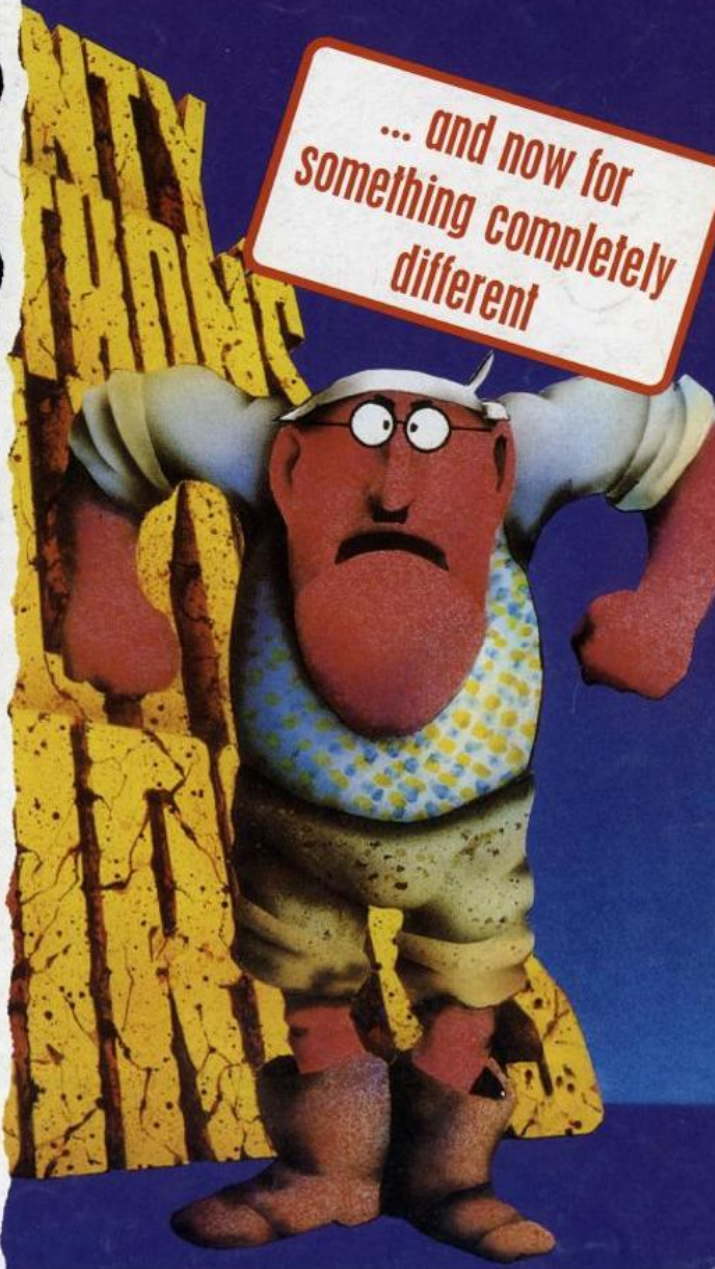
THE PC MAG

plus
**THE
AMSTRAD
USER**

January
1991

Registered by Australia Post
Publication No. VBP7017
National Library of Australia
ISSN - 1035-9516

... and now for
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All enquiries and contacts concerning this Publication should be made in the first instance by writing to The PC Mag, 641 High Street Road, Mount Waverley, Victoria 3149, Australia. Urgent matters can be telephoned through on (03) 803 9661.

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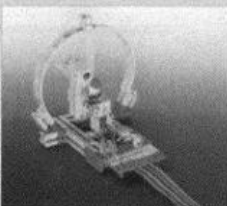
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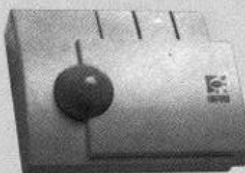
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• Screen shot from Hero's Quest Two, one of the Sierra games to feature in a review in next month's magazine.

NEWSNEWSNEWSNEWS

The latest information from the PC arena.

NEW TASWORD PC

Dolphin Computers has announced the release of the Tasword PC2 Word Processor making it the top of the line Tasman text processing program. All the very popular features of Tasword PC have been maintained but with some significant additions. Users familiar with Tasword PC will attest to its ease of use, minimal key strokes, easy to follow manual and Tutor and great flexibility, all these attributes have been retained.

Additional features in Tasword PC2 include tree structure hard disk directory management, dual file editing, character string find and replace, data base, inbuilt spell checker, password protection, enhanced formatting, user key and trigger words for commonly used words, phrases or even paragraphs, page preview and print to disk, and an exhaustive printer customisation data base to complement the full individual customisation facilities.

Tasword PC remains available and Tasword PC files can be used with Tasword PC2. An upgrade from PC to PC2 is also available.

For further information phone Dolphin Computers on (02) 438 4933 or fax (02) 438 1480.

DATAFLOW RELEASES

Heading the list of new products distributed by Dataflow comes SimEarth - The Living Planet from Maxis, the publishers of the widely acclaimed SimCity - The City Simulator. SimEarth gives players control over the evolution of life, from its origin in the oceans to the development of intelligence, civilisation, and interplanetary travel. Players can create their own planet from scratch with a Random Planet Generator or use one of the seven pre-built planets.

The simulation also represents a new concept in gaming. Although intended primarily as entertainment, SimEarth does not rely on fantasy, but challenges players to solve real-life problems of pollution, famine, global warming and nuclear war. Brian Rosborough, president of the environmental group Earthwatch called SimEarth "a triumph of imagination and technology. It gives you control, for a

moment, of the systems which govern life on the planet and the hope that humans will someday learn to co-operate with nature."

SimEarth is supplied in dual format (both 5.25" and 3.5" disks are supplied in the same pack), supports Hercules Monochrome, EGA, MCGA, VGA and TGA screens and requires 640k in which to run. The product is particularly aimed at adults and children over 12 years of age or students and teachers studying our planet. At the time of writing the price had not been determined.

The Jetsons and Gremlins can now be seen on your home computer with three exciting titles from Hi-Tech Expressions. The Gremlins 2 Print Kit, The Jetsons/Flintstones Print Kit and Beetlejuice Print Kit add all the fun of popular TV and film characters to the creation of cards, banners, posters, storyboards, invitations and more. All three programs include over 60 characters from the movies plus 20 decorative and humorous borders and seven typefaces in three sizes. Available in 5.25" format, they will retail at \$29.95 each.

Three new products have arrived from SmartWorks, the makers of Grade A Educational Software, and all at just \$29.95 each. First Letters and Words (ages 3 to 7) features a revolutionary speech technique where a smart bear talks to children and teaches letters, upper and lower case, colours and vocabulary building. First Shapes (ages 3 to 7) again features the talking bear taking children through shape identification, matching, playing shape recognition games and making toys. Finally, a program which has been designed by teachers and has proved highly successful in the classroom is the Student Word Processor. It provides a report writer, an outline and a calculator in one integrated program and has been dubbed the ultimate student word processor.

Information about all of these products can be obtained from most dealers, mail order suppliers or Dataflow themselves on (02) 331 6153.

NON-STOP POWER

Online Control Pty Ltd have released the Dataguard range of standby uninterruptible power supplies. These UPS units are specially designed for personal

NEWSNEWSNEWSNEWS

computers and derivatives. They are available in a range of output powers from 350VA to 1000VA and all include integral batteries.

The Dataguard range includes network interfacing systems and models designed to power either only the one computer or several computers in close proximity. The units are supplied in an aesthetically pleasing cabinet for desktop or under desk location and are fitted with standard power point leads, as well as sockets to allow them to be plugged in between the normal power source and the protected equipment.

Further information can be obtained from the distributors, Online Control, on (02) 436 1313 or by fax on (02) 438 1480.

THE PLOT CONTINUES

AWA Distribution and Zeta Graphics Corporation have announced a new line of pen plotters with an exclusive ink sensing system. The system, called PenMinder, monitors the ink levels of up to eight plotter pens and when one is sensed to be low on ink, the system automatically replaces it with another of like colour and type. It follows that even the heaviest monochrome plotting can have a high degree of unattended operation as all eight pens can be grouped for sequential use. Alternatively, PenMinder can be run in default mode which will stop the plotting and signal the operator when a pen is depleted.

For more information ring Rick Stanford on (02) 888 9000.

MORE BUBBLES FROM CANON

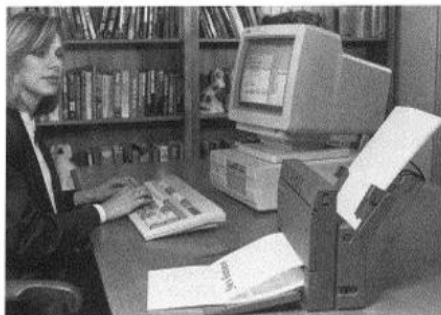
The first shipment of Canon's first bubble-jet printer the BJ-10e, affectionately called the "Little Squirt", sold out very quickly. "The extent of the demand has surprised us," said Alan King, Canon Systems Marketing Manager. "Anyone who wants a Squirt in the near future should place their order now."

The BJ-10e is a battery-powered, briefcase portable and quiet desktop printer weighing only 1.8kgs. The recommended retail price is just \$795 and with optional LePrint Software can produce scalable fonts. A replaceable bubble jet cartridge contains both print head and ink, the latter having a life

expectancy of 700,000 characters - about the size of a hefty novel.

It prints in Courier or Prestige Elite at 83 characters per second on plain paper. A4, letter, legal, envelope or transparency at 360 x 360 dots per inch in high quality mode or 180 x 360 dots per inch in economy mode. It is supplied with a parallel Centronics interface and an input buffer of 37K. The buffer can be made smaller to accommodate a 34k font download area. Optional extras include a 30-sheet automatic paper feeder and a NiCad battery pack, rechargeable through the AC power adapter.

Now "The Squirt" range has been extended to include the BJ330 and BJ300 printers providing faster printing and more paper handling options. The BJ300 is an 80 column printer and the BJ330 a 136 column printer. Both provide compatibility with IBM Proprinter X24e/XL24e emulation as well as Epson LQ850/LQ1050 emulation. The 64-nozzle print head outputs at 150 characters per second printing at 10 characters per inch in high quality mode, with



graphics resolution at 360 dots per inch. The replaceable ink cartridges have a life of around 100 million characters in high quality or 200 million in high speed. They also feature tractor feed as standard equipment, with single and dual bin sheet feeders optional.

For more information, contact your local Canon dealer or ring Canon on (02) 887 0166 or respective state offices.

INTRODUCTION

So What Now?

You have just bought a computer and are confused by your technical know not-how? A little advice on where to start...

The ads would have you believe that buying, owning and using a computer is an affair as simple as buying a fridge. This idea is further reinforced by the way in which most computers are sold: in department stores along with Hi-fi systems, washing machines, kettles and hair curlers. Just as with these, you are given a computer in a box and sold a plug. The rest is up to you.

When I become Minister of State for Information Technology, my first Parliamentary Bill will make it illegal for dealers to sell products without a mental health warning, along the lines of 'Warning: this machine will not operate efficiently straight out of the box without you obtaining significant help and training. It will also consume valuable time and money. You have fourteen days to try this product after which you may return it, in its original condition, for a full refund'. It will be an

offence punishable by Max Bygraves records for dealers to suggest that using your first computer will be simple and painless. The price of computers sold to a novice will include two hours' startup training and three month's telephone support.

Still, by the time I become a government minister, computers will be worked largely by voice, will have the capabilities of a large mainframe, and will be the size of a credit card.

This leaves the novice of today with a few problems. It is not possible in one article, or even a dozen articles, to cover all you need to know. Any advice given here will need to be tempered by common sense and a detailed study of the manuals supplied with your machine. Read and consult as widely as possible before you begin.

UNPACKING

When you get the boxes home, the first thing to do is unpack

everything and check that all the components are there. The manual should have a checklist. New computers are usually sent by carrier and are treated with as much respect as the SAS show for plate glass windows, so check for any obvious damage. Incidentally, keep all the packaging in case you have to return anything at any time. Normally a PC would have a monitor (or VDU - not a nasty disease but a Visual Display Unit); system unit - a large box with at least one disk drive visible; a keyboard; some software on floppy discs; and possibly a printer.

I am not going to take you step by step through the process of putting all these components together. Every PC is slightly different and so I will content myself with a few basic tips.

Firstly, it is most important to restrain your impatience and to read the section in the manual about setting up - read it several times until its meaning becomes clear. In fact, although there appear to be many wires and plugs, you will find that there is normally only one place in which they can each fit. Take your time and don't try to force any plug or connection.

Once you have assembled the machine you will probably be anxious to switch on and get going, but before you do, take the time to understand the basics of making backups of software, loading programs and using the operating system.

THE OPERATING SYSTEM

The computer cannot work without instructions. Unfortunately, computers burble away to themselves in binary code whilst you burble away to yourself in your native tongue, probably some variant of standard English. In order to bridge

DON'T PANIC!

this language barrier, and also to orchestrate the inner workings of the machine, we use an operating system - in the case of PCs, normally something called DOS (Disk Operating System). Yours will be called either MSDOS or perhaps PCDOS, both of which are identical in use.

When a PC is turned on, it performs a few system checks and then looks to a disk drive for the operating system. On floppy disk drive machines it looks to either the upper or left-hand drive which is called Drive A. If it finds the DOS disk it then loads a set of internal commands into the computer's memory and brings DOS to life. Your only indication that this has happened is that you will see the DOS prompt line on the screen.

A >

If you have a machine with a hard disk then it will probably already have been set up with DOS on the hard disk. If it hasn't, follow the installation instructions in the manual when you have finished reading this article. A hard disk machine, when switched on, performs its system checks, looks to Drive A for DOS, finds the disk drive empty and then looks to the hard disk (Drive C) where it will find DOS. Hard disk users will get the following DOS prompt.

C >

This rather enigmatic prompt line actually says quite a lot: *'Hello master/mistress, I am DOS and I have automatically attached myself ('logged on') to Drive A (or C). What would you like me to do next?'* In other words, the prompt line is a command line where you instruct DOS to do certain things such as copy a file or run a program.

Incidentally, don't be intimidated by DOS. Out of the thirty odd programs on the DOS disk, you will only normally need to deal with about eight.

MAKING A BACKUP

The first thing to do before you begin to use your computer in earnest is to back up (make working copies) of all software discs. Having done this, you then put the master discs safely away so that you always have a copy if your disks go wrong.

To make backups, start with your computer according to its instructions and get yourself to the prompt line which will either say A> or C>. You will use the DOS command DISKCOPY. On floppy disk machines, make sure that the DOS disk is in drive A. Now type

```
DISKCOPY A:B:
```

and then press the [Enter] key. From then on it is a case of following the instructions on the screen. Please note that on machines with only one floppy disk, DOS treats that disk as either Drive A or Drive B depending upon the circumstances. The 'source disk' is the one you wish to make a copy of, and the 'target disk' is the one you are copying to. You will have to follow this procedure for each disk, although DOS tries to make life easier by asking you each time if you wish to copy another disk. Once you have made backups of all master discs, you can get down to work.

INSTALLING SOFTWARE

Most software comes with well written instructions about its installation and use. It is usual for modern programs to have a special installation program which you should follow to the letter. Before you begin to install

software for the first time, make a note of the information you may be asked about: Type of monitor, (Monochrome, CGA, EGA, VGA etc.); Type of machine, (PC,XT,AT, PS/2, 386 etc.); Operating system and version number, (MSDOS version 3.3 etc.); Mouse - if you have a mouse, what make is it and is it a serial mouse, (simply plugged into one of the sockets marked 'serial' at the back of the computer) or a bus mouse, (attached via small plug to a card inside the computer).

USING SOFTWARE

Starting a program normally involves typing in its start-up name at the DOS command line, having made sure that the correct disk is in Drive A if you are using a floppy-based system. For example, to start up a program called Simpleton, first find out from the manual what the start-up name is. Let us assume that we are told to type in 'simple'. We would type in the following at the A (or C) prompt:

```
simple[Enter]
```

Your program should then run. Learning to use a computer is the equivalent mental task of learning to drive except that there is less risk of killing somebody. However, the learning curve is the same - long and slow, requiring much practice before full competence is obtained.

The worst that can happen in computing is that you can lose a precious piece of work or damage your software discs in some way. So don't be afraid of computers - they are tools for your use and you should strive to become confident and assertive in their presence. They are at your bidding - not the other way round. ■

Introducing DOS

The first of an instructional series to help the novice PC user become familiar with the computer and its functions.

Back in 1975 a company called Altair produced the first personal computer. By today's standards it was a primitive beast and is long gone in the mists of time. But what we remember it for is that it gave birth to two thriving phenomena. The first of these was the personal computer and the second was the hacker.

Taking the latter first, the hacker has come to be known as the 'bad egg' of computing. The popular press call anybody who breaks into a computer system these days a hacker. To my mind they are just criminals. The true hacker was a person who pushed early machines to the limits and beyond. From these pioneers came the realisation that a lot more could be done with these little toys. So a lot more PCs were made, all different and all unable to use each other's programs.

About this time a hacker wrote a program that would use

a disc drive as a storage medium instead of the magnetic tape that was usually used.

This brought enormous speed gains and became universally accepted as 'the way to go'.

The hacker continued to refine his program and made it available across a large number of machines. This led to the development of programs written to run under this 'operating system'. In turn companies produced software that could accommodate a larger, more common market. This operating system was CP/M, or Control Program for Microcomputers. CP/M dominated the operating system market until 1982, when the world's largest mainframe computer company aimed successfully to produce a larger machine with an original operating system of its own.

This company, IBM, went on to set the standard for both hardware and software for all personal computers to date.

The operating system was known as PC/DOS, or Personal Computer DISK Operating System. The person responsible was Bill Gates, founder of Microsoft, one of the largest suppliers of microcomputer software today.

IBM CLONES

The IBM personal computer spawned a number of imitators that produced work alike machines that ran Bill Gates' operating system which he called MS/DOS, or Microsoft Disk Operating System, and were compatible with the hardware contained in the IBM. These imitations are known as clones and today there are possibly hundreds of them on the market, all usually offering a significant price/performance advantage over the IBM.

COMPUTER JARGON

Herein lies one of the most difficult parts of coming to terms with your computer; The jargon, or terms used to describe the various parts and functions of the computer. Once you have learned the jargon you are halfway home. Certain words have to be learnt to enable effective communication. In other words, we have to develop some common ground.

Before going into specifics it is important then that we have some basic understanding of how the beast works!

WHAT IS A COMPUTER

Put simply, computers model situations. These tutorial notes are being prepared on a wordprocessor and laid out on a page layout program, or as we now call it, a desktop publishing program. These two programs model pen and paper and type setting.

DON'T PANIC!
INSTRUCTION

Computers use numbers and arithmetic to simulate the real thing. To invent a machine to do this requires a great deal of intellectual creativity and mathematical theory. A common ground has to be found to enable it all to come together.

Binary arithmetic provides this common ground. The numbers you and I use are based on the number 10, this is the decimal system or base 10. The number system can be based on any number. Base 10 just happens to be more acceptable to human beings. However you cannot go lower than base 2, the binary system. It is very easy to make an electronic machine that models binary numbers. Binary numbers are written using two symbols 0 and 1. With electronic switches either on or off, this is ideal for modelling the binary system. The step from this to complex calculations is of course huge. Fortunately it is only a matter of building on this base to produce the PC.

THE HARDWARE

The term 'hardware' refers to anything that is visible or that you can handle. Your screen is hardware, as is your keyboard and system unit. Hardware is the generic term for all tangible items. There are special subsets of hardware that are called by different names, but if you follow the above definition, you are heading in the right direction. Some of the special divisions that we are talking about are consumables, which are things like discs, printer paper, disc labels or printer ribbons. They are hardware, but are more correctly called consumables.

Computer Hardware has four main parts:

- . PROCESSOR
- . MEMORY
- . INPUT/OUTPUT (IO)
- . STORAGE DEVICES

THE PROCESSOR

The processor is the brain, or engine. The PC range is based on the 80xx series of chips. Most PC XT Clones use the 8088. Some use the 8086 which is fast. Some use a much faster chip called a 2086. This is a true 16 bit processor and has 16 rather than 8 bus lines. Getting complicated isn't it?

The best way to think of it is like train tracks - lots of busy little engines going back and forth carrying information from the various parts of the computer. The more lines, the faster the work. You can have an XT and an AT both rated at the same processor speed but because the AT or 2086 processor has twice as many lines it is working twice as fast. In instances where there are a lot of mathematical calculations to be done an add on chip called a Maths Co Processor is available, and this does only that one job of solving the equations. Because of this it is very fast.

THE MEMORY

Memory is the storage area. All activity takes place here. Most PC clones have 640k or six hundred and forty thousand storage boxes. The size of the memory determines what can be done. Different models have different memory sizes. The early PCs had small capacities of only 128K or 256K. Program data, and the program itself, all sit in memory. The PC also uses a portion of the memory for its own processes.

THE INPUT OUTPUT

Input/output devices are devices the

computer uses to receive or send information. This includes receiving from the keyboard, scanners, modem lines, mice and other devices. The computer also sends information to the screen, printer, modem lines, plotters etc.

THE STORAGE DEVICE

The disc tape storage is a very important part of the whole system. You can compare it to a filing cabinet where all the information that you prepare with the computer is stored for future use. All the programs are also stored on disc for loading when they are required.

The disc storage can be either fixed or removable. Fixed drives, or 'hard discs', store large amounts of information. The disc surfaces are enclosed in a sealed unit. The whole thing is usually mounted internally and the only way that you know they are there is by a light on the front panel.

The removable discs are either 5.25" or the new 3.5" format. They vary in capacity from 360k to 1.44Mb. The older type 5.25" are soft and should be handled with great care. The 3.5" are totally enclosed and are a much harder medium. The cost of the 3.5" discs is still high compared to the 5.25" but time should see the difference decreasing.

This is a very brief introduction to the PC hardware kept simple as our main purpose is to learn how to drive the beast not maintain it. As you become more familiar with your equipment you will find that it is really a big powerful dumb adding machine that will only do what it is told when it is told. There is no inbuilt intelligence other than what we care to put in there. ■

GLOSSARY

COMPUTER - A machine which executes very fast anything which no-one in their right mind would want to do at all.

PROGRAM - A set of instructions telling a computer how to loop indefinitely or stop unexpectedly.

BUG - Anything which causes the actual results of executing a program to be different to that expected by the programmer. (Aside: If a program which helps a programmer to seek and destroy the bugs which she/he has put into an application is called a debugger, what should the programmer be called?)

FEATURE - Anything which causes the actual results of executing a program to be different to that expected by anyone in their right mind. A bug may be turned into a feature by documenting it.

WORKING PROGRAM - A program from which some of the bugs have been removed. It follows (by a corollary to Murphy's Law) that the remaining bugs are the most wide ranging and catastrophic in their ability to prevent the most potentially useful parts of the program from executing correctly, or indeed at all.

ENHANCEMENT - The process of re-introducing bugs into a working program.

MAINTENANCE - The replacement of one set of hardware error states by a different set of hardware error states. It follows (by a corollary to Murphy's Law) that the new set of error states is more damaging to the correct operation of the system than the old one. Preventative maintenance, carried out by authorised service personnel on a regular routine basis, will result in a steady decrease in system serviceability until the whole machine becomes totally useless on a date pre-ordained by the manufacturer's marketing department. See Obsolescence.

SPECIFICATION - A figment of a salesperson's imagination. The quality of any given specification and its apparent matching to the customer's requirement is dependent wholly on the length of the lunch break and the quantity of intoxicating liquor consumed during it.

USER FRIENDLY - Products described as having these attributes are probably so inefficient, clumsy or lacking in facilities that a pencil is a better investment (given that you already have the back of a used envelope available).

POWERFUL - Well maybe it is, no-one can figure out how to work it!

Some "shorts":

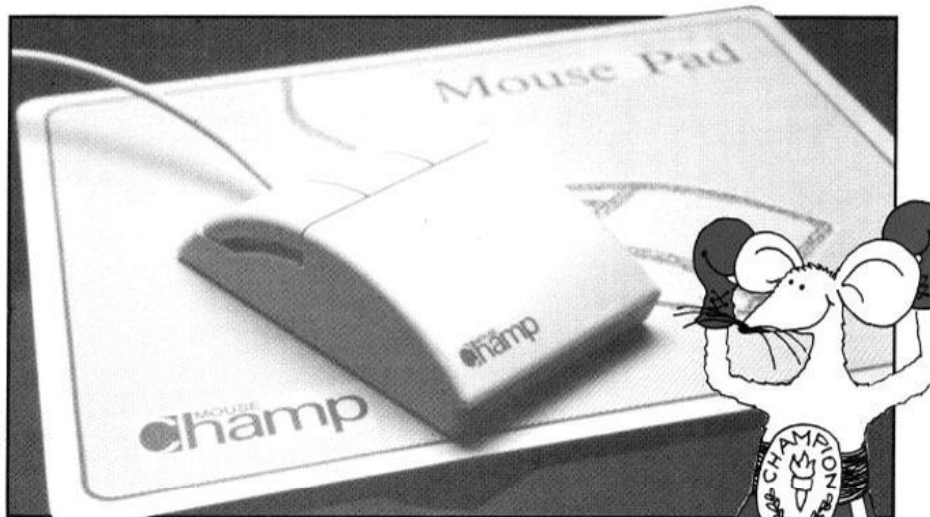
COMPATIBLE - Incompatible
INCOMPATIBLE - Incompatible.
RECURSION - See Recursion

And finally a couple for fellow old-timers:

DRUM, MAGNETIC (Obsolete) A device for the mass storage of angular momentum.

CARD, PUNCHED Another obsolete data storage medium. Data was stored on thin flexible oblong pieces of cardboard, or rather in the form of rectangular holes punched in the cards. The cards themselves served only to hold the holes in place. Punched cards were rendered obsolete by the startling realisation that the holes (and therefore the data) are still there even after the card has been taken away; the cards themselves were therefore totally redundant. As a consequence of the reduction of demand for the high grade wood pulp which used to be used for manufacturing punched cards, all land is now covered with dense coniferous forestry plantations, except that which is already under intensive agriculture or modern housing estates comprising millions of "dream" homes which no-one can really afford.

This mouse knocks the competition out!



Good old fashioned value, futuristic styling and up to the minute software all get together in the CHAMP MOUSE package.

The mouse is an ergonomically designed, futuristically styled device that fits neatly in the palm of your hand and provides controlled, super accurate response. It is both Microsoft and PC Systems compatible, to fit in with all of your existing software. The mouse driver will automatically detect which mode your mouse is set to, and adjust itself accordingly; no more messing around holding down buttons or setting switches! The driver can be adjusted in sensitivity to suit any application; faster movement for general work, or fine, controlled motion for CAD/CAM programs.

Supplied with the CHAMP Mouse is IMAGE 72 graphics software. This is a superior drawing program with more features, commands and functions than any other. It is totally icon driven and can be learnt in minutes. Circle, Line, Polygon, Text, Cut and Paste, Invert, Flip and Rotate are just some of its many, many features.

As a bonus, the package also includes a menu maker and pre-defined menus for popular software packages. The menu maker allows you to create mouse driven "pop-up" menus for ALL of your software, even those that do not directly support a mouse. Menus for some of the best selling programs, such as Dbase, Lotus 1-2-3, Framework, Javelin, Word Perfect, Multimate, Word Star, Symphony and Visicalc are included on the disk.

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ROBOTICS

Arming Your PC

Shane Kelly takes the computer into the age of robotics with the help of Fischertechnik assembly kits.

When you first bought the computer you said to yourself that the kids would find a million things to do with it. You told yourself that they would apply all that technology to improving their schoolwork whilst developing their minds. So far though, there has been a marked absence of anything mind enhancing and it has apparently done little to benefit their future, except perhaps to sharpen their reflexes should we suddenly be attacked by green slimy things from outer space.

I personally don't think that this is the children's fault. The quality of add-ons for computers are generally in the nature of more efficient ways to save Earth from the said green slimy things.

Enter FISCHERTECHNIK kits. The name may be familiar to you as I am told that they have been manufacturers of high quality items for a long time in

Germany, but I had not heard of them before.

Simply put, the FT range is a group of add-ons in kit form that allow children and adults alike to construct specified items and then actually have them do something by programming the computer to make them move. If it must be compared to something familiar, it is well and truly in the tradition of Lego and Meccano, though far more sophisticated. After the user has made one item, she or he can exercise the old brain in thinking of new items that can be built and controlled from the computer. Yeah, well so what if you build your own green slimy thing from outer space? At least it's building and not destroying!!

There are several kits in the FT range starting with a simple printer/plotter up to a full blown three axes robot arm that can actually do useful (depending on your idea of useful) work. The kit we reviewed was the Com-

puting Experimental which allowed us to build and test several different models from a simple winch to a welding robot. Along the way we picked up a great deal about design and how it affects the end product, and how to program an interactive robot so that it does what we want it to do, not what we thought we told it to do.

The kit is impressively boxed in a sturdy plastic affair with cutouts for all the bits and pieces and could well become the permanent home for this unit. There are a multitude of pieces and screws and weird looking engineering type things in the box, but it all came together - just like in the manual - when we attempted to construct the welding robot as our first project. The kit components are mostly grey and red with a few white and black pieces thrown in for good measure. The components are sturdy and look as if they will still be around when little sisters and brothers get to the age where you are trying to wear them off green slimy thing killing. The little motors are a wonder - they are extremely powerful and sturdy, and since without them all you have are static models that is important. Pieces either slide together or are snapped into place, but the quality of construction is such that it would take a barrel of inept monkeys to mangle this lot. Overall an excellent rating for construction and sturdiness.

Having said that, I must warn you that the manuals are no picnic - you will have to be pretty shrewd to fathom out the initial task from the manual alone. We worked out what we were supposed to do by frequent recourse to the many pictures of the models in progress and the finished product. The manuals

REVIEW

ROBOTICS

supplied with the kit are in German, with one English translation of only one manual - the main manual I might add. This at least explains the software component reasonably well. In fact the computing side of things is quite straight forward if you read the manual carefully, and all programs are in GW Basic.

To install the software is quite easy - you just run the program FISCHER.COM and call up GW Basic, then load and run the program INITBAS.BAS. This will search your copy of GW Basic, make necessary changes and write back to a file on disc. After this it is just a matter of loading the program that is appropriate for the model you have built and running it. We had some fun here, continually running our welding robot and then altering some data in data statements to make it perform different movements. This is what the thing is all about really.

The list of experiments described in the manual is pretty comprehensive starting with a motor controlled winch, a reflecting light barrier and radar, all perform their various functions whilst in a stationary position. To really get things mobile, the more advanced Turtle experiments are provided. The 'turtle' is a robot with wheels capable of travelling along a predetermined route or even learning which way to go. In addition, sensing devices such as a bumper or light sensor can be fitted to react to certain conditions.

One point to note is that the kits fit quite a few computers - all that changes is the bit that plugs into the computer and the software to suit your particular machine. So FT may be bought now, and if you upgrade to a

supported computer you need only purchase the new interface/software.

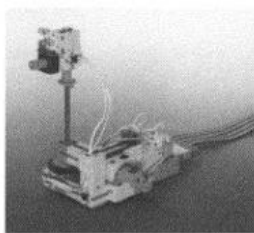
The kits are designed to work with IBM or compatibles with monochrome-standard, CGA, EGA or VGA screens and, of course, GW-Basic. There are also other interfaces and software packs for other types of 'non-IBM' computers such as the Amstrad CPC6128, Apple, Commodore 64, Amiga and Atari. Not all versions are available, but if enough interested people pester the importers, The PC Pty Ltd, then they may well react to the demand.

Kits such as these are so popular mainly because they are not limited to any singular range of age or interests. Not likely to be 'outgrown', they remain to be built upon and spanned across the generations. So what did I think of it all? Anybody who wants to follow a career in engineering, anybody interested in robotics or computer control, anybody who wants a computer to do more than kill green slimy things from outer space; in fact anybody with any imagination at all should check these kits out without delay. ■

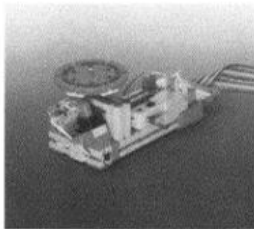
IBM KIT + SOFTWARE	COST
Computing Experimental	\$475.00
Training Robot	\$501.00
Plotter/Scanner	\$463.00
Computing Kit	\$299.00

While the Computer Experimental Kit is supplied complete with a universal interface, adapter and power supply, all the other kits are not. Unless you already have these items they will cost you an extra \$212.

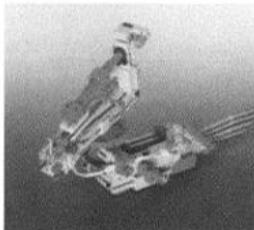
Fischertechnik Computing Kits are distributed in Australia by The PC Pty Ltd on (03) 890 6688 or Fax (03) 890 0884.



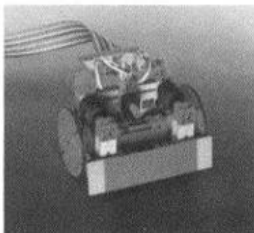
•For measurement and evaluation.



•For measurement and control.



•Robotics welding arm.



•The turtle - mobile robot.

GAME PLAY

On review this month

A-10 TANK KILLER

THE CARDINAL OF THE KREMLIN

ALL DOGS GO TO HEAVEN

SHERMAN M-4

VERDICTS

- ■ ■ ■ ■ Outstanding
- ■ ■ ■ Above average
- ■ ■ Average
- ■ Fair
- Waste of money

A-10 TANK KILLER

- Published by Dynamix • Distributed in Australia by Ozisoft
- Supplied in 5.25" disk packs • Price \$69.95
- Requires 512k and MCGA, CGA, EGA, or VGA screens

Sick of dogfighting and fast fighters like the F-15 and F-16? Want something slower, easier to fly, but with more intense action? If this sounds like you, take a look at the newest release from Dynamix A-10 Tank Killer.

It's based around the A-10 Thunderbolt II and is quite different from any other sort of jet simulator. The role of the A-10 Thunderbolt II is that of C.A.S., or Close Air Support, being primarily to protect and aid ground forces such as the Infantry or the M1 Tank Platoons.

The game opens to a stylised movie like count-in, then an incredible 256 colour VGA opening and credits screens. There is theme music whilst the opening screen and titles are being displayed, although it is a quite disappointingly boring piece of about 8 bars repeated over and over. You can choose to start from the menu screen or continue a campaign, play just a single mission, view a vehicle profile involving all of the ground and air forces from both sides that you will encounter during the simulation, or

view the best missions or campaign results. The menu screen, along with almost all of the other screens in the game excluding the simulation, has a 256 colour digitised picture in the background. More dull music plods along in the background here, also.

You choose a single mission out of a selection, that being limited to five missions altogether, (LHX Attack Chopper has around 15-20 Missions in each of its three areas). You also have a choice as to whether or not your A-10 is invincible, of how difficult the 'baddies' are and an option to have unlimited weapons.

Once you have set the game parameters you then go into a briefing (the same as campaign except that the missions are in order and the baddies are hard so you can expect to be hit). Here you are told your mission targets and (in some missions) any bonus targets that can be taken out once the main objective is reached. Then if you are playing the game in campaign or limited weapons mode, a weapons load screen will appear with a digitised picture of

the A-10, with various assortments of weaponry loaded onto it as you scroll through the setup. Once armed, it's onto the game; you



are planted on a runway and the simulation starts!

The simulation in itself (using the 3space system) works very well, with the digitised picture of an A-10 cockpit directly in front of you.

The landscapes in the different missions have quite complex landforms such as canyons with rivers in the bottom, and bridges over these. The 3space system handles them well with no real slow-downs. I tried it on two different machines, firstly the faster 12mhz 286 with a VGA screen on which the game speed is just perfect, and the slower 6mhz 286, this time with an EGA screen. The graphics



and gameplay were not degraded at all and animation was not noticeably slower. If the graphics and animation are too much for your computer, there is an extra option to firstly degrade the world detail (which doesn't seem to do much), and also to change the playing window size from the full size window right down to a small window of about 25% of the original size.

One problem I did notice on the EGA though was when you are flying along with a mountain on your left side, since 3space is light source shaded, you will have both the ground and the closest side of the mountain to you appearing to be coloured in

the same shade of green, giving the impression that the mountain doesn't have an incline. This can cause confusion when banking and turning around the mountain, and when you are close it is not easy to judge just how far you are from the face.

The weapons seem to perform as they would normally in the aircraft and the avenger cannon is all that it is cracked up to be. It is a seven barrelled GE rotary 30mm cannon pumping out a selectable rate of

2100/4200 rounds the "size of milk bottles" a minute! It carves up whole tanks and anything else on the battlezone that stands in your way, including Soviet Mi-24 Hind helicopters, with incredible ease!

The only thing of any great danger to you that sits on the battlefield is the SA-6, SA-9, SA-11 and SA-13 surface to air missile launchers. They wait in locations where they can become a threat, and believe me the missiles are very, very difficult to evade. The documentation doesn't give you any tips apart from advising you to stay low in order to prevent being detected by the SAM. (I have not yet managed to do

this and have flown at the outer limits of the SAM's range at 25 feet and still been detected). Once a missile has been



launched, try to hide behind a hill (if you can make it there first). If you do pull off the mission you can fly back to base or simply just quit - this is one game where you don't have to land the plane!

Then there's the debriefing, and command Cord (your CO) will inform you on your overall performance, either congratulating or scolding you for your efforts. Finally there is the mission summary screen, displaying your kill statistics, the mission outcome and whether or not you completed the objectives.

This is a game for those people who are fans of simulators but would like a little bit more variation. The game highly impressed me apart from the limitation in the number of different missions, the glitch about the face of the mountain (in EGA) and the more or less dull tone of the music. So if you have \$70, a VGA card and a 8mhz AT or above, and are looking for a difference in flight simulators, this is one game you should certainly have in your collection.

VERDICT ■ ■ ■ ■

GAMES

GAMES

THE CARDINAL OF THE KREMLIN

- Published by Capstone • Distributed in Australia by Pacronics
- Supplied with 5.25" disks • Price \$69.95 • Supports Sound Card
- Requires 384k and CGA, EGA, or 512k and VGA or MCGA screens

Tom Clancy has developed as one of the best authors of recent years. He rocketed to prominence with his first novel, *The Hunt For Red October*, which was made into a computer game by Grand Slam. His second novel, *Red Storm Rising*, received the computer treatment from Microprose. Capstone, from the U.S.A. have locked onto the rights of his fourth book, *The Cardinal Of The Kremlin*, and produced a complex, absorbing computer simulation of a most absorbing book.

The story of *The Cardinal Of The Kremlin* (COK) centres around the US missile defence system. The Americans are trying to develop a laser system code named "Tea Clipper" whilst the Russians are flat out on their own project called "Bright Star". The clock is running and the prize for the first to finish is domination of space and possibly domination of the other super power. As a side issue is the war in Afghanistan, where a rebel who goes by the name of "The Archer", seeks revenge for the deaths of his people against the Russians, and ultimately against the Bright Star ground station. Added to this are CIA and KGB agents operating both in America and Russia, as well

as arms treaty discussions, and you have a complex web of adventure and suspense.

The story of COK is involved, and so is the computer game. Not only do you head the Tea Clipper project and have to recruit department heads for development of the laser, the software and the targeting



▲ One of the most important screens in the game.

your most valuable agent in place is code named The Cardinal, and is the best person to find out about Bright Star by way of position as aide to a political bureau member. Use The Cardinal sparingly because the information given to you is very reliable. If you think that all of this menu manipulation is rather tedious, there are also two sets of arcade action in the game to give the player a bit of a break. The first deals with The Archer. Whenever The Archer attacks the Russians or the Bright Star complex you in control of the

satellite orbiting the earth.

Suddenly another satellite comes into view and blasts the first into squillions of bits of space junk. After the credits it's through the security system and into the game. COK is predominantly menu driven, and suits joystick, keyboard or mouse. The game defaults to the 'regular' game, but this can be altered any time during the first 10 days to an easier level. Your first task is to recruit the heads of the three departments. While they are learning, you can access the other areas, such as initiate the launch of up to four satellites, resupply

The Archer or send out your own agents in place to gain information on Bright Star. You can also set up various tests in any of the the development departments but this early in the game these are almost guaranteed to fail. Also check out the FBI security arrangements, but remember - if security is too strict progress on Tea Clipper will be slower.

Your most valuable agent in place is code named The Cardinal, and is the best person to find out about Bright Star by way of position as aide to a political bureau member. Use The Cardinal sparingly because the information given to you is very reliable. If you think that all of this menu manipulation is rather tedious, there are also two sets of arcade action in the game to give the player a bit of a break. The first deals with The Archer. Whenever The Archer attacks the Russians or the Bright Star complex you in control of the

attack and must destroy as much as you can. The second bit of action happens whenever the KGB decides to kidnap a department head, and then it's into your FBI car for the rescue attempt (if the captive can't be rescued, she/he can always be terminated with extreme prejudice!). The tedium of menu swapping is further broken up by the graphics sequences for tests and satellite launches which seem to pop up at all the wrong times. These graphics can be switched off as they can get annoying after a while.

COK supports all graphics modes, with the VGA and EGA graphics looking very good and clear. COK also supports Ad Lib sound. Control is as mentioned earlier, with the mouse being the best method, but regardless of which control method you use, control during the arcade sequences is via the keyboard. Included in the package from Capstone is the game manual, (with a forward written by Tom Clancy), the user's manual, a shortcut card (which summarises the keyboard commands) and a map which is centred on Afghanistan. The game is in a very good looking package, and there is so much in the program that it will keep you involved for hours.

All things considered, COK is a very challenging and complicated game. It features good graphics and there is oodles to do. Perhaps the only gripe is that there is so much for you to do that it gets a bit too hectic, even on novice level, but it is a good game that will get you involved in minutes then take days to master.

VERDICT ■ ■ ■ ■

ALL DOGS GO TO HEAVEN

- Published by Merit Software • Distributed in Australia by Pacronics
- Supplied in 5.25" disk format • Price \$69.95 • Supports Sound Card
- Requires 256k and CGA, or 512k with MCGA or EGA screens

All Dogs Go To Heaven (ADGH) was a hit movie in 1989, and has recently been released on home video. The story in the film centres around the adventures of three friends - Charlie, Itchy (both dogs) and a little girl named Ann Marie - and their efforts to foil the evil Carface (another dog), and to find a good home for Ann Marie. It's not surprising given the success of the animated movie that a computer game has been developed to allow young fans of the movie to relive that excitement.



There are ten games in the program that makes up ADGH, and they can be played individually (sort of like a practise mode) or as part of the whole adventure. If played as an adventure, each game is connected by storybook sequences, which explains to the player what happens in the story between games. In each game there are three levels of difficulty, which range from novice to champion. Each game can be controlled by either joystick or keyboard.

The first game in ADGH is the Rat Race in Carface's night-club. In this you control a weedy looking rat called Squad



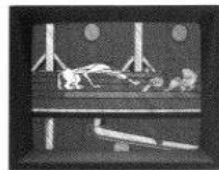
Car, who is trying to win the race. To win, you have to manoeuvre Squad Car left and right on the track, and the only thing he can do is jump over oil slicks. The other rats, however, just go forward and, as you can't pass them, you have to wait for them to fall over before moving past them.

The second game begins just after Charlie has been killed and is floating on a cloud with an angelic dog named Whippet. Moving over Charlie's head are a number of watches and if Charlie can grab the right one, he can live again. You control Charlie in his efforts but be warned; if Whippet sees you you will cop a savage tongue-lashing and have to start again. Once you've got the right watch it's back to earth for Charlie, and in the third game you must convince Itchy that you are not a ghost. To do this, you must catch a flea that is surrounded



GAMES

by blocks. Throw the watch at the blocks to make them disappear so you can get the flea and make Itchy understand that



Charlie is alive again. Charlie and Itchy hear that Carface has captured a monster, and being curious dogs decide to investigate. In game four you guide our adventurers through the air vents in Carface's ship, avoiding detection by Carface's thugs (eh, dogs) to find five, the monster. Our heroes have found the 'monster' in game five, but it turns out to be Ann Marie. Now you must guide Charlie as he places blocks in an effort to form a stairway out of the room that Ann Marie is being held captive in. Blocks can only be placed on ones bigger than themselves.

Game six is another maze, but in this Charlie must catch his watch, which he has lost somewhere in the junkyard that is his home. Game seven takes place in a stable, and Ann Marie is running a word guessing game. You are allowed a number of mistakes in guessing a word or phrase from the movie. In game eight, you must assemble a jigsaw of the junkyard. In this, you are allowed to view the pieces and once selected, a 'beep' is sounded if you try to put the piece in the wrong spot.

Game nine is another maze, and here you help Itchy find a suitable home for Ann Marie. The last game features the final showdown between Charlie and Carface. The two enemies face each other across the deck of

Carface's ship, and by a series of growls and punches you must force Carface off the edge and into the waiting jaws of King Gator.

ADGH is a big game, spread over six 5.25 inch discs. The manual is as detailed as it needs to be, and the pack comes with a free movie poster and sticker. The game has EGA and CGA graphics, but no VGA unfortunately. The graphics in CGA are clear and functional, and in EGA are very colourful. The game animation is good. However, the manual advises not to use EGA graphics on 8086 or 8088 machines, as this tends to slow the animation down. ADGH also supports the various sound enhancement systems, and one of these

would be a must if you want to get the best out of the program because on a standard PC the digitised speech is not exactly the best in some places. The music is okay on a normal PC, but would sound much better through a sound enhancement filter.

Obviously ADGH is aimed at the younger computer user. The games are fairly easy to come to grips with, but there is not a lot of depth to keep the older audience entertained for long. All in all, a good package, aimed at young people and with challenge to keep them interested. Worth a look at kids, if you can get the computer away from your elders for a while.

VERDICT ■ ■ ■ ■

SHERMAN M4

- Published by LoriceL • Distributed in Australia by Pacronics
- Supplied in 5.25" disk format • Price \$49.95
- Requires 512k and CGA, VGA or EGA screens

Perhaps the most famous tank to have been blooded during World War II was the Sherman M4. It saw service in all theatres with most of the allied armies in a number of different variants. In fact, the Sherman continued in service with some armies into the seventies, although it was rebuilt and many times more

advanced than the version that first saw action back in 1941. It is this tank that LoriceL has taken to produce another tank simulation.

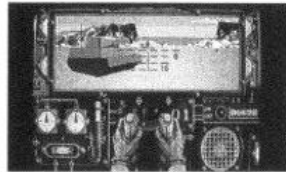
After loading, you are presented with the main menu, which allows you to view the specifications of your M4, and see it in a rotating 3D view



The Sherman M4

GAMES

(similar to the aircraft screen in Fighter Bomber). You can also get the low down on the German tanks you will expect to see during the game, (there are four different types), and you can select one of three campaigns to embark upon. These campaigns are not arranged in historical order, but in order of difficulty. The three campaigns feature Normandy (just after the invasion and breakout), the Ardennes, and the Desert. Each comprises five individual missions that can be played individually, or bridged as a whole



campaign. Upon selecting the campaign that you want to fight, it's timed to set the simulation parameters, such as realism (ie. infinite fuel and ammo and the depth of rivers etc.), the number of allied vehicles, and the skill level of the Germans. You can also alter the German commander, and just for a laugh see how Guderian would have handled the Desert War that Rommel almost won.

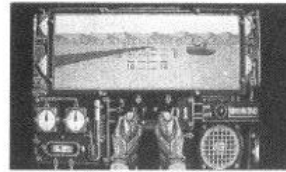
Once into a mission, there are few controls to worry about. All you have to control your tank are forward, back, left and right controls. This can be done either using a joystick or keyboard. Most of the action of fighting the tank takes place in the drivers/gunners seat. An interesting touch here is the fact that the arms of the driver/gunner can be seen on the screen, clutching the control

sticks. The other view is an exterior view, which allows you to look around your tank. Other controls are telescope view, damage report, map and radio. On the map you can select the destination for each of your vehicles, and then program them to move there automatically, (in fact, the whole game can be played directly from the map. The only tricky bit in the game in that respect is setting the range of your main gun correctly).

To fire your gun, the tank must be stationary; you then press "FIRE" and move your control stick back and forward to move the aiming bar up and down. Set this bar where you believe it should be, release "FIRE" and press it again to send a 75mm shell screaming down range towards the target. Also included is a feature whereby the computer will identify what type of object is in sight, and whose side of the war it is on (remember that during the Ardennes, American tanks were used in limited numbers by the Germans). This can be turned off if you prefer. Once you've completed your mission/campaign, it's back to the main menu to do it all again.

Sherman M4 supports all graphics modes. Unfortunately, in CGA Loricel have opted for a combination of red, yellow, green and black, which is a bit of a strain on the eyes. While EGA graphics are good, they lack a bit of the polish that you get with the great VGA graphics. Sound on a standard PC is functional; what you expect really and there is no mention of the program supporting any of the available sound boards (Ad Lib etc.). The packaging states that a minimum of 512K is required to run the program.

I have only three complaints about Sherman M4. Firstly, it's only available on 5.25 inch disc and any attempt to copy the



original discs produced a copy violation message which freezes the system. By doing this, Loricel have put this program beyond the reach of a number of potential purchasers. The second gripe is the choice of the colours presented in the CGA version. Lastly, it's a pity that Loricel didn't put as much effort into translating the game screen messages from French to English as they did in the game manual itself (for example, I was told after completing the five missions in the Ardennes Campaign that I had successfully "wan" the campaign).

Loricel have managed to produce a simulation for which you don't have to read a manual the size of "War and Peace" to get involved in. Although it's not as technically involved or detailed as some of the other tank simulations available, Sherman M4 combines great graphics with a simple game format. You get to decide how much of a simulation the game is, and if you want you can simply play it as an old fashioned war game, straight from the game map. All things considered, Sherman M4 is a playable, enjoyable, pure and simple tank simulation.

VERDICT ■ ■ ■

GAMES

HARDWARE

Hard Driving

Part One of a thorough explanation of the technical features of a hard drive and their functions.

What is a hard disk? The hard disk system consists of two major assemblies - the drive itself and the controller card. The drive is that sealed metal box covered with notices warning the user not to open it. It is attached by a couple of flat ribbon cables to the controller card which is fitted into one of the PC's expansion slots. Hard discs come in different sizes - most are either 5.25 inch or 3.5 inch units designed to fit into the same space used by the half-height floppy disk drive of those sizes. Nowadays 3.5 inch units are gradually taking over from the 5.25 inch designs. Some larger capacity drives are still full-height drives whilst a few one-third height units exist for use in portable computers.

Inside this mysterious box there are a set of disk surfaces or platters, usually made of aluminium about an eighth of an inch thick and coated with

magnetic media. The number of platters varies according to the drive capacity; most half height drives having between 1 and 5, although perhaps 8 or more on a full-height high capacity unit. The coating on the platters can either be an oxide coating or the more modern (and expensive) thin-film or "plated" coating, the latter being applied by a kind of electroplating. These thin-film coatings give a smoother surface allowing the heads to fly closer to the disk which improves the signal to noise ratio and makes greater storage densities possible.

The disk drive is sealed because inside this box the disk heads "fly" above the disk surfaces on a cushion of air just 10 millionths of an inch above the disk surface. That's just about the size of a dust particle. So one speck of dust on

the disk can cause a "head-crash" where the disk head bounces up and then crashes down onto the disk surface scratching the disk coating and wiping out data. Components inside the box can only be repaired in a specially built dust free "clean room" and consequently such repairs are expensive - rarely worthwhile.

For each platter there are two read-write heads that are moved across the disk surface by an actuator motor. All the heads move together over the disk surface which is marked out in a series of cylinders or tracks (the terms cylinder and track are used more or less interchangeably although sometimes writers refer to a track when talking about one surface of a disk and a cylinder when talking about the set of tracks on each surface the same distance from the centre). Since a drive can read a track from the same cylinder using successive heads without moving the



heads to a new location, drives with many heads can access data faster than drives of similar capacity with fewer heads.

VOICE COILS & STEPPER MOTORS

There are two very different kinds of mechanism used to position the heads to the track that you require. Cheaper disk drives generally use stepper motors whilst more expensive voice coil actuators are much faster, quieter and more accurate. Consequently you will see many disk drives with stepper motors which have an average access time of 65 ms (milliseconds) or greater - although newer designs can increase the step rate to get average access times down to 40 ms - whilst more expensive drives using voice coil actuators can have average access times under 25 ms.

Stepper motors, as their name implies, can only position the heads in fixed steps, each

step corresponding to a track position. The trouble with this is that the positioning is temperature sensitive: as the drive heats up metal expands and, although designers try to minimise this variation, the positions it reads and writes when the computer is cold will differ very slightly from those used when it has reached its normal working temperature. Hence we see frequent examples of disk read problems when a computer is first switched on in the morning, especially on Monday mornings in winter if the office heating has been turned off at weekends. Leave the computer running for 15 minutes or so and the problem disappears.

In contrast if the disk was originally low-level formatted when cold you can sometimes get problems if it gets too hot, especially in mid-summer. So if you sometimes get disk read errors when the machine is hot try doing a low level format when the computer is warm.

Because of this variation causing data to be written in slightly different places each time, some engineers recommend that stepper motor drives be reformatted each year or so. I must admit though that I have never done this, but now with the availability of utilities such as the Shareware program

DISKOPT which can reformat drives without deleting the data it might be as well to run this every once in a while.

Voice coil actuators do not have fixed positions for each track. Instead one of the disk drive surfaces is reserved for special index marks and the heads are moved until the index head on this special surface picks up the marks for the required track. Once it has found the correct track it positions the heads exactly over it. Because one disk surface is dedicated to the index marks, voice coil drives always have an odd number of data surfaces.

HARD CARDS

I am often asked about the difference between a hard disk and hard card and which is better. A hard card is simply a 3.5 inch hard disk mounted together with its controller card on some sort of chassis that fits into a PC full length expansion slot. The disk and controller generally use a standard type exactly the same as used in separate hard disk assemblies. A few expensive hard cards use a special one third height drive, but apart from these hard cards are rather bulky and stick out over part of the adjacent expansion slot as well.

A hard card will allow you to keep two floppy disk drives (though I don't see much use in this) or perhaps to install an extra 3.5 inch floppy disk or tape streamer in the front of the computer. It can also be installed in a machine under warranty without affecting the warranty. Maintenance companies and dealers don't like covering hard discs which they have not fitted themselves but in case of trouble a hardcard can simply be lifted out.

HARD DISKS

HARD DISKS

Against this you must decide whether you can afford to lose the expansion slots a hard card would take up.

PARKING

We have noted that the heads on a hard disk drive fly above the disk surface cushioned by a minute layer of air. Unlike a floppy disk drive, the motor on a hard disk continues to rotate all the time that the computer is powered up. When the drive is turned off, the heads will drop immediately back onto the disk surface.

Although designed to land safely without damaging the surface (which is only rotating slowly) it is obviously best if the heads land on a part of the disk that is not used for normal data, and this is particularly essential if the unit is to be transported as the drives can get knocked during transit, causing the heads to bounce up and down on the disk surface. The process of moving the heads to a safe "landing zone" is called Parking the disk.

Newer designs of disk drive, including all voice-coil types, have self-parking heads: a spring mechanism automatically pulls the heads back to their parking position as soon as the power is turned off. On other drives there is usually a program called something like PARK or SHIPDISK which moves the heads to whichever track is designed as a parking zone. Often this is a track number beyond the highest number track but sometimes it is a special area of the disk below track zero. Never use a parking program intended for another kind of drive.

Whether and how often you should use a parking program is in itself a matter for contro-

versy. Some say use one every time you switch the machine off (the Apple Mac takes this line), others, including IBM, say that it is only necessary when moving the machine. Then there are those who claim to have carried a computer about in their car for years without ever parking the heads.

Incidentally a well-written PARK program should enter a loop after running so that the only thing you can do is turn the machine off. Some programs that I have seen return to DOS once the heads are parked. This has the snag that if you have run them from a menu program, or if your MSDOS prompt includes the sub-directory name, the disk will be immediately re-accessed, therefore unparking the heads before you have had a chance to switch off!

THE DISK CONTROLLER

There are three common types of interface between a hard disk and its controller: the ST506 or ST412 which has been used by almost all PC discs up to now, the ESDI and the SCSI interface.

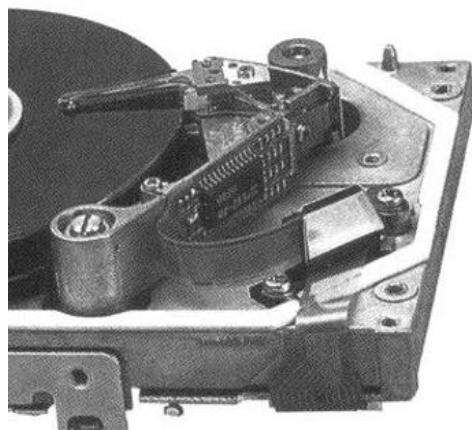
The ST506/ST412 was named after the Seagate drives that first used it although it has since been adopted as a standard by other manufacturers and until recently used for almost all PC drives. Its maximum data transfer rate of around .625 Mbyte/sec (often quoted as 5 Mbits/sec.) has up to now proved academic since no PC motherboards were capable of handling data at this rate.

Recently though high performance computers, based on the 80386 processor, have been turning towards the ESDI (Enhanced Small Device Interface)

which was first designed by Maxtor for use on its high performance drives. ESDI is designed for high data transfer rates (between 1 and 3 megabytes/second). Moving the encoding process (when the digital data is translated into an analogue signal) from the controller to the drive electronics has reduced data errors caused by electrical noise. ESDI has been adopted by IBM for the larger discs on its PS/2 series which by putting up to 36 sectors on a track and using 1:1 interleave factors have managed to achieve data transfer rates of over 1 megabyte per second.

The other interface you will hear of is called SCSI (Small Computer Systems Interface), sometimes pronounced "scizzy", made popular by Apple once they realised that many users were put off by a closed system with no expansion capability. SCSI is not really a disk interface - it is intended for connecting all different kinds of peripherals and a single SCSI host adapter can handle up to 7 drive controllers. These SCSI controllers use either an ST412 or ESDI interface to the disk. ■

Hard Driving will continue to discuss the features of hard drives in next month's magazine, paying particular attention to the differences between



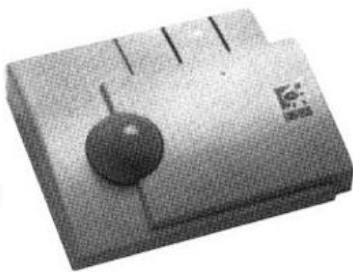
Radical Rodent

Mike Turner reviews Logitech's original Trackman mouse which revolutionizes mouse control to date.

Owners of some PCs are fortunate in that they are supplied with rodents as part of the standard equipment supplied with their systems. Other computer users have to buy these devices as optional extras. So why am I doing a review of a mouse for this magazine? Well I must admit that I had never thought of using any mouse other than the one supplied with my system, that is until I tried the Logitech Trackman stationary mouse. But I was given one as a present, and after installing and using it, my supplied mouse is sitting in the Trackman box in the bottom desk drawer.

What makes the Trackman so different is its innovative design and the various pieces of software that come supplied with it. Let's look at the design first. Basically, the Trackman is an ordinary three button mouse turned upside down. Instead of

moving the whole thing around, you control the movement of your on-screen cursor by means of a trackball. As you can see from the photograph, this is meant to be used with the right hand. The track ball falls under the thumb with the first three



fingers hovering quite naturally over the three buttons.

There are several advantages to this. One is the lack of desk space required to use the thing compared to a standard mouse. It is possible to use it in very

STATIONARY MOUSE

confined spaces, which is a distinct advantage for someone like myself operating my home office from a corner of the family lounge room. With a conventional mouse I found myself often having to pick the thing up and reposition it on my mouse pad, as the lack of movement available hindered the movement of the on-screen cursor.

Next comes ergonomics. After a long work session doing graphics or DTP work with my previous mouse, I found my wrist was starting to get quite tired. The mouse whilst quite attractive to look at didn't seem to be well designed ergonomically to my way of thinking. The sloping design required outstretched fingers and it just didn't feel comfortable for me. I put this down to just being unfamiliar with it and thought I would grow accustomed to it in time. On the other hand the Trackman controls seemed to fall readily under the appropriate fingers. The fact that it remains stationary, means that you can rest your wrist on the desk whilst using it. This is a far more

comfortable method of operation. Left handed people fear not. The supplied software allows you to orient the mouse in different positions on the desk and swap button functions making left handed operation just as easy.

Then there is the aspect of the controllability of the mouse. By this I mean the accuracy with which you can position the cursor on screen and the speed of travel of

that cursor in relation to mouse movement. In both of these the Trackman is superb. I found that the previous mouse interfered with certain pieces of software, particularly those that displayed the date and time on the screen.

STATIONARY MOUSE

This apparently is due to the mouse using the internal systems clock's tick speed to govern its own speed of cursor movement. The problem was solved by using the /s switch when loading the mouse software, but I still found it a minor annoyance. No such problems exist with Trackman. I haven't found a piece of mouse driven software that won't run correctly with this particular rodent.

THE PACKAGE ITSELF

The Trackman comes in three versions to suit either serial, bus or PS/2 configurations. I have seen mentioned that certain other mice won't work with some PCs but will work with other models. I was unable to confirm whether this is true of the Trackman at the time of writing this. I am using mine with no problems whatsoever. However, from the system specifications I have available to me, it would seem that the Trackman is capable of working on most desktop PCs.

Although I would never have guessed it from the manuals that came with my computer, the supplied mouse is a Bus mouse. However it has a propriety mouse port which is totally incompatible with normal Bus mouse connectors. The moral of the story is don't plug anything except a recommended mouse into your mouse socket. System damage may result from such actions. Why am I mentioning this? Well when a friend of mine ordered his, he was asked by the distributor which version he wanted - either Bus or Serial. This is where he ran into a few problems, hunting through the computer manuals searching for the answer. I assure you that the serial version works fine. In fact if you get the serial version, you

have the option of also retaining your supplied mouse attached to the system for dual mouse operation if you feel so inclined. I would assume that the bus version would also work but that any reference to the other mouse would have to be deleted from AUTOEXEC.BAT and CONFIG.SYS files to avoid conflicts and confusions. This would also mean dual mouse operation would not be available as that relies on having one mouse of each type attached to the system.

INSTALLATION AND USE

The exact contents of the package depend on which version you buy. You usually get the mouse unit itself, all appropriate connectors, bundled mouse software and three manuals. The software used to come on dual media disks (i.e. both 5.25 and 3.5 inch). For copyright reasons, only one format is now supplied, so be sure to specify the correct disc size for your system.

The supplied software includes all the necessary drivers to make your mouse work with your particular system. It also includes menu making software. This allows you to use the mouse with normally non-mouse applications. It also allows you to create mouse driven menus of your own for your favourite application or even for executing DOS commands. I am typing this review using WordStar and using the mouse to activate the drop down menus and other functions for me. The software as delivered provides ready made mouse interfaces for over twenty programs. The other major piece of software included is a mouse shell for the popular Lotus spreadsheet program. As I don't own Lotus myself, I tried this out on a friend's machine.

Yes it does work, extremely well. I still prefer the Excel program that came with my machine, but this mouse software goes some way towards making Lotus more user friendly.

The software is self installing and easy to use. The three included manuals are titled "Getting Started", "Getting The Most From Your Mouse" and "Mouse-2-3". They cover every aspect of using the mouse from the basics through to advanced programming of mouse menus and interfacing with various applications. If all that sounds heavy for beginners, don't be alarmed. The documentation is clear and well written.

Those wishing to use this mouse with Microsoft Windows (and you'd be mad not to), will need to reinstall Windows to get it to recognise the appropriate Logitech mouse driver. The mouse works well with all versions of Windows up to and including the latest Version 3.

This review makes me sound like I'm on Logitech's payroll, which I assure you is not the case. As I mentioned earlier, the only reason I ended up with one was due to it being given to me as a present. However, if you surmised that I am enthusiastic about this product, you would be 100% correct. In terms of hardware it is sturdy and well constructed. In terms of supplied software, it is well endowed with useful quality software and documentation. This product would make a great addition to any PC system. ■

The Australian distributors for Logitech are BJE Enterprises Pty Ltd. of Eastwood in Sydney (02) 8585611, and Tech Pacific of South Melbourne in Victoria (03) 6446222.

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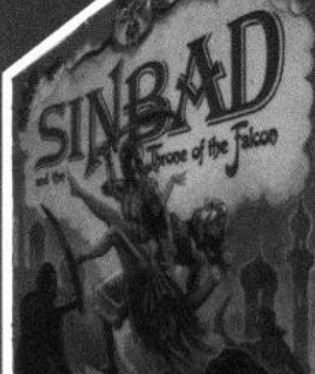
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Being a punter, when I read in the old Amstrad User Mag that there was a punting program due to be released, I thought WOW, now that's a program I'll put on my hard disc. So I called the Ed and said, "Keep one for me Pal".

Well first of all, the program announced in the mag was one written for Great Britain, and as such was not suitable for us mug punters Down Under. So it had to be re-written didn't it?

During the course of the re-writing I was getting a bit impatient, all those winnings eluding me. (You see the system I was using was not going all that well) I made so many calls to the Ed asking, "Where is it?", that I needed a 20 to 1 winner just to get square.

It's
Carni
Pro-F

Avid punter Gus Mercu
version of a suc



Finally it arrived and I logged it on to my hard drive and fired up. This was of course after reading the instructions which consisted of an Instruction Manual, which was written for the original Pro-Punter and not the Pro-Punter II. Some of the information it contained was of use, but most of it pointed to the fact that this was a program written for the 'home' country.

A couple of result sheets, (which were impressive), a testimonial, some favourable reviews from British mags and a three page foolscap size printed both sides instruction sheet on Pro-Punter II.

My problems started when I found that some of the information the program asked for was not available in any racing press available to me in Melbourne, such as speed and weight ratings. Other information required had to be gleaned from at least two sources and in one instance a third. This made

REVIEW

no al for inter

views Pro-Punter II, a new
ul English betting
ser.



the input of data very time consuming, around 40 minutes. Even the reviews in the English press suggest 30-40 minutes.

Then I found that the track ratings in the program were very much different than used in Australia; such as yielding, good-soft, good-firm, soft, good and hard. There was a confi-

dence crisis as I tried to match our fast, slow, dead and heavy ratings with theirs.

Asking for the input of age, market position and the trainer of the previous winner of the race in question, was also a task that didn't get much further than the age of the horse in one racing press, and nothing in the others.

Also asking for the highest value place of the horse in review was not an easy item to find. In fact if you did not have a copy of the race results for the day the horse placed, and got the value from that, it was a very difficult piece of information to get hold of.

Further information requested was winning trainers on the course, and wins by that trainer in the last 14 days, again information not that easy to lay your hands on.

One other item had me scratching my head, and that was the item marked as Advantage, Draw. I never saw that change regardless of the track, condition of the track or the barrier draw, so I put in a race for Moonee Valley at 1600 metres on a heavy track. I then put in 12 horses, all with the same data, except for barrier position, expecting the horses drawn beyond 8 to figure low in the rated horses, but there was no difference. It made me think that the barrier position was not considered, and any mug punter knows you don't put your money on a horse drawn wide on any sort of a track at the Valley. There are exceptions of course, but you could go stone broke waiting for them.

Now after entering every bit of data I could find, I pressed A to analyse the data and come up with a winner and an investment advice prompt.

Whether I did not, or rather could not come good on all the requests for data led to my Investment Advice being NO BET on all the races I put to the program, I don't know. But of the top three rated horses the computer came up with the first Saturday I used it, I had two winners and two placed horses. I only missed not picking a placed horse in one race over the next two meetings. However, I would have had the same results backing the top three horses as listed in the local morning paper.

Now let me say this, before you all get the idea that I am crook on the program, I do believe that DGA software have a good thing going for them, but it seems to me that it is in England where they have some 58 major race courses. So if they, or any other programmer, would really get down to it and look at the difference in the set up here, and write a program to fit our racing in Australia, it should be able to duplicate the English results.

If that happens, they'll find a lot of hard cases, like me, with room on their hard drive to put a money winner. Then I could really say WOW.....

Given the popularity of Australian racing, it is assumed that there are likely to be one or two racing programs around that we have yet to hear about. If this is the case, we'd appreciate feedback from any readers who know of or are able to get their hands on such a program. Information regarding the performance of the programs would help!

REVIEW

GET the Picture?

Part Three of the GW Basic Graphics series by
Gary Koh discusses the GET/PUT
and VIEW commands.

This is the third part of our series on graphics commands in GW-BASIC.

This month we will begin looking at the last five graphics commands, starting with VIEW.

VIEW is a relative of WINDOW, whose job it is to deal with creating windows, or viewports as the manual calls them, on the screen. This window is a smaller area of the whole screen, a window of it, in which graphics are confined. That means that if you draw something and part of it ends up being outside the window it will not get drawn, even if it would still end up on the physical screen. The window you define has to be within the confines of the physical screen and not outside of it.

The format of the VIEW command is

```
VIEW (X,V)-(X2,V2),  
FILLING,OUTLINE.
```

The coordinates are defined

much the same as the box form of the LINE command. That is, they define the opposing ends of the window you want to define. FILLING and OUTLINE are optional. Both refer to colour numbers, but in different ways. FILLING is the value of the colour you want the window to be filled in. OUTLINE, if specified, draws an enclosing box around the window in the specified colours.

You can also include the word SCREEN after VIEW. If left out it will make the coordinates of subsequent graphics drawing relative to the viewport window. This is like transferring the entire screen into the viewport. When doing this you have to be careful to preserve the aspect ratio to a close degree, otherwise things do not turn out as you might expect them to.

Remember the CIRCARC program from the second GW Basic Graphics article? Load that in, then type in the follow-

ing lines, one at a time, run the program, and see what happens with each different command.

```
185 VIEW (1,1)-(319,174),3  
185 VIEW (1,1)-(159,87),3  
185 VIEW (1,1)-(500,120),3  
185 VIEW (1,1)-(200,250),3  
185 VIEW SCREEN(200,50)-  
(420,230),3  
185 VIEW SCREEN(1,1)-  
(319,174),3
```

See what happens with different windows and adding in SCREEN? This command can be very useful for scaling and certain applications. You could use it for a zoom back effect. Another thing would be to use it, say, to display up to four things on the screen that normally take up a whole screen in each of the four quadrants.

Note that CLS only works on the VIEW area, not the whole screen. Normally the view area is the whole screen. VIEW by itself or RUN will automatically change the viewport window to encompass the whole screen.

PMAP is a related command to VIEW. Like POINT, it is a function, whose job it is to handle conversion of coordinates from those set by WINDOW to those set by VIEW. The format of this command is

```
VARIABLE=PMAP (COORD,  
CONVERSION).
```

COORD is the value of the coordinate you want to convert. CONVERSION has a value of 0 to 3, specifying which sort of conversion you want.

O converts an x coordinate from VIEW to WINDOW format. 1 converts a y coordinate from VIEW to WINDOW format. 2 and 3 do the same jobs as 0 and 1 respectively, except that they convert in the reverse direction. I have not actually come across a use for this

TUTORIAL

command, so cannot give any examples.

GET and PUT commands are related to each other. These two commands deal with getting and placing graphics blocks around the screen, producing animation and other things.

GET takes a chunk of the screen and puts it into an array. PUT then allows you to place this graphic that you have stored back onto the screen. PUT is effectively like a sprite placing routine, while GET is a capture utility to help get the graphics for PUT to use.

The format of the GET command is

```
GET (X,V)-(X2,V2),ARRAY.
```

The set of coordinates specify the rectangular area of the screen which you want to store. ARRAY is the array in which you want to store the graphic.

The array can be of any numeric type, integer, single precision floating point and double precision floating point. However, before you put anything into the array you have to make sure it is the right size to hold all the graphics information. To work this out requires some calculating. Using GET and PUT to their full potential requires some knowledge of how the screen works. GET and PUT, in comparison to all the other graphic commands, do not have much to do with mathematics, although they can be scaled with VIEW.

To calculate how many bytes needed to store the graphic in you must use this formula:

```
4*INT (XLENGTH*RESOLUTION)/8)*YLENGTH.
```

XLENGTH and YLENGTH are the dimensions of the area you want to capture, in screen pixels. RESOLUTION is the

amount of bits that are needed to encode one pixel in that particular screen. This is the value that governs the size of the graphic in terms of colour. Screen 2 has a value of 1, because there are only two colours. Screen 1 on the other hand has a value of 2, and all the EGA screens, 7, 8 and 9, with their 16 colours have a value of 4. For example, in screen 1, if you want to capture a 16 by 32 area you would need 132 bytes of storage.

```
(4*int(16*2)/8*32)=132)
```

Each element in an integer array occupies 2 bytes. In a single precision array each one occupies 4 bytes, and in a double precision array each one would take up 8 bytes. Therefore, if you had an integer array you would need 66 elements. For a single precision array you would need 33 elements and for a double precision array you would need 17 elements. That is just the minimum amount you need. You can have your array larger if you want. It is best to use an integer array because you can examine the dimensions of the graphic you captured directly from the array. The first element holds the x dimension, the second the y dimension. The format of the PUT command is

```
PUT (X,V),ARRAY,IMAGE.
```

The IMAGE parameter is the only optional one. X and Y are the coordinates at which you place the graphic onto the screen. ARRAY is the array which holds the graphic. IMAGE offers several different ways of placing the graphic onto the screen. IMAGE is not a numerical value but a word.

If IMAGE is PSET then the graphic is force-printed onto the

screen. Anything under the image is erased. PRESET does the same thing except that it prints a negative of the graphic. The last three are AND, OR and XOR. They refer to the well known logic functions which work on bits. AND has the effect of only allowing bits of the image onto the screen if they already exist there. OR superimposes the object on the screen. XOR has the property in that if you PUT the graphic back in the same place where it was it will erase it, without affecting the background at all.

GET and PUT work faster if the x coordinate of the graphics you capture using GET are divisible by 4 in screens 7, 8 and 9, by 8 in screen 1, or by 16 in screen 2. This is due to the way the graphics are stored. When storing graphics you have to think in terms of bytes, not of pixels. To explain this would require another whole article. If you do not understand this then just accept it as it is and forget about bytes and things.

GET and PUT seem to be quite useful. However their usefulness is tempered by one barrier; memory. In GW-BASIC you are limited to under 64Kb, which has to accommodate both program and data. With CGA, where images do not take up much space, things are not too bad. In EGA though, things become quite squeezed. For the same sized image you need 7 times as much space. An entire EGA screen will take up 112kb of memory. Obviously, you cannot store very much of a whole screen. This puts writing things like WIMP environments in EGA out of the question, because there is not enough memory to accommodate pull down menus and such on screen.

TUTORIAL

The following program shows what GET and PUT can do. It only works in Screen 1, because of the difference between screens and the fact that GET and PUT are largely incompatible across the different screens.

```
100 * Example program for GET and PUT in screen 1
110 *
120 SCREEN 1
130 CLS
140 KEY OFF
150 WINDOW (0,0)-(319,199)
160 *
170 DIM CIRCGRAPHICS(270)
180 CIRCLE (104,100),15,1
190 CIRCLE (104,100),14,2
200 CIRCLE (104,100),13,1
210 CIRCLE (104,100),12,2
220 CIRCLE (104,100),10,3
230 PAINT STEP(0,0),3
240 GET (88,115)-STEP(31,-31),CIRCGRAPHICS
250 CLS
260 *
270 GOSUB 520
280 FOR YCOUNT=50 TO 140 STEP 12
290 FOR XCOUNT=0 TO 280 STEP 5
300 PUT (XCOUNT,YCOUNT),CIRCGRAPHICS,XOR
310 FOR DELAY=1 TO 6:NEXT
320 PUT (XCOUNT,YCOUNT),CIRCGRAPHICS,XOR
330 NEXT
340 FOR XCOUNT=280 TO 0 STEP -5
350 PUT (XCOUNT,YCOUNT+6),CIRCGRAPHICS,XOR
360 FOR DELAY=1 TO 20:NEXT
370 PUT (XCOUNT,YCOUNT+6),CIRCGRAPHICS,XOR
380 NEXT
390 NEXT
400 *
410 CLS
420 VIEW SCREEN(1,50)-(318,150),,3
430 GOSUB 520
440 PUT (3,100),CIRCGRAPHICS,PSET
450 PUT (60,100),CIRCGRAPHICS,PRESET
460 PUT (120,100),CIRCGRAPHICS,XOR
470 PUT (180,100),CIRCGRAPHICS,AND
480 PUT (240,100),CIRCGRAPHICS,OR
490 LOCATE 21,1:PRINT*PSET PRESET XOR AND OR*
500 END
510 * Draw line background
520 FOR XCOUNT=0 TO 319 STEP 3
530 LINE (XCOUNT,0)-(XCOUNT,199),XCOUNT MOD 4
540 NEXT
550 RETURN
```

The first thing that it does is draw the object, which consists of circles placed inside each other.

It then stores it using GET. In the first display it does show animation, moving the object back and forth across a background of lines without disturbing it. This is done using the XOR function.

As you can see, the animation is not particularly all that fantastic. It is a bit jerky, although fairly smooth. Secondly, it is not all that fast. Speed is a real problem to judge, with different machines running at different speeds and with different graphics screens. Generally, even on an XL animation in CGA should be quite alright.

The problems really start to happen in EGA. If CGA is only adequate, you can imagine what EGA, with seven times as much to shift, is like. Even with an AT, trying to do EGA graphics is slow, and that is on top of the fact that EGA graphics take up so much room.

This depends on what you are trying to do. If you only have very small objects then they can end up looking good, even in EGA. Moving them in large steps can speed things up, as seen in the program, although it makes things jerkier.

After the program finishes moving the object across the screen it then prints the object in each of the five different formats, inside a box created by VIEW. This is labelled underneath so you know which style is which. This should help serve as a guide as to what each format does.

You need not use these two commands just for animation. There are other things you can do with them, like storing parts of the screen. Drawing type programs and WIMP environments would benefit from this. However, the problem of lack of storage becomes apparent, forcing you to use CGA when you could use EGA.

There are also extra problems where animation is concerned. To get an object, you have to capture it from within Basic. That means that you have to draw it using only Basic drawing commands. That is alright if the object is simple, but if you try to produce detailed sprites you are going to be in big trouble.

The only way out is to write your own sprite editor, or get another language (and watch your bank balance go down!). Writing a sprite editor is no simple task, requiring a good depth of knowledge about how your computer works. Then you must also contend with the different screen modes. Who ever said life was easy? ■

In February's issue of The PC Mag, the GW Basic series will continue with the final installment of the graphics commands feature. GET the Picture 2 will discuss in detail the DRAW command.

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Miracle Cure

Chris Collins' regular review of PD/Shareware releases, this month including Virus Tools programs, games, and more.

Welcome to the New Year, and welcome to yet another edition of Compatibles Corner. It is now 1991, and you should be getting over the rigours of Christmas.

Onto this month's column, we have some news about the Virus Tools diskettes (yes, Virginia, I did say DISKETTES), programs to help WordPerfect users get even more out of their favourite word processor, and a collection of games. Let's start with news about the Virus Tools diskettes.

VIRUS TOOLS

Virus Tools has managed to grow to two diskettes now with the release of v67 of the McAfee tools. There are now two new McAfee tools on the diskettes. One is called FSHLD13.ZIP and is downloading of the Bulletin Board as I write this. The others are called Resq and Sentry.

Resq should probably not be on VT, but on a new version of Vaccine Programs, but it is so

good that I thought it only fitting that it appear here. Resq's full name is Virus Rescue, and it is a menu driven front end to control SCAN, CLEAN and VIRLIST.TXT. It is also a help system from these programs.

Sentry is similar to VShield, except that whereas VShield only checks 4 files, (IBMBIO.COM or IO.SYS, IBMDOS.COM or MSDOS.SYS, COMMAND.COM and VSHIELD.EXE), Sentry looks at all of the executable files on your hard disc. It also looks after the partition table and boot sector. This it does by taking a snapshot of the system after being installed, and then comparing that snapshot every time the system boots.

FSHLD13 is also called File Shield and is designed to do a similar job to Sentry, except that it only looks after COM and EXE files. Both programs work in similar ways, and do need to be installed for each system. If you change your system, as de-

scribed in the documentation, you must re-install the program that you are using again.

The rest of the McAfee series have grown to v67 and NBY (Not Born Yesterday from Calmer Software) has now been updated to v113. Enjoy the extra protection.

Fortunately there is still some room on the second diskette, so as the programs get larger, we will be okay for a while yet!

TOMMY'S GAMES DISCS

This collection of five diskettes is from a company called Tommy's Toys in the US of A, and comprises approximately 13 games. I will give you a quick run-down on the diskettes by number, and you can see what you like. Remember that these games don't operate in graphics modes, but they do use the graphics characters that are available in the ANSI character set. They will work on any screen, whether it be CGA, EGA, VGA or Monochrome.

TOMMY'S GAME DISC 1

The first diskette in the series has three games on it. They are as follows;

GORILLA BALLS:- These crazy gorillas chase you all over the screen. At the same time, the playing area is getting smaller due to shrinkage.

GIN RUMMY:- The simple card game, but with a few computer twists added to make it easier for you to play. For example, the computer will always sort your cards to give you the best hand possible, and will suggest when to knock.

WHEEL OF FORTUNE:- A simple rendition of the Wheel of Fortune game, which apart from the lack of graphics, is probably the closest rendition of the game that I have seen.

TOMMY'S GAMES DISC 2
Diskette number 2 in this series has the following games on it: **TREK**:- This is a faithful rendition of the older version of Trek as it would show up on a Teletype machine. The game plays well, and is easy to play, and will show most of you how the original version of the game looked on the old machines. **SAUCER**:- One day an alien space saucer crash landed in Tommy's backyard. Whilst helping the aliens to repair the ship, Tommy stole a copy of the manual and has built himself a copy of the ship. Unfortunately, not all of the controls were able to be deciphered into English, so things may get a little hairy when you fly the ship.

TOMMY'S GAMES DISC 3
The third diskette in the series contains the following games: **METEORS**:- Falling meteors hitting the buildings, and trying to wipe you out at the same time. The longer you stay alive, the more points you get. **PANELS**:- Haven't been able to get this one working yet, but from the documentation, it sounds okay. Will better know shortly which file is supposed to be missing. **TOMMYS21**:- A collection of 21 point card games that can be played under different rules. These rules include American Blackjack, British Pontoon and two others. You start off \$1500 odd in the red, and have to get into the black. I managed to get to \$5625 before I stopped playing Blackjack. The program is good!

TOMMY'S GAMES DISC 4
Diskette 4 in this group of 5 has only one game on it, and that is called Trivia. Trivia gives you the option of five different ways

to play the games, including 50 questions, Jeopardy and three others. All questions are of an American bent, due to the origin of the program, so you need to know American history to do well. Good fun all the same.

TOMMY'S GAMES DISC 5
Games disc 5, the last in this series has only 2 games on it, and these are described below; **HWORDS**:- This program generates lists of words, and then creates hidden word puzzles. You know the style. A large grid of letters in a square or rectangular pattern that seem to mean absolutely nothing, until you look closer. You also have a lot of control over the rules governing the layout of the grid. **XWORDS**:- This is a crossword puzzle type program. It has the ability to store 100 puzzles in each of 26 categories. This allows you to keep heaps of puzzles, but not take very long to find any particular one. You are able to describe each puzzle with up to 35 characters. There are 39 sample puzzles on the diskette in the X series for you to start learning with.

All in all, the diskettes that comprise the Tommy's Games Discs contain some excellent games. They are not the most graphic games available, but within the limit of the ANSI character set, they excel. It goes to show how people got on with computer games before we went graphic. Good to have a look at, and will work on any computer.

GOLF GAMES

Whilst we are still in the mood for games, I have managed to find a couple of Shareware golf games. One is called Pro-Golf and is a normal style golf game similar to Mean18. The second is called Miniature Golf and is a

putt-putt style of golf game. They are better described below: **Pro Golf**:- This game is a cross between Mean18 and World Class Leaderboard Golf. It uses the best features from each to create a reasonable golf game, but with a few exceptions.

Because it is released to run in CGA, there are only 4 colours to choose from. This makes it very difficult to distinguish between items on the course. The second observation is that all play takes place from above the fairway or green. This is totally different from both of the golf games mentioned above.

Apart from these two observations, the game plays well and allows you great control over the clubs that you use, the amount of power supplied, and the direction in which the ball is to be hit. There is one course supplied on two diskettes that comprise Pro-Golf, and when you register you get a second course and the Golf Course Construction Set. This allows you to create a course, limited only by your imagination.

Miniature Golf:- This is a simple putt-putt style golf game. Again, because it is written to run in CGA, it is limited by the graphics capability of that system. It uses block graphics for the course, and some of those are difficult to play. It allows you to play the ball in any direction, and also specify the amount of power to supply to the ball when you hit it.

I found it hard to get around this course in anything approaching par, but then I have trouble at the real putt-putt as well. Good fun for lovers of golf.

WORDPERFECT DISKETTES

There are three diskettes that I wish to discuss that will work with WordPerfect v5.0 or

WordPerfect v5.1. These are WPTools, Mail Perfectly and WordPerfect Graphic Images.

WPTOOLS V3.0

WPTools is a diskette containing 13 tools to help users of WordPerfect v5.0 and WordPerfect v5.1. These include the following utilities which are very quickly described; **DISKFONT**:- Searches a directory from specified soft fonts and optionally lists descriptive information about the fonts that it finds.

FIXPRE:- Removes deleted data packets from the prefix of WordPerfect v5.0 and WordPerfect v5.1 document files. Also removes the deleted data packets from the WordPerfect v5.0 and WordPerfect v5.1 set-up files. **FONTFILE**:- Lists the names of soft fonts specified in a PRS file. **FONTLIST**:- Lists the names of the fonts used in a WordPerfect v5.0 or WordPerfect v5.1 document.

LISTMACS:- Lists the names and descriptions of macros in WPM and WPK files, optionally sorted. **MAKETABS**:- Converts an ASCII text file to a WordPerfect v5.0 document, replacing spaces with tabs.

MERGESUM:- Creates a database of document summaries that can be processed using the WordPerfect merge and sort functions. If no summary exists for the document, the first 400 or so characters in the document are used.

PRINTIT:- Paginates and formats an ASCII text file ready for printing.

PRSFONTS:- Lists and optionally names fonts listed in a PRS file. **STYLIST**:- Lists names and descriptions of styles.

WHATPTRS:- Lists the printers

described in ALL files, optionally sorted by printer name.

WPSLOOK:- Display one or more WordPerfect v5.0 or WordPerfect v5.1 document files specified on the command line. Because wild cards can be specified on the command line it is much easier to look at a collection of files. **WPSNOOP**:- Determines, in greater or lesser detail, the file type of files associated with recent WordPerfect Corporation products. For document files, list the document summary. For macro files, lists the description of the macro.

Much more detail than this is given in the text file WPTools3.DOC that is present on the diskette. This contains the full documentation required to use the programs.

MAIL PERFECTLY

Mail Perfectly is an easy to use, menu driven mailing list manager for WordPerfect v5.0 or WordPerfect v5.1. It consists of macros that automate the operations required to create mailing lists for WordPerfect.

The options on the main menu allow you to add, delete and sort entries, and then create the mail-merge list required by WordPerfect. Very simple to use, if a little difficult to get going. All WordPerfect users will need to make sure that the files from the diskette are in your main WordPerfect directory, as it doesn't work any other way. If you need to do mailing lists, Mail Perfectly makes it easy.

WPG IMAGES #1

This is the first diskette in what I hope will be a series of graphics diskettes for WordPerfect users. On this diskette are 70 graphic images in WPG format from a company called Premiere Software. This diskette is a

sample of the professionally drawn artwork available.

In the documentation that comes with this diskette is a list of the 30 diskettes currently available, and they cover the following subjects: Executive, Finance, Cartoons, Animals, Music, Sports, Famous People and more. All diskettes are broken down into subjects, so if you want a heap of computer graphics, you buy the graphics diskette (\$25). Below is a quick list of some of the artwork on this first sample diskette:

ACE.WPG:- Ace of Spades card
CHESSKNT.WPG:- Chess Knight
BBANG.WPG:- Border outline
CONFID.WPG:- CONFIDENTIAL
GARFIELD.WPG:- Garfield pic.
MICKEY1.WPG:- Mickey Mouse
PLANE1.WPG:- Aeroplane pic.
SHUTTLE1.WPG:- Space Shuttle

As you can see, this sample diskette covers a lot of topics, and should keep any WordPerfect user happy for a while. All of the diskettes from Premiere Software can be had for a maximum of US\$25.00 so they rate as good value.

If you require any of the diskettes listed above, or in previous articles, simply send a cheque or money order for \$7.50 per diskette (5-1/4") or \$15.00 per diskette (3-1/2" with 2 programs selected) to:

MacroDisk
Unit 2, 47 Vernon Street
Sth Kingsville, VIC 3015

Well, that about does it for this month. I hope non WordPerfect users don't feel that this month's column has been a waste. I try to cover a variety of programs so that no-one is left out. Next month, we might look at some diskettes for the Sound Blaster cards, some VGA games and working programs. ■

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NEWSAMSTRADNEWS

From the current CPC and PCW scene.

PCW PRINTER SUPPORT

Locomotive Software have just announced the release of a new **Printer Support Pack** for the PCW8125/8512s and the 9512s. As its name suggests, the single pack provides all the software necessary to support printers being used on PCWs. Each pack contains the equivalent of the 8000 Printer Drivers disk, the 9000 Printer Drivers and Character Set, both the 8000 and 9000 24-pin Printer Drivers disks and Printwheel disk.

Before this pack was released, it would have cost over \$300 to purchase everything that is supplied in the new pack. Now, it can all be bought for just \$120.00. Most people will be pleased with this new arrangement, but if you just want a mandatory 24-pin Printer driver to use with your LocoFont 24, you will still have to get the complete pack. If you are one of these people, then you had better move quickly to grab the last few "singles" in the Mail Order section.

Also announced was the release of another combined **Loco Pack**, this time featuring **LocoScript2 with LocoFile** at the price of \$185.00. It's an impressive combination with a saving of \$37 on the individual prices. For more details on the above products contact Strategy Publications on (03) 803 9661.

NEW CPC COMPILATIONS

An influx of new compilations for CPC users has arrived to test joysticks to the limits over the Christmas break (assuming they don't all sell out) and fortunately they are all available in tape or disk format. First off the rank is the star-studded **Hollywood Collection** (disk: \$52.95, tape: \$42.95) from Ocean. It features the metallic avenging angel in **RoboCop**, weird slimy happenings in **Ghostbusters 2**, a shadow in the darkness of **Gotham City with Batman - The Movie** and finally the chase for the Holy Grail with **Indiana Jones and the Last Crusade**.

Next there's **Edition One** (disk \$59.95, tape \$49.95) from Virgin games. This is another four-

pack with heaps of action. Super-smooth graphics and addictive gameplay make the **Silkworm** helicopter action game a superb shoot-em-up, followed by **Xenon** and **Gemini Wing**, two more alien shoot-em-up classics. Wash these down with **Double Dragon** and you've got an action-packed compilation.

The third compilation is **Platinum Capcom** (disk: \$59.95, tape \$49.95), featuring four of the best Capcom conversion hits. **Black Tiger** features a pretty well perfect conversion from the original platform game. **Strider** has fast action and great graphics while **Forgotten Worlds** was voted one of the arcade conversion shoot-em-ups of the year. Pulling it all together is **Ghouls 'n' Ghosts** a mega-challenge to keep you occupied for ages, or put another way "Una brillante conversione, davvero tutta da giocare."



Finally, an explosive compilation from Tengen called **TNT** (disk \$59.95, tape: \$49.95). Again, it's a collection of successful arcade conversions. The list begins with the big hit **Hard Drivin'**, ultimate driving with solid 3D graphics. **APB** (or All Points Bulletin) is a high-speed game of cops and robbers with fiery exchanges and dangerous arrests. Then there's **Toobin** featuring the Tube Dudes riding rapids and challenging white water in addictive action. Another action packed game of 'do or die missions' is presented with **Dragon Spirit**, a game of aerial combat and destruction. Completing the list is the double action, split screen, one or two player robot hunting game in the shape of **Xybots**. All five games are excellent conversions from the originals.

WEAK AUSS RAISES PRICES

Lower interest rates are very welcome to most of us in Australia. On the other side of the coin though, so to speak, they make our dollar less attractive to overseas investors and consequently weaker against other currencies like the US dollar and the British pound. This in turn makes imports more expensive and as most computer software is imported, the prices are bound to rise.

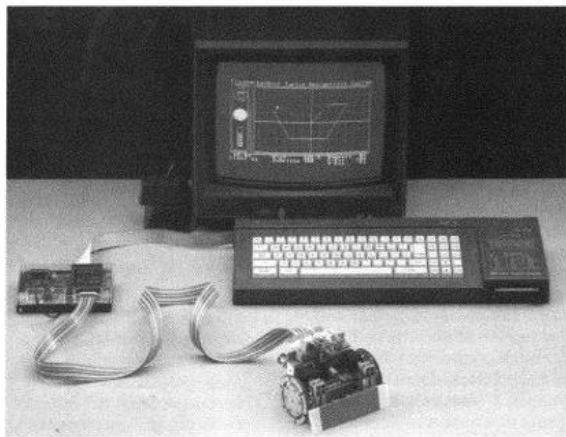
Most importers have been pretty good over the past six months by absorbing a large amount of the increases themselves, but now the bubble seems to have burst with expensive across the whole range of CPC, PCW and PC imports. It's not surprising when you consider that an item being imported from the UK costing, say, \$40 in June of this year now costs \$50 - an increase of 25%!

ROBOTICS ON CPCs

There's an interesting article on Page 12 of this issue giving details

of a new robot kit to link to a PC and make it perform various functions. Imagine our surprise when the review unit arrived with PC interfaces and software but the picture on the box - see picture below - displayed an Amstrad CPC6128 (or Schneider to be more accurate) connected to the gizmo. Obviously the Germans originally designed the kit to run with a CPC and have since expanded the number of computers it can handle.

A quick phone call to the importers (The PC Pty Ltd) revealed that there were no plans to bring in the necessary interface and software for the CPCs unless the demand warranted it. If you are serious about wanting such a kit for your CPC and are prepared to pay the price, please drop us a line and we will lobby on behalf of CPC users. Alternatively you could ring The PC Pty Ltd on (03) 890 6688, fax on (03) 890 0884 or write to 657 Whitehorse Road, Mont Albert, Vic 3167. The more that voice interest, the more likely they will respond positively.



The Turtle robot attached to the Amstrad CPC.

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CPC GAMES

Nineteen ninety has been quite a year for CPC owners. Amstrad U.K. officially launched the CPC Plus (a range of computers that will take a cartridge as well as a disc/tape and will feature great graphics ability), but Amstrad Australia announced that they would not be importing this new 8-bit machine. Software houses, however, are still producing games for the old CPC, though importers in Australia have been a little slow getting the latest CPC software into the shops. But still the games keep coming, and there have been some great releases during 1990, and from the high standard of programming shown in the best releases, it would be a big pity if the industry abandoned the old CPC, just when they have learned how to get the best out of it. Let's now review the games that made it big in 1990.

Four of the biggest hits at the movie box office during 1989 produced four of the best computer games of 1990. Ocean scooped the pool when it won the rights to produce computer games based on Batman - The Movie and The Untouchables. Both games feature action from selected scenes from the movie and feature great graphics and playability. Domark managed to get a slice of the movie tie-in pie with their release of License To Kill, based on the James Bond film of the same name. Again, action is from selected scenes from the movie and scores high in graphics and playability (if anything, it's a bit too easy). Not to be forgotten, Activision won the rights to Ghostbusters II and, with the aid of the Oliver twins (best known for their work at Codemasters) have produced a great game with digitised pictures from the movie between

sections, good graphics and tons of playability.

Conversions of arcade games were prolific during 1990. Of the games produced, Ocean managed to score very high with their conversions of Operation Thunderbolt (the sequel to Operation Wolf) and Rainbow Island, two very playable and polished products. Firebird produced a version of P-47 Thunderbolt which is very good; Microstyle announced it was on the game scene with a good first up effort with Xenophobe; and Domark showed it could convert arcade games with a very good version of Klax. Even with these great conversions swamping the scene, there was still a lot of competition from producers of original concept games. Hewson proved that there were still fairies around with Stormlord, and then topped off the year with the release of Cecco's

Collection, which re-released four of the best games designed by Raffaello Cecco. Rainbow Arts showed that they had really known how to program the CPC with the release of Turricon and X-Out, two games that are quite simply great. System 3 and U.S. Gold had hits with the release of Myth and E-Motion respectively, which both helped to prove that games based on original ideas can still be good. Titus showed that it could still produce games as good as Crazy Cars II, at least graphically, with their release of Knightforce and Wild Streets, and Empire produced a winner with Dr. Doom's Revenge, which features Captain America, Spiderman and all the baddies from the comics that you loved to hate. Loricell launched West Phaser, a great concept of a game that needed a light gun (supplied in the package) but have failed to follow it up with

That the year was

*Vic Renfrew points out
CPC releases for the
the somewhat*

other releases. As you can see, a lot of quality software has been released for the CPC, and that's only in the platform style of game.

There have been a number of motor racing games produced during the year that were very good. Microstyle produced

AMSTRAD

Was CPC that ...

the highs and lows of
1990, with a view to
certain future.

possibly the best first-person perspective racing game very late in the year with the release of the CPC version of Stunt Car Racer, although Domark's version of Hard Drivin' was not very far behind. The big disappointment in this style of racing game was Test Drive II - The

Duel from Accolade, which promised quite a lot but failed to deliver. Activision also launched a racing game, this one a conversion from the arcade game Powerdrift, which is viewed from behind your car. Also utilising this perspective is Ocean's conversion of Chase HQ, another arcade game; this one based on a police chase. Both of these games are good, and are faithful reproductions of the originals.

Sport has always been a popular subject for computer games. With 1990 being the year of the World Cup, it's not surprising that soccer has become the flavour of the year for sports games. There have been three good soccer games produced, these being World Cup Soccer; Italia '90 from Virgin, Italy 1990 from U.S. Gold and Microprose Soccer from Microprose (although this was released in 1989, it did not arrive in Australia until 1990). Italy 1990 is reportedly the best of these, with good graphics and a lot of speed, but the others are also good.

Another one that's a playable game, but with poor graphics, is Kick Off by Anco. Empire produced a compilation called World Cup 90 Compilation, which combined three good games into a package of great value. It's a pity that soccer games don't sell well here, because with the quality of those mentioned above, and some that are planned, the market has a number that should sell well, but, alas they won't. Again Anco produced a game that should have sold very well in Australia; Australian Rules Football. Unfortunately, it tried to convert a soccer style into our beloved code, and didn't quite work. A good try from the poms

though. Other sport games to be released that are worth looking at are Jack Nicklaus' Golf from Accolade (don't try the tape version; loading takes forever), Cyberball by Domark (a futuristic American football game), International 3D Tennis from Palace, and Oriental Games from Firebird (featuring kendo, kung fu and sumo wrestling). All in all, a busy year on the sports front.

There hasn't been much of quality produced for the CPC into the wargame front. War In Middle Earth from Melbourne House and Carrier Command from Rainbird are the only offerings, but both are good and guaranteed to keep you involved for many hours. Role playing style games have also produced a couple of real winners. Bloodwych from Imageworks, Times Of Lore from Origin and Castle Master, Domark's first joint effort with Incentive are also great games, with plenty of atmosphere and hours of enjoyment guaranteed.

Things have been very quiet in the area of adventure games, with only Level 9's last 8-bit game, Scapeghost and The Tolkein Trilogy from Beau-Jolly offering anything for the serious adventurer to come to grips with.

Only Activision released a flight simulator during 1990, with the long awaited release of Fighter Bomber. This is a flight simulator that's easy to fly, engage in missions that are initially fairly easy to come to handle, but very difficult to master. Again, a lot of good games which guarantee hours of enjoyment.

The above games can be viewed as the computer highlights of 1990. However, there have been some big disappointments

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also. The first, in my opinion, was the failure of Australian importers to release Laser Squad, by Target Games in this country. A similar type of wargame to Rebel Star from Firebird (reviewed in TAU Dec. 88), Laser Squad was imported on other formats, but not for the CPC. Another disappointment was the long awaited release of the CD Games Pack by Code Masters, an event that promised much and failed to materialise. Whether or not it was even released outside of the country is unknown, but it didn't make the journey to Australia. Lastly, the decision by Amstrad Australia not to support the CPC Plus or the old CPC would have to be viewed as the biggest disappointment for CPC owners around the country.

1990 was a good year for computer games, and 1991 promises to be just as good. Programs to look out for are Deliverance - Stormlord II from Hewson, which promises to be just as good as the original game; Player Manager and Kick Off II from Anco, which should have improved from Kick Off but retain the playability; Iron Lord from Ubisoft (a role playing adventure); and Snow Strike, a flight simulator battle against the drug lords of South America, to be released by U.S. Gold. Target Games (Bladesoft) will be releasing another wargame, called The Lords Of Chaos (in either late 1990/1, but whether it will be imported here is unknown). A lot of prospective talent, but how much we will ever see is a problem to consider.

The future for the CPC looks very grim. With PC computers being so cheap and popular, Amstrad Australia have abandoned the machine that established the company. This is a great pity because, as can be seen from the quality of the games released during 1990 and as mentioned above, it would appear that software houses, particularly companies from France, now know how to get the best out of the CPC. The future for CPC owners looks good from the software expected to be released next year, but with the machine no longer being sold here, it is doubtful if importers will be all that willing to bring the software into the country, which will be disappointing to those people who actively support the CPC. We'll have to wait to see what the future holds, but if the games produced during 1991 are as good as those of 1990, the future should be very bright. Let's hope the good titles continue to be available. We'll see next year. ■

You can look forward to next month's issue to read a full review on Back To The Future II, Beach Volley, and the new compilation, Platinum Capcom.

Proceed with Part 2

The second installment of Paul Gerard's simple but effective word processing program for the CPC.

Part One of this word processing program featured in the December issue of The Amstrad User. Because of the length of the type-in it has been necessary to extend it over a number of issues, as much for the sake of your aching fingers as for the conservation of space.

The final set of options are on the PRINT and FONT menus. These are selected exactly as with the first menu - to which you will return if the printing is completed or aborted. A feature which you may like to include in your own programs is a function which allows the program to detect if your printer is not on, or is not connected properly, or is "off-line". If you are trying to use this program without even owning a printer (a pointless exercise one would think, but you would be surprised what some people will do) then this feature will of course come into

play. Look at line 3140 and the user-defined function "FNpron".

Another feature that I have always wanted to have in the word processor; that I have used is the font changing ability. Try this, and see if it works with your printer (chances are it won't, but you may be lucky). Test each option on the "Font menu" by printing a little test file using each setting (as well as settings in combination). Make a list of those that work (if any) and those that don't (if any). Now check your manual and see if you have an alternative setting of the dip switches called EPSON or something that you are not using. If so try it out. If you are still not getting good enough results then go through your printer manual - there SHOULD be a section showing the necessary escape codes - these will then need to be substituted for my "Citizen/Epson" ones in the array "str\$".

There are a number of features that a professional wordprocessor would have that are lacking - in particular we have no "find & replace", no "block" delete and move, no facility to emphasise and underline text, no on-screen indication of the foot of a page, nor the ability to set for on-screen indication of the foot of a page, nor the ability to set, for example, A4 or foolscap as well as standard computer paper, not to mention file merging, mail merging, spell checking and so on. We would add all these features, and others - the snag would be that we would use all of the "standard" 64K of RAM of the CPC for program and have none for text. The answer is to use the extra RAM of the CPC6128 and the "expanded" CPC464 to store text, leaving all the available "front" RAM for program - in fact, purely as an exercise, you may want to have a go at just that - the question is, is it worth the bother when there are already several excellent word processing programs available?

For those readers who do want to tinker with this program, I must apologise for the compressed style of the code - the program was written in the "well remmed", nicely set out manner recommended by me in my structured programming series. Unfortunately this left so little room for text that I had to compress it a great deal. Once you understand what particular sections do, however, you will find that the underlying good structure of the program should make modifications fairly easy.

The type-in continues on the following page, the final installment of which will appear in February's issue of The PC Mag.

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```

940 IF FNcurs(ASC(b$)) THEN GOSUB 1680
950 IF FNdel(ASC(b$)) AND (mx>1) THEN GOSUB 1390
960 IF FNsp(ASC(b$)) THEN GOSUB 1440
970 IF FNtabkey(ASC(b$)) THEN GOSUB 1360
980 IF FNcontrol(ASC(b$)) THEN GOSUB 2130
990 WEND
1000 IF FNprich(ASC(b$)) AND mx<rn+1 THEN IF FNins(my)
=FALSE THEN MID$(t$,mx,1)=b$:MID$(t$(pt(my)),mx,1)=b$
:PRINT b$;mx=mx+1:last.char=last.char+1 ELSE GOSUB 110
0
1010 IF mx=rn+1 AND FNprich(ASC(b$)) THEN GOSUB 1230
1020 IF (INSTR(b$,CHR$(13))=1) AND (FNins(my)=TRUE) A
ND ((f<fr-1)) THEN swop=pt(f+1) ELSE 1050
1030 FOR i=f+1 TO my+1 STEP-1:pt(i)=pt(i-1):NEXT
1040 pt(my)=swop:f=MIN(f-1,f+1):GOSUB 2110:IF sy=23
THEN LOCATE 1,23:PRINT LEFT$(t$(pt(my)),79); ELSE RETUR
N
1050 IF (sy=23) AND (INSTR(b$,CHR$(13))=1) AND (my<(fr-
1)) THEN PRINT LEFT$(t$(pt(my+1)),79);LOCATE MAX(1,mx)
,22
1060 WEND
1070 IF mx=1 AND mx<rn THEN PRINT MID$(t$(pt(my)),mx
,1);
1080 IF auf AND FNprich(ASC(b$)) THEN GOSUB 1480:LOCATE
1,sy:PRINT LEFT$(t$(pt(my)),79)
1090 RETURN
1100 PRINT b$;mx=mx+1
1110 MID$(t$(pt(fr)),1)=SPACE$(B4):MID$(t$,1)=t$(pt(my)
):MID$(t$(pt(my)),mx-1,1)=b$:MID$(t$(pt(my)),mx)=MID$(
t$,mx-1)
1120 LOCATE 1,sy:PRINT LEFT$(t$(pt(my)),79)
1130 k1=mx:ks=sy:kc=my
1140 IF INSTR(MID$(t$(pt(my)),rn,2)," ")=1 THEN 1220
1150 IF INSTR(MID$(t$(pt(MIN((my+1),fr))),rn-1,5),"
")=1 THEN 1190
1160 swop=pt(MIN(f+1,fr))
1170 FOR i=MIN(f+1,fr) TO kc+2 STEP -1:pt(i)=pt(i-1):NE
XT
1180 pt(MIN(kc+1,fr))=swop:f=MIN(f+1,fr):GOSUB 2110
1190 GOSUB 1230
1200 IF sf<k1 THEN my=MIN((my+1),fr):sy=ks+1:k1=1+m+(k1-
sf-1) ELSE sy=ks:my=kc
1210 mx=k1
1220 RETURN
1230 IF my=(fr-1) THEN RETURN
1240 IF FNfu11(my) THEN my=my+1:sy=sy+1:mx=1:m:RETURN
1250 sf=B4:WHILE MID$(t$(pt(my)),sf,1)="" AND sf)1:m:sf
=sf-1:WEND
1260 line.end=sf:WHILE (MID$(t$(pt(my)),sf,1)<>" " AND
sf)1:m-1) OR (sf>rn):sf=sf-1:WEND
1270 IF NOT FNins(my) THEN MID$(t$(pt(my+1)),1)=MID$(t
$(pt(my)),sf+1):GOTO 1300
1280 MID$(t$(pt(my+1)),1+line.end-sf+1)=MID$(t$(pt(my+

```

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```

1)) ,1)m
1290 MID$(t$(pt(my+1)),1)=MID$(t$(pt(my)),sf+1,1:line.e
nd-sf+1)
1300 MID$(t$(pt(my)),sf)=SPACE$(B4-sf)
1310 IF sy<23 THEN LOCATE 1,MIN(sy+1,23):PRINT LEFT$(t
$(pt(my+1)),79):GOTO 1340
1320 IF FNins(my)=FALSE THEN PRINT LEFT$(t$(pt(my
+1)),79):GOTO 1340 ELSE IF (mx<sf-1) AND (sy=23) THEN 1
350
1330 PRINT LEFT$(t$(pt(my+1)),79);
1340 sy=MIN(sy,22):LOCATE sf,sy:PRINT SPACE$(79-sf)
1350 RETURN
1360 i=1:WHILE tap(i)<=mx AND i<=tabs:i=i+1:WEND
1370 IF (tap(i))1 AND tap(i)<rn THEN PRINT MID$(t$(pt
(my)),mx,1);mx=tap(i) ELSE PRINT MID$(t$(pt(my)),mx,2)
;mx=1:m:MID$(b$,1)=CHR$(13)
1380 RETURN
1390 MID$(t$(pt(my)),mx-1,1)=" " :MID$(t$,1)=t$(pt(my))
1400 IF FNins(my) THEN MID$(t$(pt(my)),mx-1)=MID$(t$,m
x):LOCATE 1,sy:PRINT LEFT$(t$(pt(my)),79):GOTO 1420
1410 PRINT CHR$(B);" " :MID$(t$(pt(my)),mx,1);CHR$(B);CH
R$(B)
1420 mx=mx-1
1430 RETURN
1440 MID$(t$(pt(my)),mx,1)=" " :MID$(t$,1)=t$(pt(my))
1450 PRINT CHR$(16);
1460 IF FNins(my) THEN MID$(t$(pt(my)),mx)=MID$(t$,mx+
1):LOCATE 1,sy:PRINT LEFT$(t$(pt(my)),79)
1470 RETURN
1480 GOSUB 1630
1490 gc=B:gn(B)=1mk
1500 WHILE gn(gc)>0:gc=gc+1:gn(gc)=INSTR(gn(gc)-1,LEF
T$(t$(pt(my)),rnk)," "):spfg(gc)=FALSE:WEND
1510 gc=gc-1:IF gc=0 THEN RETURN
1520 gpad=0
1530 WHILE rnk<rn
1540 MID$(t$,1)=t$(pt(my))
1550 gp.sp=INT(RND*gc+1):IF spfg(gp.sp) THEN 1550 ELS
E spfg(gp.sp)=TRUE
1560 MID$(t$(pt(my)),gn(gp.sp))=" "
1570 MID$(t$(pt(my)),gn(gp.sp)+1)=MID$(t$,gn(gp.sp))
1580 rnk=rnk+1:gpad=gpad+1:FOR i=gp.sp TO gc:gn(i)=g
n(i)+1:NEXT
1590 IF gpad=gc THEN gpad=0:FOR i=1 TO gc:spfg(i)=FALS
E:NEXT
1600 WEND
1610 MID$(t$,1)=t$(pt(my))
1620 RETURN
1630 1mk=1:WHILE MID$(t$(pt(my)),1mk,1)="" AND 1mk(rn
+1mk-1):WEND
1640 rnk=rnk:WHILE MID$(t$(pt(my)),rnk,1)="" AND rnk)1
k:rnk=rnk-1:WEND
1650 gp=INSTR(MID$(t$(pt(my)),1mk,rnk-1mk)," ")

```

```

1660 IF go THEN MID$(t$(pt(my)),1,1)+go)=MID$(t$(pt(my))
,1,1)+go-1:GOTO 1650
1670 RETURN
1680 PRINT MID$(t$(pt(my)),mx,1);
1690 MID$(t$(pt(my)),1)=t$(pt(my))
1700 ON ASC(b$)-239 GOTO 1720,1770,1820,1830,1840,1870
,1910,1970,2020,2040,2060,2070
1710 WHILE INKEY$<"":WEND
1720 IF my>1 THEN my=my-1 ELSE RETURN
1730 MID$(t$(pt(my)),1)=t$(pt(my))
1740 sy=sy-1
1750 IF sy=0 THEN sy=1:LOCATE 1,1:FOR i=my TO my+22:PR
INT LEFT$(t$(pt(i)),79):NEXT
1760 RETURN
1770 IF my>(fr-1)-1 THEN RETURN
1780 my=my+1:MID$(t$(pt(my)),1)=t$(pt(my))
1790 sy=sy+1
1800 IF sy=24 THEN sy=23:PRINT LEFT$(t$(pt(my)),79):LO
CATE 1,23
1810 RETURN
1820 IF mx>1 THEN mx=mx-1:RETURN ELSE GOSUB 1720:mx=r
a:RETURN
1830 IF mx<ra THEN mx=mx+1:RETURN ELSE GOSUB 1770:mx=
1a:RETURN
1840 IF sy=1 THEN my=MAX(my-23,1):GOSUB 2110 ELSE my=MA
X(my+1,1)
1850 MID$(t$(pt(my)),1)=t$(pt(my)):sy=1:mx=1a
1860 RETURN
1870 old.line=my:IF sy=23 THEN my=(MIN(f,my+23)):sy=(ol
d.line\23)+23:GOSUB 2120 ELSE my=MIN(my+(23-sy),f)
1880 MID$(t$(pt(my)),1)=t$(pt(my)):mx=1a
1890 IF my<f THEN sy=23 ELSE sy=sy+(my-old.line)
1900 RETURN
1910 IF mx<1a THEN GOSUB 1720:IF sy=1 THEN mx=1a ELSE
mx=ra:RETURN
1920 mx=mx-1
1930 WHILE ASC(MID$(t$(pt(my)),mx))>32 AND mx>1a:mx=
mx-1:WEND
1940 WHILE ASC(MID$(t$(pt(my)),mx))<33 AND mx>1a:mx=
mx-1:WEND
1950 IF mx<1a THEN GOSUB 1720:GOSUB 2070:IF (mx<ra AND
mx>1a) THEN mx=mx-1
1960 RETURN
1970 IF mx>ra THEN GOSUB 1770:mx=1a:RETURN
1980 mx=mx+1
1990 WHILE ASC(MID$(t$(pt(my)),mx))>32 AND (mx<ra+1:mx=
mx+1:WEND
2000 WHILE ASC(MID$(t$(pt(my)),mx))<33 AND (mx<ra+1:mx=
mx+1:WEND
2010 IF mx>ra THEN GOSUB 1770:mx=1a:RETURN ELSE RETURN
2020 CLS:sy=1:FOR i=1 TO MIN(23,f):PRINT LEFT$(t$(pt(i)
),79):NEXT
2030 sy=1:sy=1:mx=1a:RETURN

```

```

2040 GOSUB 2090
2050 my=f:mx=ra:RETURN
2060 mx=1a:RETURN
2070 mx=84:GOSUB 1910:IF mx<ra THEN mx=mx+1
2080 RETURN
2090 CLS:sy=MIN(f,23):FOR i=MAX(1,f-22) TO f:PRINT LEFT
$(t$(pt(i)),79):NEXT
2100 RETURN
2110 y=0:FOR i=sy TO MIN(23,f+1):LOCATE 1,i:PRINT LEFT$
(t$(pt(my+y)),79):y=y+1:NEXT:RETURN
2120 top=(my-23):FOR i=1 TO 23:LOCATE 1,i:PRINT LEFT$(t
$(pt(top+i)),79):NEXT:RETURN
2130 con=ASC(b$)
2140 ON con GOSUB 2160,2150,2150,2250,2150,2670,2150,21
50,2190,2150,2150,2150,2280,2150,2190,2150,2150,2280,21
50,2280,2150,2190,2150,2150,2150
2150 RETURN
2160 IF auf THEN auf=FALSE:MID$(fora$,1)="OFF" ELSE auf
=TRUE:MID$(fora$,1)="ON"
2170 LOCATE#1,74,1:PRINT#1,fora$
2180 RETURN
2190 IF INSTR(b$,CHR$(22))=1 THEN IF ins THEN ins=FALSE
ELSE ins=TRUE
2200 IF INSTR(b$,CHR$(9))=1 THEN ins=TRUE
2210 IF INSTR(b$,CHR$(15))=1 THEN ins=FALSE
2220 IF ins=TRUE THEN MID$(ins$,1)="Insert " ELSE MID$
(ins$,1)="Overtyp"
2230 PRINT#5,ins$
2240 RETURN
2250 MID$(t$(pt(my)),1)=SPACE$(65)
2260 IF NOT FNins(my) THEN LOCATE 1,sy:PRINT LEFT$(t$(p
t(my)),79):RETURN
2270 swop=pt(my):FOR i=my TO MIN(fr-1,f+1):pt(i)=pt(i+
1):NEXT:pt(MIN(fr,f+2))=swop:GOSUB 2110:RETURN
2280 PRINT MID$(t$(pt(my)),mx,1)
2290 IF INSTR(b$,CHR$(13)) OR INSTR(b$,CHR$(10))=1 THEN
k=1 ELSE k=3
2300 IF k<3 THEN WINDOW#2,1,80,1,1
2310 CLS#2:CLS#1
2320 WHILE k<4
2330 CLS#1:PRINT#6,"Reset "rul.op$(k);? (Y/N) ";:G
OSUB 640
2340 IF yes THEN CLS#1:PRINT#1,rul.inst$(k):DN k GOSU
B 2400,2410,2500
2350 k=k+1
2360 WEND
2370 GOSUB 3600:GOSUB 3740
2380 IF mx<1a THEN mx=1a ELSE IF mx>ra THEN mx=ra
2390 RETURN
2400 LOCATE#2,1a,1:mgn=1:mgn.set=1:GOSUB 2420:1a=mgn.s
et:RETURN
2410 LOCATE#2,ra,1:mgn=2:mgn.set=ra:GOSUB 2420:ra=mgn.s
et:RETURN

```

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Guide to Machine Code - 2

The second part of Alex Aird's introduction to Machine Code programming continues this month with advice on screen-moving programs.

The answer to last month's homework, on a program to do the equivalent of INK 1,26 in machine code, should look something like this:

IN ASSEMBLER

```

LD A,1          LD A,1
LD B,26         or LD BC,&1A1A
LD C,26         CALL &BC32
CALL &BC32      RET
RET

```

USING REGILOAD

```

10 :LDA,1          10 :LDA,1
20 :LDB,26         or 20 :LDBC,&1A1A
30 :LDC,26         30 :FWCALL,&BC32
40 :FWCALL,&BC32

```

If you do not have an assembler, then you could simply poke the required bytes into memory. Where to poke it? Well, anywhere really - so long as it doesn't overwrite anything

else. &8000 is as good a place as any:

```

10 FOR address=&8000 TO &8008
20 READ byte
30 POKE address,byte
40 NEXT
50 DATA &3e,&01 'ld a,1
60 DATA &01,&1a,&1a 'ld bc,&1a1a
70 DATA &cd,&32,&bc 'call &bc32
70 DATA &c9 'ret

```

This Basic program pokes a short machine code program into memory at address &8000. All that's needed is to CALL &8000 to execute the program. But how do we get from the mnemonics to the numbers in the data statements?

&3E means load register 'A' with the following number, so

&3E,&01 = LD R,1.

&01 means load the register

pair BC with the following two bytes, so

&01, &1A,&1A = LD BC,&1A1A.

&CD means call the following address, so

&CD,&32,&BC = CALL &BC32.

&C9 means return - in this case to Basic, so

&C9 = RET

Notice that &BC32 translates in the data statement to &32,&BC. This is because addresses are stored backwards for easier retrieval later. To see what I mean, write on a piece of paper BC 32. Now slide that piece of paper under something (your keyboard maybe). If you slide BC under first, when you pull it out again it will come out 32BC. Alternatively, slide 32

under first. Then, when you pull the paper out again, it will come out BC 32, which is the correct order.

The computer stores addresses like this, pushing E32 into a pigeon hole first, followed by EBC, so that when it pops them out again they will come out in the correct order EBC32.

One thing machine code is very good at is moving large chunks of memory around, such as a screen, or if you have a 6128 or expanded 464, then several screens. Basic simply isn't up to the task - it's too slow.

Now type in and run the following program:

```
10 PAPER 0:MODE 1
18 '
19 'set screen memory to &4000
20 :LDA,&40
30 :FVCALL,&BC08
39 '
40 PAPER 3:CLS
50 PRINT "This is a demo"
60 PRINT "of moving a screen"
70 PRINT "using BASIC."
80 PRINT "Slow isn't it!"
88 '
89 'set screen memory to &C000
90 :LDA,&C0
100 :FVCALL,&BC08
108 '
109 'move a screen from &4000
110 'to &C000 using Basic.
120 de=&C000
130 hl=&4000
140 bc=&4000
150 POKE de,PEEK(hl)
160 hl=hl+1
170 de=de+1
180 bc=bc+1
190 IF bc<>0 THEN 150
200 PAPER 0:END
```

I've seen screens loaded from tape as fast as this. The differ-

ence with machine code, though, is astounding:

```
10 PAPER 0:MODE 1
18 '
19 'set screen memory to &4000
20 :LDA,&40:FVCALL,&BC08
29 '
30 PAPER 3:CLS
40 PRINT "This is a demo"
50 PRINT "of moving a screen"
60 PRINT "using machine code."
70 PRINT "press a key,"
80 PRINT "but don't blink!"
90 CALL &B806 'wait for keypress
108 '
109 'set screen memory to &C000
100 :LDA,&C0:FVCALL,&BC08
108 '
109 'move a screen from &4000
110 'to &C000 using M/Code.
120 :LDHL,&4000
130 :LDDE,&C000
140 :LDDB,&4000
150 :FVCALL,&B91B
160 PAPER 0:END
```

The firmware call EBC08 sets the screen memory base to E4000 (low) or EC000 (high). The screen normally occupies the addresses EC000 to EFFFF. To change it to occupy the addresses E4000 to E7FFF, simply load register A with the high byte of the screen base - i.e. E40 - then CALL EBC08. To tell the screen to occupy addresses EC000 to EFFFF again load A with EC0, then call EBC08.

The firmware call EBB06 merely waits for a keypress before continuing. Moving the screen itself

is done using the firmware routine EB91B, or to give it its name, KL LDIR. If you use an assembler you could use the ordinary instruction LDIR. These two instructions are mostly the same. LDIR is an abbreviation for (L)oad (D) Increment and (R)epet.

In assembler, the equivalent of lines 120 to 150 of the Basic program could be written as displayed in Figure 1 in the box below.

The contents of the memory location pointed to by HL are loaded into the memory location pointed to by register pair DE. Register pairs HL and DE are both incremented by one, BC is decremented by one, and if BC is not equal to zero then the process is repeated. In this case it is repeated E4000 times. Study from line 120 to line 190 of the Basic screen-moving program to see an example of the logic of the instruction LDIR.

LDIR has a complementary instruction LDDR, or Load Decrement and Repeat. For something to think about until next time, try rewriting the Basic screen-moving program so that the screen is still moved from E4000 to EC000, but this time do it backwards. That is from bottom-right to top-left of the screen. If you can do that then it is safe to assume that you are on the right track. ■

Figure 1.

```
LD HL,&4000 ;load the register pair HL with &4000.
LD DE,&C000 ;load the register pair DE with &C000.
LD BC,&4000 ;load the register pair BC with &4000.
LDIR ;Load Increment and Repeat.
```

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Let's Date

A calendar program for the CPC.

Not everybody gets a calendar for Christmas, so this type-in falls appropriately at the beginning of the year. The result of the program is the ability to print a full calendar of any given year, or alternatively print a singular month of any year. Months may be printed in one of two sizes; ie, large or small. Well, get cracking, there's not a minute to lose!

```
1800 'CALENDER by J.Valentine
1810 'TAU Jan 91.
1820 MODE 1:INK 0,0:BORDER 0:INK 1,26
1830 IF PEEK(41000)=0 THEN POKE 41000,1:MEMORY 40999
1840 IF PEEK(41000)=0 THEN s=0 ELSE IF PEEK(41000)=1 THEN s=0
1850 DIM k(12),n(12),m(12,7,6):FOR j=1 TO 12:READ k(j):
NEXT:FOR j=1 TO 12:READ n(j):NEXT
1860 DATA 30,31,29,30,30,31,31,32,33,33,34,34
1870 DATA 31,28,31,30,31,30,31,31,30,31,30,31
1880 INK 2,13:INK 3,15
1890 a$="CALENDAR MAKER":c=1:p=14:GOSUB 2300
1100 RESTORE 1130:c=9:p=12:PAPER 0
1110 READ a$:IF a$="END" THEN 1140
1120 GOSUB 2300:c=c+4:GOTO 1110
1130 DATA "1 .. Year Calendar","2 .. Month Calendar","3
.. Printing"
1140 DATA "4 .. Exit Program","END"
1150 a$=INKEY$:IF a$="" THEN 1150 ELSE a=ASC(a$)-48
1160 IF a<0 OR a>4 THEN 1130
1170 ON a GOSUB 1190,1570,2080,2130
1180 RUN
1190 MODE 1:a$="YEAR CALENDAR":c=1:p=14:GOSUB 2300:l$=""
1200 LOCATE 4,10:PEN 1:PRINT "Please input the year you
require:"
```

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```
1210 LOCATE 10,20:PRINT "----"
1220 a$=INKEY$:IF a$="" THEN 1220 ELSE a=ASC(a$)-48
1230 IF a<0 OR a>9 AND a<>79 THEN 1220
1240 IF a=79 AND LEN(l$)>0 THEN LOCATE 17+LEN(l$),20:l$=
MID$(l$,1,LEN(l$)-1):PRINT "-";GOTO 1220 ELSE IF a=79
THEN 1220
1250 l$=l$+a$
1260 LOCATE 10,20:PRINT l$:IF LEN(l$)>4 THEN 1220
1270 yr=VAL(l$):WINDOW #2,1,40,5,20:CLS #2:c=1:IF (yr/1
00=INT(yr/100) OR INT((yr-1900)/4)=(yr-1900)/4) THEN l$
ap=1 ELSE leap=0
1280 MODE 1:a$="YEAR 1":s=p=16:GOSUB 2300
1290 c=10:p=10:a$=""DO YOU WANT A PRINTOUT?:GOSUB 2300
1300 c=15:p=11:a$=""Please Press Y or N?:GOSUB 2300
1310 a$=INKEY$:IF a$="" THEN 1310 ELSE a$=UPPER$(a$)
1320 IF a$<>"Y" THEN RETURN
1330 MODE 2
1340 IF s=0 THEN c=10:p=23:a$="PLEASE ENSURE THE PRINTE
R IS ON LINE":GOSUB 2300
1350 IF s=0 THEN PRINT #0,CHR$(27)+"x"+CHR$(1)
1360 PRINT #s,SPACE$(34):"YEAR: ";l$
1370 PRINT#s:PRINT#s
1380 ---- WORK OUT CALENDAR ----
1390 FOR mth=1 TO 12:yy=1:dy=1:d=0:GOSUB 2150:xx=2-1
1400 IF mth=2 AND leap=1 THEN n(2)=29 ELSE n(2)=26
1410 d=d+1:xx=xx+1:IF xx=8 THEN xx=1:yy=yy+1
1420 IF (mth=2 AND d=30 AND leap<>1)OR d=n(mth)+1 THEN
NEXT:GOTO 1440
1430 m(mth,xx,yy)=d:GOTO 1410
1440 FOR yy=0 TO 5
1450 IF yy=0 THEN PRINT #s,TAB(13);"JANUARY";TAB(60);"F
EBRUARY" ELSE IF yy=1 THEN PRINT #s,TAB(14);"MARCH";TAB
(63);"APRIL" ELSE IF yy=2 THEN PRINT #s,TAB(15);"MAY";T
AB(63);"JUNE" ELSE IF yy=3 THEN PRINT#s,TAB(15);"JULY";T
AB(62);"AUGUST"
1460 IF yy=4 THEN PRINT#s,TAB(12);"SEPTEMBER";TAB(61);"O
CTOBER" ELSE IF yy=5 THEN PRINT#s,TAB(12);"NOVEMBER";TAB
(60);"DECEMBER"
1470 PRINT#s:PRINT#s," SUN MON TUE WED THU FRI SAT
SUN MON TUE WED THU FRI SAT
1480 FOR r=1 TO 6:PRINT #s," ";
1490 FOR xx=1 TO 2:mth=yy+2+xx
1500 FOR c=1 TO 7
1510 IF m(mth,c,r)=0 THEN PRINT #s," "; ELSE PRINT #
s,USING "##";m(mth,c,r);
1520 NEXT
1530 IF xx=1 THEN PRINT#s,SPACE$(20); ELSE PRINT#s
1540 NEXT:NEXT:NEXT
1550 FOR a=1 TO 5:PRINT#s:NEXT:c=22:p=34:a$=""Press any
key,":GOSUB 2300
1560 a$=INKEY$:IF a$="" THEN 1560 ELSE RETURN
1570 MODE 1:a$="MONTH CALENDAR":c=1:p=14:GOSUB 2300:l$=""
1580 LOCATE 4,10:PEN 1:PRINT "Please input the year you
```

```

require:
1590 LOCATE 18,20:PRINT "----"
1600 as=INKEY$:IF as="" THEN 1600 ELSE a=ASC(as)-48
1610 IF a<0 OR a>9 AND a<>79 THEN 1600
1620 IF a=79 AND LEN(1$)>0 THEN LOCATE 17+LEN(1$),20:1$
+MID$(1$,1,LEN(1$)-1):PRINT "-";GOTO 1600 ELSE IF a=7
9 THEN 1600
1630 1$=1$+a$
1640 LOCATE 18,20:PRINT 1$:IF LEN(1$)<4 THEN 1600
1650 yr=VAL(1$):WINDOW #2,1,40,5,20:CLS #2:c=1:IF (yr-1
980)/4=INT((yr-1980)/4) OR yr/100=INT(yr/100) THEN leap
=1 ELSE leap=0
1660 as="":WINDOW #2,1,40,5,25:CLS#2:c=18:GOSUB 2300:c=
22:GOSUB 2300
1670 WINDOW #2,1,40,11,23:PAPER #2,2:CLS #2:PAPER #2,0
1680 PAPER 2:WINDOW 5,35,11,23:PEN 1
1690 LOCATE 13,1:PRINT"MONTHS":PRINT:PRINT"January 01
July 07"
1700 PRINT:PRINT"February 02 August 08"
1710 PRINT:PRINT"March 03 September 09"
1720 PRINT:PRINT"April 04 October 10"
1730 PRINT:PRINT"May 05 November 11"
1740 PRINT:PRINT"June 06 December 12"
1750 PAPER 0
1760 WINDOW 1,40,1,25:LOCATE 5,5:PRINT "Please input th
e month you require"
1770 LOCATE 20,7:PRINT "--"
1780 1$=""
1790 as=INKEY$:IF as="" THEN 1790 ELSE a=ASC(as)-48
1800 IF a<0 OR a>9 AND a<>79 THEN 1790
1810 IF a=79 AND LEN(1$)>0 THEN LOCATE 19+LEN(1$),7:1$=
MID$(1$,1,LEN(1$)-1):PRINT "-";GOTO 1790 ELSE IF a=79
THEN 1790
1820 1$=1$+a$
1830 LOCATE 20,7:PRINT 1$:IF LEN(1$)<2 THEN 1790
1840 mth=VAL(1$):IF mth=0 OR mth>12 THEN 1790
1850 MODE 1:c=10:p=10:a$="DO YOU WANT A PRINTOUT":GOSUB
2300:c=15:p=11:a$="Please Press Y or N":GOSUB 2300
1860 as=INKEY$:IF as="" THEN 1860 ELSE as=UPPER$(a$)
1870 IF as<>"Y" THEN RETURN
1880 CLS:WINDOW 5,40,5,25
1890 dy=1:GOSUB 2150:xx=z-1:YY=1
1900 IF mth=2 AND leap=1 THEN n(2)=29 ELSE n(2)=28
1910 d=d+1:xx=xx+1:IF xx=8 THEN xx=1:yy=yy+1
1920 IF d=m(mth)+1 THEN 1940
1930 m(mth,xx,yy)=d:GOTO 1910
1940 IF s=8 THEN CLS:p=1:c=5:a$="Do you want it printin
g in small letters":GOSUB 2300:c=12:p=11:a$="Please Pre
ss Y or N":GOSUB 2300
1950 IF s=8 THEN as=INKEY$:IF as="" THEN 1950 ELSE as=U
PPER$(a$):IF as="Y" THEN PRINT #8,chr$(27)+"*"+CHR$(0);
CHR$(15);CHR$(27);"5";CHR$(0);CHR$(27);"3";CHR$(19):PRI
NT#8
1960 IF s=8 THEN IF as="N" THEN PRINT #8,CHR$(27);"x";:C

```

```

HR$(1);CHR$(27);"1";CHR$(27);"3";CHR$(32):PRINT#8 ELSE
IF s=8 AND as<>"Y" THEN 1950
1970 IF mth=1 THEN PRINT #8,TAB(10);"JANUARY"; ELSE IF
mth=2 THEN PRINT #8,TAB(10);"FEBRUARY"; ELSE IF mth=3 T
HEN PRINT#8,TAB(10);"MARCH"; ELSE IF mth=4 THEN PRINT#8
,TAB(10);"APRIL";ELSE IF mth=5 THEN PRINT #8,TAB(12);"M
AY";
1980 IF mth=7 THEN PRINT#8,TAB(11);"JULY"; ELSE IF mth=
8 THEN PRINT#8,TAB(10);"AUGUST"; ELSE IF mth=9 THEN PRI
NT#8,TAB(9);"SEPTEMBER"; ELSE IF mth=10 THEN PRINT#8,TA
B(10);"OCTOBER"; ELSE IF mth=11 THEN PRINT#8,TAB(10);"N
OVEMBER";
1990 IF mth=6 THEN PRINT #8,TAB(11);"JUNE"; ELSE IF mth
=12 THEN PRINT #8,TAB(10);"DECEMBER";
2000 PRINT #8,yr
2010 PRINT#8:PRINT#8," SUN MON TUE WED THU FRI SAT"
2020 FOR R=1 TO 6:PRINT #8," ";FOR C=1 TO 7:IF m(mth,
c,r)=0 THEN PRINT #8," "; ELSE PRINT #8,USING " ## "
;m(mth,c,r);
2030 NEXT:PRINT#8
2040 NEXT
2050 c=22:p=14:a$="Press any key.":GOSUB 2300
2060 as=INKEY$:IF as="" THEN 2060
2070 RUN
2080 MODE 1:c=10:p=6:a$="PRINT TO THE SCREEN OR PRINTER
":GOSUB 2300
2090 c=15:p=11:a$="Please Press S or P":GOSUB 2300
2100 as=INKEY$:IF as="" THEN 2100 ELSE as=UPPER$(a$)
2110 IF as="S" THEN S=0:POKE 41000,1 ELSE IF as="P" THE
N S=8:POKE 41000,0 ELSE 2100
2120 RETURN
2130 CALL 0
2140 GOTO 2140
2150 ' -----
2160 ' FIND DAY OF WEEK
2170 ' -----
2180 yr=yr-1980
2190 x=yr*365+INT(yr/4):IF yr/4=INT(yr/4) AND mth<3 THE
N x=x-1
2200 x=x+k(mth)+30*(mth-2)+dy
2210 z=x-7*INT(x/7)+1
2220 z1=z
2230 day$="SunMonTueWedThuFriSat"
2240 yr=yr+1980
2250 day$=MID$(day$,3+z-2,3)
2260 RETURN
2270 ' -----
2280 ' FRAMED MESSAGE
2290 ' -----
2300 WINDOW #1,1,80,c,c+2:PAPER #1,2:CLS #1
2310 y=414-c*16:PLOT 0,y,3:DRAW# 640,0:PLOT 0,y-48,0
2320 DRAW# 640,0:PLOT 0,y-46,3:DRAW# 640,0
2330 LOCATE #1,p,2:PRINT #1,a$
2340 PAPER #1,0:RETURN

```

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Numbering Pages

A look at how the PCW word processor makes numbering document pages easy and automatic.

Whether it's a book, a report, or simply a letter to a friend, numbering pages is both useful and improves the way your document looks.

With LocoScript there's no need to put the page numbers in by hand. Instead, you can get LocoScript to number the pages for you - and in a range of styles. All you have to do is mark the spot and LocoScript will insert the correct page number when the document is printed.

Where you have a large document, we recommend that you split it up into a number of smaller documents so that editing the text is easier. In such cases, you'll want the page numbers to follow on from one another as if you were printing a single document. LocoScript 2 provides you with a feature that lets you do this automatically. In this article, we show you both how to give your documents

different Page number codes and three different characters to mark the place where the page number is printed.

The two Page number codes are (PageNo) and (LPageNo). These correspond to the two different page numbers that you might want to insert in your document, the number of the current page (ie. the number of the page the code is on) and the number of the last page in the document. The number of the last page is needed, for example, when you want to use the Page n of m style of page numbering.

The three different characters correspond to the three different ways in which you might want to position the page number in the space you reserve for it - to the left of the space, to the right of the space or centred. The characters that are used are <, > and =. They were chosen because they each suggest the type of positioning they are used to indicate. For example, < can be thought of as pointing to the left and therefore is the character to be used when you want the numbers to be over to the left of the reserved space; similarly > points to the right and it's used to reserve the space when you want the numbers to be over to the right.

When you want them centred, you use =. Of course, you need to use the same character for each space you want to reserve, as a mixture of characters doesn't make any sense and won't work!

The characters are always positioned immediately after the Page number code they refer to. There cannot be even a space between the code and the characters. Indeed, if all you have got so far out of your attempts to put in page numbers

page numbers and how to number several documents consecutively.

Putting a page number into a document involves putting a special Page number code and some particular characters at the point in your document that you want the page number to appear. The Page number code tells LocoScript that you want it to insert the page number; the characters reserve the space in the document that will be used for that page number.

Each character reserves space for one digit of the page number, so you always need at least as many characters as there are digits in the largest page number you have. So if, for example, you have page numbers going up to 100, that's a maximum of three digits and so you need at least three characters to reserve enough space.

CODES AND CHARACTERS
LocoScript actually has two

has been == or << where you wanted a page number, you have probably been putting a space between the code and the characters.

PUTTING IN THE CODES

The special Page number codes are 'word processing' codes just like the familiar styling codes such as (+Bold) and (+Italic), or the positioning codes (CEnter) and (RAlign). The only difference with these is that you can't insert them from a menu like Style or Layout, you are only able to insert them from the Set menu.

The two Page number codes are (PageNo) and (LPageNo). As you know, the quick way of entering a code is by pressing + (the key you have to press to bring the Set menu onto the screen anyway), followed by the letters of the code that are in capitals. So the quick way of entering a (PageNo) code is to type +PN, while the quick way to enter a (LPageNo) code is to type +LPN.

To show you exactly how the Page number codes and characters are used, let's suppose that you wanted LocoScript to print the current page number like this:

Page 1, Page 22 etc.

i.e. starting with the word Page and followed by a space and then a number that could have up to two digits.

Before starting, a useful tip is to make sure that both codes and spaces are visible on the screen, by using the f8 Options menu. This is important because without these showing, you might inadvertently insert spaces in the wrong place. Or you might accidentally delete a special code you've inserted by

over-zealous use of the 'DEL' keys.

The word Page and the space that follows it are simply text and so are typed in the normal way. Immediately after the space, you need the Page number code. The page number here is the current page number and so the code you want is (PageNo). To put in the code, you type +PN. This gives you:

Page^(PageNo)

For the number itself, you need to reserve two spaces (so that it can handle two-digit numbers like 22) and you want the number positioned to the left. This means that you need to follow the (PageNo) code by two of the <'left' markers, giving you:

Page^(PageNo)<<

And that's all you need. Remember, though, to check that you don't have a space between the code and the characters.

DIFFERENT STYLES

Page 1 is not the only style of page numbering you can have. With LocoScript you're free to adopt the style which suits you, using any combination of text, the current page number and the last page number. For example, you might want the page number to be printed like this:

-1-

Or you might want to include the total pages as well:

Page 1 of 4

The -n- style of page number is simply the current page

number centred between two hyphens. Given that you would like to handle both one and two-digit numbers, what you need in your document is just -(PageNo) ==-.

The Page n of m style is the Page n style we described above, with 'of' followed by the last page number tacked onto the end. So all you require in the document is:

Page^(PageNo)<< of (LPageNo)<<

PLACING PAGE NUMBERS

You can set up page numbers anywhere you like in your document, but the best place to put them is in your Header or Footer text - that is, the special text that you can put at the top or the bottom of each page.

There are several reasons for putting the page number code in Header or Footer text. For a start, it means that you only have to set up the page number codes once to print the correct page number on each page. When LocoScript adds your Header or Footer text to a page, it knows the number of the page it is adding this text to, and so it will insert the correct page number for you. The other advantage of putting page numbers in Header or Footer text is that the page number will appear in the right place on each page regardless of how much you change your document. Headers always appear at the top of the page; Footers always appear at the bottom.

The Header and Footer text is set up on the Pagination Screen in Document Set-up, and you can control the pages on which the Headers and Footers (and hence your page numbers) are printed through the Header/Footer Options menu. It's even

possible to print the page number in different positions on odd and even numbered pages to give you the effect of right and left hand pages, as we show you overleaf.

NUMBERING A WHOLE BOOK

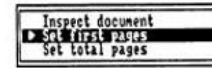
The best way of handling any long piece of text is to split it into a number of separate documents. Authors, for example, might keep the chapters of a book in separate documents. However, in such cases you have two requirements. You want the page numbers in the different documents to match and you want the page numbers to run on from one document to another. After all, there aren't many books where every chapter starts at page 1!

These requirements are readily met by LocoScript 2. The problem of matching the style of page numbers across a number of documents is solved by setting up a template with the style of page numbering you require in its Header and Footer text, and then creating all the documents from this template.

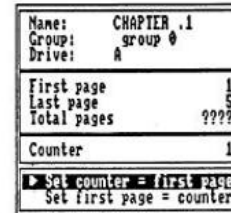
To help you get the page numbers to run on, LocoScript 2 has a special Set first pages option in the f5 Document menu on the Disc Manager screen. Another option in this menu enables you to set the same Total Pages number in every document. The key to this operation is a counter which LocoScript automatically sets to one more than the final page number in each document you pick out. We show you how this works below.

The first step in setting up consecutive page numbers is to return to the Disc Manager Screen and pick out the first document in the series with the File cursor. When the cursor is

in place select Set first pages from the f5 Document menu:



and in turn the following menu appears:



This menu tells you the current page numbers in this document and the current setting of the counter, giving you the choice of setting the counter to match the first page or to change the first page to match the counter.

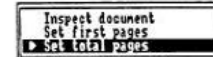
Normally, for the very first document, the option you want is Set counter=first page because at this stage the counter is set to the last value it had - which won't necessarily be 1. The first page of the document, however, probably will be 1. The counter retains its old value so that you can number documents on different discs (you'll have to leave the f5 Document menu when you change the discs in the drives) and so that you don't have to start all over again if you accidentally pick out the wrong document at any point in the sequence.

LocoScript then prompts you for the next document in the series. Pick out this document with the File cursor, press ENTER and the menu will appear again with the counter now set to one more than the

last page in the first document and just the one option Set first page=counter. Simply press ENTER and follow the on-screen instructions until you've set up the first pages of all the documents in the series.

If you're using the style of page numbering Page n of m, you'll want each document to have the same last page number. You can set this up by giving each document in the series the same Total Pages number. Do this immediately after you've set up the last first page number so that the counter has the right value. This time you can pick out the documents either first to last as before or in the reverse order.

Again, you start with the File cursor over the first document you want to set, but this time you select the Set total pages from the f5 Document menu.



LocoScript automatically calculates the total pages number and displays a menu very much as before but with one option Set total pages=counter. You simply have to work your way through the documents so that each document has the same total pages number.

This procedure is intended to be carried out just before you print the final version of each document. There's no point in setting up page numbers until you've edited all your documents. Further editing can upset the page numbering scheme and means you'll have to go through the steps again before printing the document.

Next month's magazine will give you some hints on numbering left and right hand pages.

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THE CPC & PCW CATALOGUE

Regular readers will know that the following pages contain the most comprehensive list of software for the Amstrad CPC and PCW computers.

Please remember though, it's prepared many weeks before you get to see it and changes (deletions, additions, prices) could have occurred in the meantime. It is wise, therefore, to provide an alternative choice or ring beforehand to confirm availability.

To help you make a choice, the products can be found in the categories and pages as follows:

CPC Arcade Action	60	PCW Games	63
CPC Budget Titles	60	PCW Business	63
CPC Business	61	PCW Educational	63
CPC Compilations	61	PCW Graphics	63
CPC Educational	61	PCW Locomotive Products	63
CPC Graphics	62	PCW Training	63
CPC Sporting Action	62	PCW Utilities	63
CPC Strategy/Adventure	62	PCW Public Domain	63
CPC Utilities	63	PCW Accessories	64
CPC War/Military/Sims	62	PCW Peripherals	64
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2. The following postage charges must be added to your remittance:

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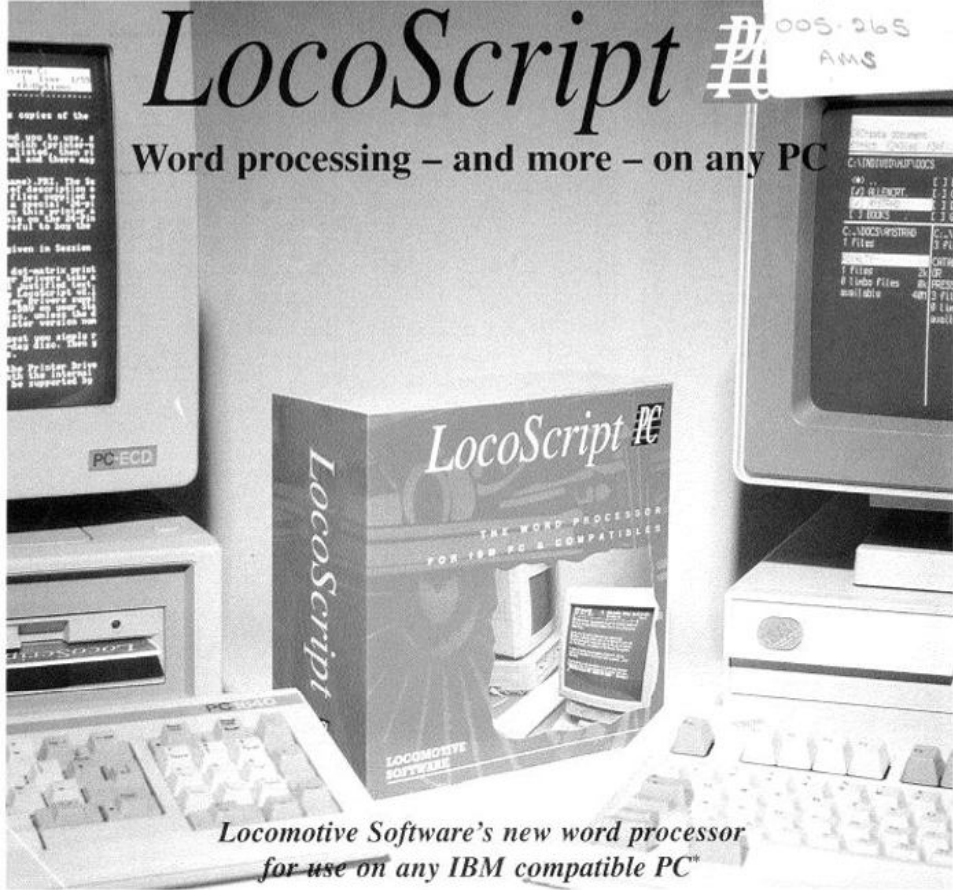
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