

The Aussie Mag
for Amstrad owners

THE AMSTRAD USER

Issue No. 57

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October 1989



- Two page CPC Hacker's type-in + Z80 programming + hottest games reviews + Fantastic Adventure part 2
- Using paper with LocoScript + more CP/M+ to learn + Programming in Forth + deeper into Fill Algorithms
- BASIC programming techniques + PC Public Domain

FOR THE NOVICE & EXPERIENCED USER

"Skweek"

and ye shall find!!!

- "The hottest game for '89!"

Hallelujah!!

In the beginning there was Chess, and it was good, but not that good. And Chess flourished, became popular and *begat* Checkers, which *begat* logical thought, which *begat* electronics, which *begat* computers.

Then there was the computer game, and it was better; but not by much. The computer game attracted many to evil ways of "Fun", but it soon lost its appeal, and the many strayed.

Then LORICIELS *begat* "SKWEEK", and it was fantastic! The many returned and increased manifold. There was great enjoyment in the land, and many even forgot about *begatting* anything else.

The beginning, the end and the middle was "SKWEEK", the constant **FUN** and the eternal frustration. **AMEN!**

MAX: 1:12:4

And lo! "SKWEEK" could *begot* at Maxwells Office Equipment (VIC), Grace Bros, Myer, Harvey Norman, Computer Spot, Steve's (ACT), Westend, and ye multitude of other retailers.



Every now and then, there appears a game that has the lot; Graphics, Music, Sound FX, Action, Strategy, Puzzles and above all else, that indefinable "something" that makes you come back time after time.

"SKWEEK" is that game for 1989.

It's **FAST**, **FUN**, **FRANTIC** action right from the start. Simple to follow gameplay makes it instantly enjoyable and incredibly addictive. **ENJOY!**

"SKWEEK" is available on AMIGA and PC (512k minimum, Graphics Card required) also on Atari ST & Amstrad CPC.

N.S.W. : Pactronics Pty Ltd, 33-35 Alleyne Street, Chatswood. (02) 407 0261

VICTORIA : Pactronics Pty Ltd, 51-55 Johnston Street, Fitzroy. (03) 419 4644

QUEENSLAND : Pactronics Pty Ltd, 12 Stratton St, Newstead, 4006. (07) 854 1982

SOUTH AUSTRALIA: Baringa Pty Ltd, (08) 271 1066 ext. 6132

WESTERN AUSTRALIA: Pactronics, unit 13, 133 High Rd Willleton 6155. (09) 354 1122

NEW ZEALAND: Micro Dealer NZ Ltd, PO Box 23-678, Papatoetoe, Auckland. (09) 274 9300

 **Pactronics**

THE AMSTRAD USER

Issue No. 57 - October 1989

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All enquiries and contacts concerning this Publication should be made in the first instance by writing to The Amstrad User, 641 High Street Road, Mount Waverley, Victoria 3149, Australia. Urgent matters can be phoned through on (03) 233 9661.

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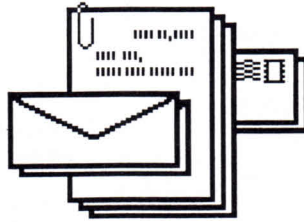
From time to time, some articles appearing in The Amstrad User will be reproductions from UK publications Amstrad Action, 8000 Plus and CPC Computing (formerly Computing with the Amstrad). The first two are printed under an agreement between Strategy Publications and Future Publishing Ltd, Bath, and the latter under an agreement with Database Publications.

The subscription rate (for Australia) is \$42.50 for 12 issues of the magazine only, or \$80.00 for 12 issues of the magazine plus tape (for CPC range only) containing programs appearing in that issue. Postage is included in the above prices. For subscriptions to New Zealand, PNG, Solomon Islands or Vanuatu please add \$21 airmail. Other overseas prices available upon application.

Please note that whilst every effort is made to ensure the accuracy of all features and listings herein, we cannot accept any liability whatsoever for any mistakes or misprints. Contributions are welcome from readers or other interested parties. In most circumstances the following payments will apply to published material: Cartoons \$10.00 and a rate of \$15.00 per page for programs, articles etc. unless otherwise previously agreed. Contributions will not be returned unless specifically requested coupled with a suitable stamped and return addressed padded bag (for tapes or discs).

The Amstrad User is an independent Australian magazine, in no way affiliated with Amstrad or their Australian distributors or any dealer in either software or hardware (TAU Shop excepted).

LETTERS TO THE EDITOR



A monthly selection of your comments, hints and tips, advice and news - all shared for the benefit of Australasian Amstrad users.



I have a few problems, questions and ideas and I am hoping that you can help me with them.

I have purchased "Game Set and Match 2" and I am having trouble with the track builder for "Championship Sprint". I build my 8 tracks and set the drone speed, spanners and hazards, then I select the save option. The screen turns blue and the message insert disc appears. I do this then push space or return and the message "push REC and PLAY on cassette deck" appears. Please help (I do not have a tape deck).

Here's an idea for all those people who write pokes. All pokes in every computer mag I read are to make games easier, why not some to make games harder, because when you complete a game it loses a lot of appeal, but if it got harder it would give it back a bit of appeal.

On Arkanoid, Ocean have cut the playing area into the border, I thought this was impossible and why don't more publishing companies do it?

Can anyone tell me how to get past "Skull Hallway" in Dragon's lair?

Thank you for a great magazine which I have bought since getting my computer (a 6128) three years ago. Your mail order section has much increased and I think your magazine beats the competition hands down.

Jason Schneider, Hamilton, Vic.



I note your enquiry in latest TAU re fitting a 5.25" disc drive to your PCW8256 and I relate to you my experience in doing just that.

About twelve months ago I obtained a double sided 80 track 5.25" disc drive from Spellbound Publications, 3 Pamela Street Mount Waverley Vic 3149.

The drive has no maker's name on it at all but I understand from Peter Banks of the supplier, that it is a TEAK. It came complete with flat ribbon cable and plug connector and power supply lead.

To connect the unit, all that was necessary was to remove the back from the monitor, fish out the lead and plug from where the B: drive would normally fit, fetch it out through the printer plug hole, replace the back.

The plug attached to the drive had two small plastic protrusions which had to be removed before it could be plugged into the computer socket. At first I lined up the red stripe on the drive cable with the blue stripe on the computer cable but this did not work but succeeded in corrupting my systems disc so that it was no longer usable. On advice from the supplier I reversed the cable so the stripes did not line up and that is the way it works in my case. So be sure you are using a copy of your systems disc when first testing it.

The PCW does not recognise the B: drive unless a disc is in place on power-up, but beware if the B: drive is powered up before the PCW then the directory of the disc in B: will be corrupted. For a long time I used an old disc in B: for powering up, then changing over to my required disc afterwards. Now after months of experience I leave the PCW power switch on at all times. I have both PCW and B: drive plugged into a double adaptor and I switch the whole thing on and off together with no ill effect to discs which may be in either drive.

I am perfectly happy with my unit except that it is a little noisy, however it's a small price to pay for the cheapness of the discs, and it seems to work OK on any old disc.

Other than for LocoScript I leave my systems disc in A: drive at all times. I have all my programs copied to B: discs and use PROFILE.SUB on A: to select B: and SUBMIT.B.SUB which contains the name of any COM file which I need from B:. If you are not familiar with PROFILE.SUB and SUBMIT.COM I could explain it all in another letter. In fact all that I do is put the required 5.25" disc in the drive and switch on and it auto boots up CP/M and BASIC or other COM file, even SUPERCALC loads a particular spreadsheet ready to start entering info into cells without having touched one single key.

Whilst I had the back of my PCW I also upgraded my RAM 512K. I simply had to insert 8 (I think) RAM chips into the already existent sockets and change over 2 dip switches to their alternative position. The instructions were provided by Spellbound Publications.

All in all I am pleased with my unit. Cost wise \$340 for the drive unit and, I think about \$140 for the memory upgrade.

Ron Genge, Forbes, NSW

We cannot be certain that Spellbound are still operating as they have been suspiciously quiet lately, especially when it comes to paying for their advertising. We are reliably informed

that 5.25" disc drives suitable for the PCW (acting as a B drive) are available from Magnetic Data Storage (02) 798 3833 at 5 Grosvenor Crescent, Summer Hill, NSW 2130. You get an 80 track 5.25" floppy drive (720k format or 800k using XFORMAT) in a case with power supply and cable. You also get an MFU program to transfer ASCII files between an IBM and the PCW. The current price is \$290.50.



I noted with interest the comments made some months ago in TAU that the flight simulation program "Chuck Yeager's Advanced Flight Trainer" represented the best of its type available in the CPC range.

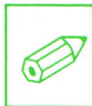
As I have found most CPC flight simulation games lacking in respect of the quality of the graphics I would greatly appreciate a review of the game before I part with the \$55 required to pay for it.

It is also noted that "F-16 Combat

Pilot" by Digital Integration should be available for the CPCs according to an English Magazine. Could you please verify this, and if so when it is likely to be in stock?

Richard Monaghan, Balingup, WA

In next month's issue we will be presenting a review of Chuck Yeager's Advanced Flight Trainer, so save your money until then. As far as F-16 Combat Pilot is concerned, it is only available for the PC. It does not appear on any of the UK software distribution lists, so that means it is either a long way off or won't be produced at all.



Tasword 6128 users BEHOLD! You've heard of poking games, why not poke programs such as Tasword? Well I have done just that. For the benefit of all the users I will supply you with all the pokes and how to operate them. All pokes must be preceded by 'A=ASC("*)' where the asterisk must be changed

by an "A" or a "B" to select the desired drive or the "A" or the "B" can be substituted for a number "0" to "9", enable 10 user areas from any drive.

To operate the pokes run Tasword 6128 in the normal way, and exit to Basic by pressing 'B' then Return at the main menu. Then type 'A=ASC("*)' (remember the asterisk has to be substituted for a number or a letter) and poke: -

TASCODE2.BIN &1A70,A
TASCODE3.BIN &1A7E,A

For Tas-Spell users a bonus: same as all of the above although I have not tried it for the reason that I have not yet bought this program.

TASPELL.BIN &1A62,A

If you intend to save Tasword 6128 on Drive B, using the 'Save Tasword' option from the main menu you must copy TASCODE3.BIN onto a backup disc on drive B using pip from CP/M+. Now edit

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Carlton, 3053
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Fax: (03) 347 2378

line 150 and line 170 and take the 'a:' prefixes from ALL the TASWORD filenames. Now poke:-

TASCODE3.BIN SAVING FILENAME
#6B53,A

(where the asterisk is substituted for a "B"). Now type run (ensuring you have poked all the pokes you need). And save Tasword by pressing 'T' then Return at the main menu. When it asks for the current workdisc insert the backup disc into Drive B. Then insert the disc you wish to save Tasword to and continue on from there. You should now have a working copy of Tasword on drive A or B or mixed with a user area.

Finally to conclude my letter, I ask you or anyone who can help me to answer these 4 questions :

1. What happens to the date utility on side 1 of CP/M+ when in 11 years time it is the year "2000"? I ask because the time cannot be set to the year "2000" or onwards.

2. Is there any possibility that Drive A can be on one user while Drive B is on a different user simultaneously?

3. Is there any possibility of booting CP/M+ or CP/M 2.2 from a 5.25" Single Sided 40 track Drive B on a 6128? It can do all the normal AMSDOS function, it can be accessed under CP/M, but it cannot boot CP/M.

4. Is there an address I can peek or poke to see whether a printer (DMP2000) is ON or OFF LINE?

Anyhow keep up the good work, your magazine is an excellent reference, even to me a person 14 years of age. If your shop below looks as good as it sounds than I shall be coming there VERY QUICKLY! I hope you print this letter in your magazine.

Brian Mifsud, Lator, VIC



I am a student and have an IBM compatible and an Amstrad CPC464 with colour monitor with TV tuner, and would like to be able to connect my Amstrad monitor with my IBM via TV tuner or the monitor

itself, because colour monitors today cost a fortune, so please someone help me and others in my situation.

Petar Karnovic, Stanmore, NSW



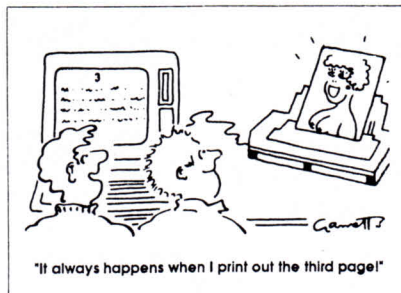
As a female computing teacher and subscriber to The Amstrad User, I am concerned at finding an

increasing number of cartoons, reviews and advertisements in TAU of an offensive nature. I believe that it is the magazine editor's duty to maintain a high moral standard in their work. I have included photocopies of some of the material which concerns me.

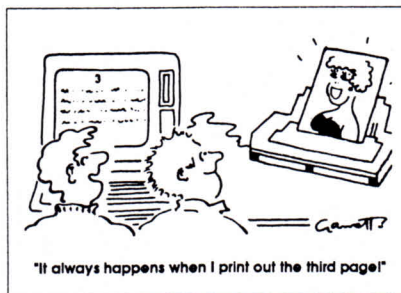
Please note that I have modified the illustration so that students could borrow the magazine without being exposed to vulgar cartoons. I suggest that you look at your original copy if you cannot remember the uncensored version.

Emmanuelle sounds like something to be found in a dingy adult pornographic book shop. Surely it is not worthy for inclusion in The Amstrad User.

The games reporter reviewing "Human Killing Machine" seems unimpressed with the software. The name alone is enough to put me off. Why bother to review such a



Before...



After...

distasteful game? We could well do without it.

I hope I will not encounter such material in TAU in future or I will have to seriously consider cancelling my subscription.

F.J. Alford, Nuriootpa, SA

So that everyone understands what Ms. Alford is writing about, we have reproduced the cartoon below, in its original form and after amendments. We don't find the original offensive and doubt that many others do either.

The advertisement for Emmanuelle came from Pacronics and illustrates the theme of the game. Accordingly we have labelled it 'AO' in our Mail Order listing. We may add that some 'X' rated software (not from Pacronics of course) has attempted to find its way into this magazine on a few occasions in the past, but we have a policy of refusing or editing out these items.

Your last point raises the argument that if we fail to review games which are concluded to have a distasteful theme, are we doing our readers a disservice? We believe that it is our duty to report on games as we see them in order to allow readers to make their own choice, as indeed you have done.

PEN PALS

Bending again to popular demand, here's a new section for pen pals! You can join this list by writing to "Pen Pals" care of The Amstrad User.

Kenny Thomas (CPC)
35 Doreen Street
Christchurch 7 N.Z.

Richard Jacquemin (CPC464)
177 Railway Avenue
Kelmescott WA 6111

Chris Maloney (CPC464 & PC)
20 Helena Court
Rye Vic 3941

Stephen Phillipson (CPC)
16 Julia Drive
Bunbury WA 6230

Corey Powell (CPC464)
24 Campbell Street
Shepparton Vic 3630

Paul Tacey (CPCs)
RMB 5134
Shepparton Vic 3631

If you use *Mini Office* or *LocoFile*, here's what you've been missing:

"FLIPPER is an invaluable tool, and really is like having an extra PCW."

Rob Ainsley, *New Computer Express*

"I am completely sold on it"

Paul Hendy, *Your Amstrad PCW*

"FLIPPER is one of the most impressive utilities I've seen for the PCW"

John Minson, *Computer Shopper*

FLIPPER could do some pretty surprising things. It could split you PCW in two, letting you run LocoScript 2 in one half and a CP/M program in the other. Or it could let you load two CP/M programs at once if you preferred, one in each half. It could flip you from one half to the

other in under three seconds, any time you wanted. And it wouldn't lose your place.

Unfortunately, there were a few things it couldn't do. In particular, it couldn't load either *Mini Office Professional* or *LocoFile*. Serious shortcomings indeed.

Now **FLIPPER 2** is here. It can do everything FLIPPER could, but it works with *Mini Office* and *LocoFile* too (it can even manage both at once if you want). What's more, we've added more options and made it easier to install. Oh, and you can FLIP in as little as 2 seconds now!

FLIPPER 2:
at \$89.95, it's essential.

Bankcard, Mastercard or Visa orders are welcome, written or telephoned, quoting the card expiry date. Send you orders to:

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Mount Waverley
Victoria 3149

Tel: (03) 233 9661

NEWS BREAK

Our monthly update on the gossip, news, releases and the general Amstrad scene from both home and abroad

UK RELEASES FOR CPC

Since the acquisition of the Firebird label from Telecomsoft by Microprose comes the release of some new titles for the CPC. First is **Oriental Games** containing Hollywood Rules, Kung-Fu, Sumo Wrestling and Kendo - four beat-em-ups each having their own mini tournament. A computer or human opponent can be fought and when all four styles have been mastered a chance to compete in a grand tournament is presented.

A Sega coin-op conversion called **Action Fighter** is a vertically scrolling shoot-em-up split into four types of landscape. The action starts on a motorbike avoiding enemy traffic and overhead helicopters, but weapons are available to fight back. More aggressive machinery can be obtained by accumulating 'floating letter'.

A new vertically-scrolling climber game titled **Rick Dangerous** is due for release soon. It's a cartoon-like strategy game with a good injection of humour. Egyptian tombs and Aztec temples are just two of the four levels which must be negoti-

ated by Rick.

On the movie themes, **Batman - The Movie** has been released and is due in Australia some time this month. Although we don't know much about the game yet, we can say that the theme is similar to the film which means that it may well show the more sombre side of the caped hero. **Indiana Jones and the Last Crusade**, also from US Gold, was due to be released about the same time as the film. Apparently the game's writers were given a copy of the film script and were sworn to secrecy to avoid any leaks. Now that the film has been released, we can only assume that Indy's computer quest will be for the Holy Grail fighting off Nazis as he goes.

Imageworks has the contract to convert Sega's coin-op game **Passing Shot**. It features all the shots you would normally expect to use in a real game: lob, spin, slice, smash and so on. There are even ball boys and line judges. Games take place either on clay or grass courts in a Grand Slam tour of singles and doubles.

EDITOR BREATHES SIGH OF RELIEF

We were about to use this little space to say that the Editor was desperate for some help on two PC Sierra games and that if he didn't get some hints quickly he was going

to generate some serious static electricity on his pile carpet and zap his PC2086 motherboard to Nirvana. Luckily two very timely hint sheets were forthcoming, thus avoiding some totally uncalled for violence.

FEEDING A PCW

Amstrad (UK) have at last announced the impending release of the ASF9512. No more mystique behind the model numbering system: it stand for Automatic Sheet Feeder for the PCW9512.

"Over the years we have been inundated with requests to provide specially designed peripherals for our word processors. After extensive research into the needs of users we are now announcing our automatic cut sheet feeder which we believe will provide a useful and cost effective addition to the PCW 9512 range" was the comment from Amstrad (UK).

The device will automatically feed single sheets of A4 paper through to the 9512 daisy wheel thus allowing for letterheads. It will be supplied with two discs; a new version of LocoScript (2.29) and an amended CP/M Plus, both designed to take account of the new device. In particular the CP/M disc will also allow other CP/M programs to use the feeder.

DRIVING A PCW

If you haven't read the Mailbag section you would have missed the answer about second drives for the PCW. If you write to Magnetic Data Storage, 5 Grosvenor Crescent, Summer Hill, 2130 or ring (02) 798 3833 you can get hold of a second drive for around \$290.00. The unit is called a Floppymax III and is provided with MFU, a program for transferring ASCII files between an IBM and a PCW 8256 or 8512. It has the capacity to hold 720k of data (or 800k if XFORMAT is used) and is used as a B drive.

This is as good a time as any to send a call out for all Hint Sheets, Cheat Modes, Hacks or whatever else you think may be of use to other readers. We consider everything for possible publication.

MORE FROM PACTRONICS

Pactronics' list of products grows unabated. Star of the current releases is **Skweek** (CPC and PC) with lots of graphics, music, sound effects, strategy, planning, action and, above all else, fun. There are 99 PacMan-like levels to provide hours of frustrating fun. Will Skweek replace Pacman? Quite possibly!

For the ultimate in 3-D animation and real-time play on the PC, **Trump Castle**, dubbed the ultimate Casino gambling simulator pack provides a choice of Blackjack, Roulette, Craps, Keno, Video Poker or 9 different slot machines - all following the rules of the New Jersey Casino Control Commission.

Following the recent expedition to find, explore and film the Titanic comes a game based on the exploits. **Search for the Titanic** (PC) is an authentic simulation in which the player starts as an inexperienced

oceanographer and must build up knowledge and reputation for the big search.

Birds 'n' Bees (PC) is a serious package written by psychologists to allow children, under full supervision by a parent or guardian, to comprehensively learn about their human sexuality at their own pace. Passwords, known only to the parent, prevent the child from advancing too quickly. The program includes sections on human repro-

duction, communicable diseases and how to deal with strangers.

A two-fold program (PC) designed to both manage and enhance your video cassette collection is due for release shortly. Called **Video Wizard**, it keeps track of your video usage, what spaces you have, where information is stored and so on. In addition, Video Wizard has an inbuilt character generator to create professional title screens to display on screen or to record on tape.

PROPHECY FOR PCs

Activision has released an amazingly addictive game entitled **Prophecy**, the graphics of which must be seen to be believed. It is really meant to be run on a VGA or EGA screen, although CGA owners do get to choose from a small range of colours. Prophecy features a four-way

scrolling continuous map with various items dotted about the play area. There are sub-levels to the map, and problems which occur require anything from straight hand to hand fighting, a puzzle to solve or spell-zapping. In the latter regard these can be assigned to function keys. By all accounts it is an exceptional game.



Announcing Year Disc 12 Has ARRIVED

Available now from The Amstrad User for a ridiculous \$25, this disc includes every CPC type-in included in issues 53 to 56. But that's not all. As well as this 83K of type-in you get for no extra cost over 50K of FREE Public Domain software! The theme is Games, including Hangman, an adventure, Horoscope and more brain teasers to keep you enthralled until the next year disc arrives! Ring (03) 233 9661 for Year Disc 12 TODAY!

GAMES ARCADE

The Joystick Wizard has a load of new games to work through this month, so with no further ado...

THE
GAMES REVIEWED
THIS MONTH:
Where in the world is
CARMEN SANDIEGO?
TIME SCANNER
WANDERER 3D
XYBOTS

WHERE IN THE
WORLD IS

CARMEN SANDIEGO?

An educational best seller that makes learning fun

PC 5.25" or 3.5" - \$74.95

WITWICS (for short) is a piece of software which will be instantly recognised by many schoolchildren but less so by their parents. I will admit to falling into the latter category for when I was at school computers were as rare as hen's teeth. While I had heard of WITWICS, I wasn't sure what all the fuss was about. Imagine my embarrassment when I first revealed the review copy only to be mauled by my children who eagerly sought to offer advice on how to load it, which keys to press, which plane to take etc. They had all used it at school at one time or another, be it on a PC, an Apple or a Micro Bee.

The 'fuss' is about a piece of software, produced in America by Brøderbund, which has had the accolade "Outstanding Software Award - Classroom Computer Learning" bestowed upon it by the Software Publishers Association. There are two other and subsequent packages in the series - Where in the USA... and Where in Europe... - but I will restrict this review to Where in the World....

The theme is simple: a priceless international treasure has been stolen and your job is to track down the thief, a member of Carmen Sandiego's gang, arrest the felon and recover the stolen item. Being a member of the Acme Detective Agency you have access to

Interpol's Crime Computer which holds a bank of information on each member of the gang. However, the villain's identity is not immediately obvious.

The first step is to log-on to the Crime Computer. This occupies the left half of the screen and is exchanged with location graphics as the chase around the world proceeds. In the top left is displayed the day and time (starting at Monday, 9.00 am) and the current location name. On the right of the screen is an area reserved for responses to actions or clues and a description of the country the player is currently visiting. Underneath this is a small menu of actions: See connections; Depart by plane; Investigate; and Visit Interpol.

Back to the plot: a 'flash' is issued through the Crime Computer advising that a National treasure from Singapore (a prize orchid) has been stolen. A male suspect was reported at the scene of the crime and must be tracked and arrested by Sunday 5.00 pm. As a Rookie you get the initial clue about the sex of the suspect, but in later chases no free clues are given at the start. Of course, the game won't always start at Singapore - it seems to be quite random - but will always start in the country where the crime was committed accompanied with a short paragraph describing the country.

The next step is to 'Visit Interpol' and log into the Crime Computer the fact that the suspect is male. This prompts a list of a possible five suspects (there are ten altogether, the other five are female). The Crime Computer needs any three of five clues to identify a suspect. They are sex, hobby, hair, feature and auto. Travelling around the world talking to witnesses reveals enough answers to complete the identification, always assuming that you don't run out of time. Identification



is most important for without it, an arrest warrant cannot be issued and the search will fail.

While in Singapore, you need to talk to witnesses by selecting 'Investigate' and visiting one or all of the three buildings on display. Visiting the Hotel provides "a suspicious person was here and had always wanted to see Mt. Titano" clue. At the Market Place "a reliable source told he had changed his money into lira. He had a nice convertible" is the clue. From these two witnesses come three pieces of information: he has a convertible (to be entered into the 'auto' section of the Crime Computer): he was going to a country using lira as currency: and (possibly) the country has a place called Mt. Titano. Selecting 'Choose connections' gives a list of the cities that can be visited, but only one will fit the clues given.

At this point you may be wondering how a child is possibly going to know all the major cities, cultures, flags, currencies and landmarks of dozens



of countries across the world. The answer is that they are not expected to, but with the aid of a large paperback copy of 'The World Almanac and Book of Facts'

supplied with WITWICS, researching will provide the answer. The book contains all the information (and much more) necessary to decide on the next move. In our example San Marino was chosen from the other two: Tokyo and Peking.

An indication that you are getting close is given by a graphic henchman bobbing up or running across the screen. At the last location, daggers may be thrown across the screen or a small gun appear as the suspect tries to scare you off.

Investigating and flying makes the clock at the top of the screen fly through the hours, and even sleeping time is taken into consideration. So the track through Mexico, Sydney and finally to Reykjavik made it a close call before the villain was cornered. When selecting a destination, a world map is displayed showing your current position and your choice of landing. The flight path is also mapped. Solving the crime within the time scale is rewarded with promotion to Sleuth. At this next level three crimes have to be solved before moving up to Private Eye. Each level gets a little harder, but at least you don't get killed if you fail. You retain the points gained and try again until you have solved the required number to get the next promotion.

The clever part about WITWICS is that while the children are having fun trying to solve the mystery and catch the villain, they are also learning. That's the whole point about educational software and this particular package most certainly succeeds.

WANDERER 3D

Elite suffering from double vision

PC 5.25" or 3.5" - \$64.50

According to one review I read, 3D games have been around for ages. Strange, as this is the first one I've even seen. It was in this light I sat down to review WANDERER 3D, and I expected a lot from it. Did I find what I was looking for or was I left still looking? To find out, read on....

The story goes that the galaxy is terrorised by VADD, an intelligent android who uses his army of WAR DRONES to rule the galaxy. There are ten planets in the galaxy and each of these are offering a reward for the destruction of Vadd. You are the Wanderer and it is to you that the mission to destroy Vadd falls.

There are two ways to get the power to destroy Vadd; you can either build a Mega-Disrupter that will confuse the War Drones and allow you to confront Vadd, or you can gain the confidence of the planets in the galaxy so that they will supply you with their last remaining one. Well, that's the plot; how is all this put into practice.

The playing area consists of a map showing the ten planets of the galaxy, the three black holes and the planet of Vadd. The remaining area of the map is open space. To commence you can choose to start on any

planet. After this your moves are limited by your ability rating. To start, this is set at one. You are also allowed two disrupter units (each planet has five - if you successfully negotiate the black holes, the number of units that you can have is increased, one for each black hole).

Prior to the shooting starting, there is a short interlude of space travel before landing on the planet. Once landed, you must destroy the five War Drones on the planet. When this has occurred, you can either replenish your shields or energy (if you have the money to do so that is) or you can try to swap your disrupter units with the planet. In this sequence, the game becomes like a game of poker, and the aim is to get pairs of units. However, as you want to gain the confidence of the planets, you should aim to GIVE the pairs to the planets, and in return they will pay you in MEGS, the currency of the galaxy.

Initially, you will have to land in open space and by clearing the sector that you end in, you build up your ability rating and your score. This is also important because you need certain ability levels to enter each of

the black holes. When you clear a black hole you are given a VARIABLE DISRUPTER UNIT, which is worth 2000 megs and is worth having (you can gain a lot of confidence from a planet for 2000 megs), as you will need one to be able to get the Mega-Disrupter.

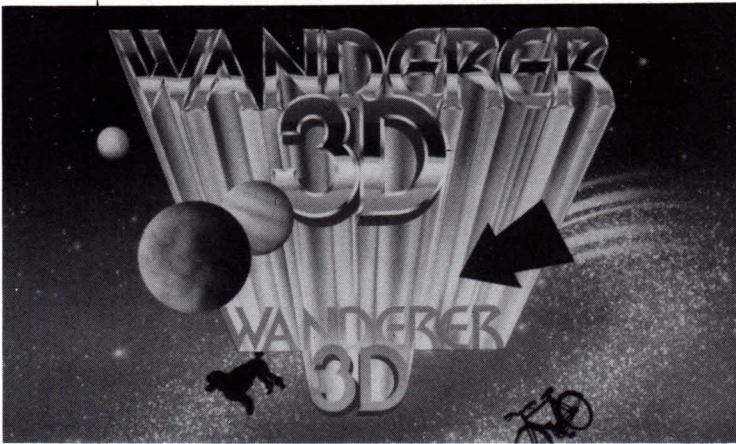
As I said, there are two ways to gain access to Vadd's planet; either through possession of a Mega-Disrupter or by earning the confidence of the planets. As confidence grows, you build up your bank balance. Once you gain sufficient ability or cash (8000 megs) it's off to Vadd's planet where you have to destroy more opposition and, once that's done the game is finished and you are given the option to start again. All pretty standard stuff so far.

What makes this game slightly different is the process of negotiating the black holes and LIMBO. The black holes consist of a number of hexagons floating in space and you must guide your craft through them. Touching

a hexagon, or missing one results in the loss of a shield and the loss of all your shields sends you to Limbo, a series of floating squares where the same process is carried out. Survive Limbo and you restart with 1 shield and a loss of ability. Fail in Limbo and it's game over...

Wanderer 3D is a 3D game. However, in my opinion the 3D doesn't work. Instead of projecting the image from the screen in true 3D style, all you get is two images, one red and the other blue. Even the 3D glasses provided with the game don't pull the two images together and this makes shooting at War Drones very difficult. The only good point is that you can turn the 3D effects off and play the game in MONO, which makes it easier to progress through to gain enough experience to finally confront Vadd. The game itself is nothing flash. The War Drones are wire frame like so many games these days, but are nothing special. As I said, the 3D doesn't appear to work, and there are some sections that are just too difficult. Having said that, I managed to finish the game and was very disappointed by the final screen. You can also save your position at any stage during the game - a useful option before trying to negotiate a black hole.

Wanderer 3D seems to try and take the space trading theme and put into a 3D mode. They have tried hard but it just does not work for me; but it may appeal to some. I strongly advise to try before you buy (if that's possible). Even the free glasses couldn't entice me to have Wanderer 3D in my collection. (Just for interest, the currency Megs is replaced in the 16 bit version by CATS -yes, in the 16 bit version you trade for cats, not currency. I wonder why ELITE chose to make this differentiation between versions? We'll never know!) - Vic Renfrew



XYBOTS

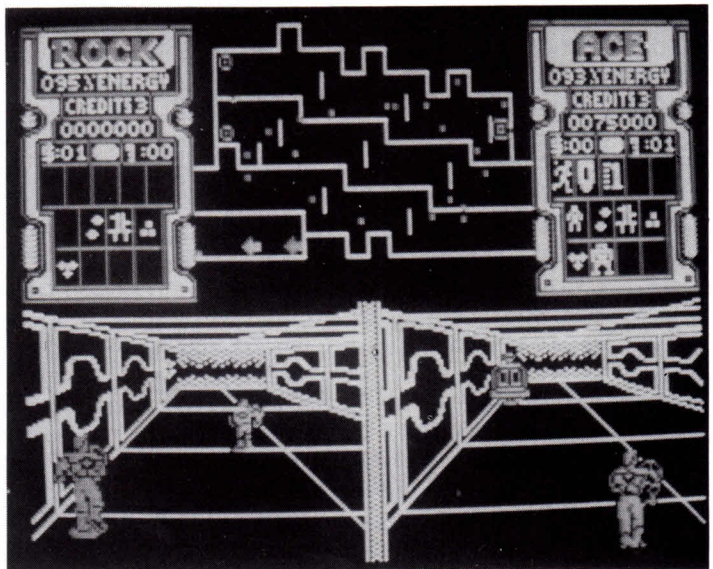
Play a Tengen 3-D game with a mate

CPC Tape - \$24.95

CPC Disc - \$34.95

An announcement in the News Break section of this magazine a few months ago advised readers of a new games label from Domark called 'Tengen'. The idea is to launch coin-op conversions through Tengen, the first of which was Vindicators. The next in line is Xybots, perhaps not an all time classic coin-op but nevertheless pretty well converted in this game for the CPC. It's more than just a 3-D maze game and requires more than just a happy trigger finger. The heroes are Major Rock Hardy and Captain Ace Gunn whose job it is to infiltrate the Xybots complex labyrinth and eliminate the Master Xybot. This should tell you that there is a two player option available if you want it.

The screen is split into a number of sections. The bottom half is devoted to the 3-D playing areas for either player while the top is reserved



for the player's scores and status details on either side of a map. The map is invaluable at the beginning of the game as it shows the positions of the Xybots and the exits. The status details provide information about impending problems and information about weapons.

Of course, the Xybots will do everything in their power to stop you and as you progress through the levels things get a touch more difficult. To keep the odds a little more even, an expended Xybot will leave a coin or other object behind for you to use. The coins can be collected to purchase better weapons, enemy mappers or other useful items from the supply depot. At the start of the game you are supplied with a laser which appears to render the enemy motionless for a period of time. You need to visit the supply store to get a laser capable of eliminating the Xybots permanently.

There are different shapes and sizes of Xybots. Some require more than one shot to remove, others (the big blue ones) are easier but have heavy fire power to avoid. Now and again walls open up and extrude armies of the things. One thing to watch as you travel through is your energy level. This can be consumed at

an alarming rate, especially when fighting the suicide squad, and can only be replenished by finding energy capsules. In later levels these become even more important if only to get from one place to another, let alone using your weapons.

The two player option makes for exciting action, and in some cases can help the cause. Beware though, your partner's 'bullets' can also kill you, and vice versa. So while you carefully suss out what's round the next corner, your mate can tear off and investigate another area and report back. In the original coin-op, the joystick had a twistable top which let you turn around while on the move. The same effect is achieved on the CPC by holding down the fire button and moving the joystick at the same time. This is a plus for CPC owners as it doesn't work on the Atari ST version!

The game cannot boast of having a mass of colours, so green screen owners will have no problems. The graphics are clear (although the characters a little distorted), there are plenty of levels to search and the music adds to the atmosphere. Not a bad game but I question it's lasting ability.

TIMESCANNER

An amazing Pinball game from Activision

CPC Tape - \$29.95

CPC Disc - \$39.95

If you thought that a game of pinball on your CPC was old hat - think again. Timescanner is to a pinball as a CD player is to a phonograph. It starts normally enough with the 'Volcano' table into which you launch your first ball. Using the flippers to bounce the ball onto the bumpers and pins your score soon begins to accumulate. This can increase even more rapidly by hitting certain pins to change the score earned from the bumpers.

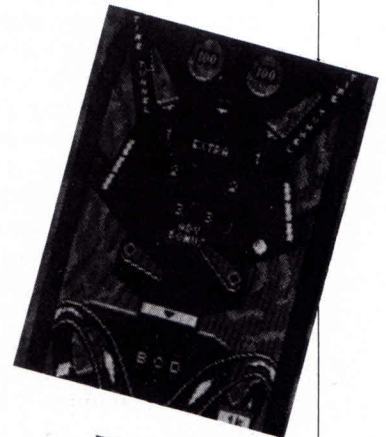
It probably still sounds much like an ordinary computerised pinball game - but wait, you ain't seen half of it yet! Even the best player is going to lose a ball and will eventually have to load the next. Not with Timescanner. As the ball falls the screen scrolls up to reveal the other half of the table and this is where things begin to hot up. Apart from the normal pins and bumpers, there are some tubes which connect to the top part of the screen and so allow access back if you can fire a ball up them. If you are successful, you not only get a bonus of having another go at the top half again but the word 'Volcano' begins to light up. When it is complete, the volcano erupts and you are supplied with three balls at the same time. Flipper frenzy sets in.

Once you have amassed a sufficiently large score you have the opportunity to shoot for the 'time tunnel' to get transported to the next table - Saqqara. This table is a little more sparse but with more traps. The 'time tunnel' takes you to the third table in which is featured a ball collector. When the 'Xtra ball' lights up, all the collected balls are released. The final table presents not

only the pinball concept but brings in a break-out problem as well.

Unlike a standard pinball game, the speed at which the ball moves is much faster adding to the frenetic pace. It takes a few games to get the feel of the flippers and to direct the balls accurately and start getting the big scores. You'll also find that you can 'tilt' the table if you press the correct key at the right time.

Timescanner is a game streets ahead of any other computerised pinball game. It contains smooth graphics, realistic sound effects and is equally playable on both colour or green screen. It lays itself open to massive scores and is exceedingly addictive. It should carry a health warning 'This package may damage your fingers.' Great fun though!



DIRECT ACCESS

It is possible to go one better than the standard AMSDOS file access system, says Petr Lukes

This program demonstrates how to access any part of a disc, without using the sequential file system implemented in AMSDOS. It uses the routines from CUSTOM FORMATS, TAU, February 1988, and could be used as a building block for implementing a Direct Access file system.

Direct Access is often referred to as Random Access, but this term is not very appropriate. A randomly selected record would not be of much use for anything; a particular record is needed, and for that we need some means of locating it. The term Relative Access is also used, meaning that records are referenced in relation to the first record of the file.

Direct Access filing systems incorporate algorithms for computing the location of a record based on its key. An address file would consist of records with fields allocated to surname, initials, etc. with the surname field most likely designated as the key. The filing system would then store and retrieve the individual records using the given algorithm (it could be hashing, binary tree or one of many others), as required. Designing an efficient Direct Access file is not a trivial matter, and I have not attempted it here.

The program merely demonstrates how to read, edit and write any record if its location is known. It considers the whole disc is available to it, without any regard for any reserved tracks or directories. Do not experiment on a disc which holds wanted data.

AMSDOS uses sectors of 512 bytes, each identified by the track number (0 to 39d) and sector number on that track (c1H to c9H in case of a DATA disc); the program uses blocks of the same size as a sector but numbered consecutively from 0 to 359d. For the chosen record size of 128 bytes, there will be 1440 (40*9*512/128) records numbered consecutively from 0 to 1439. A filing system could allocate some records to two or more files or to a directory, the same ways as CP/M does.

One application which would not be too difficult to implement is a year's diary (I know it has been done before, with the AMSDOS filing structure). There would

be enough space for close to two years with two days per block on a normal disc; an alternative would be a disc formatted to 41 tracks by FORMATS (one extra track on the disc should be quite safe; I have tried it but the risk is yours), so giving 369 blocks: enough for one day per block and some overlap of the previous and next years.

```

1 ' DIRECT ACCESS ROUTINES
2 ' By Petr Lukes
3 ' The Amstrad User, Oct. '89
4 '
10 zn$="DirAcc LKS 871007/880428 : Disc Direct Access
Routines for AMSTRAD CPCs."+CHR$(10)+CHR$(13)+"P. Lukes
, 26 Noll St., Toowoomba, 4350."
20 ' Initialise
30 INK 0,26:INK 1,0:PAPER 0:PEN 1:MODE 2:PRINT zn$
40 PRINT"Caution : This programme does not respect any
file structure"
50 PRINT"and will write to any part of the disc!"
60 WINDOW#1,16,79,17,25'buffer display
70 WINDOW#2,1,15,17,25:PRINT#2,CHR$(24)'record informat
ion in inverse
80 WINDOW#3,1,80,1,16'dialogue
90 blocksize%=512:MEMORY 42619-blocksize%'reserve block
buffer
100 recsize%=128:recblock%=blocksize%\recsize%
110 IF blocksize% MOD recsize%<>0 THEN PRINT"Non-integr
al number of records per block"
120 sec1%=&c1'first sector number for DATA=&c1, SYSTEM=
&41, IBM=1
130 'sec1%=&F1'first sector number for special FILE for
mat created by FORMATS utility, TAU Feb 88
140 sectr%=9:IF sec1%=1 THEN sectr%=8'9 sectors per tra
ck for DATA, SYSTEM and FILE, 8 for IBM
150 tracks%=40:blocks%=sectr%*tracks%'total blocks
160 recmax%=blocks%*recblock%-1'highest numbered record
170 fill%=&E5'filler byte for AMSDOS formats
180 'fill%=&A3'filler byte for special FILE format
190 rul$=STRING$(recsize%,fill%)'record indicator
200 PRINT" Set up for"recmax%+1"records of"recsize%"byt
es each,";
210 PRINT recblock%"records per block,"
220 PRINT tracks%"tracks","blocks%"blocks, format ";
230 IF sec1%=1 THEN PRINT"IBM"ELSE IF sec1%=&41 THEN PR
INT"SYSTEM"ELSE IF sec1%=&c1 THEN PRINT"DATA"ELSE IF se
c1%=&F1 THEN PRINT"FILE"ELSE PRINT"unknown"
240 buf%=UNT(HIMEM+1)'start of buffer
250 secr%=4+128:secw%=5+128'Command names: read/write s
ector. Locations are used to store addresses after they
are found by mfcom
260 DIM msecio%(12),faradd%(1)'Arrays for Sec_R/W, 'far
address' for RST 3
270 ' mfcom : find command, save address and RQM select

```



```

.
280 DATA 00,21,FF,FF,e5,cd,d4,bc,d1,d0,eb,73,23,72,79,3
2
290 DATA FF,FF,c9,00
300 c=0:FOR a=0 TO 9:READ x$,y$:mfcom%(a)=VAL("&"+y$+x$
):c=c+mfcom%(a):NEXT a
310 IF c<>38360 THEN PRINT"Error in data":STOP
320 faradd%(1)=&FF:mfcom%(1)=@secr%:mfcom%(8)=@faradd%(
1):CALL@mfc0%():IF faradd%(1)<>7 THEN STOP'find Read_
sector. AMSDOS ROM is no 7.
330 faradd%(1)=&FF:mfcom%(1)=@secw%:mfcom%(8)=@faradd%(
1):CALL@mfc0%():IF faradd%(1)<>7 THEN STOP'find Write
_sector
340 ERASE mfcom%'no longer needed
350 ' msecio : read/write a sector
360 DATA 00,1e,FF,00,00,2a,FF,FF,00,3a,FF,FF,4f,3a,FF,F
F
370 DATA 57,df,FF,FF,00,32,FF,FF,c9,00
380 c=0:FOR a=0 TO 12:READ x$,y$:msecio%(a)=VAL("&"+y$+
x$):c=c+msecio%(a):NEXT a
390 IF c<>53097 THEN PRINT"Error in data":STOP
400 dr$="":WHILE dr$<"A"OR dr$>"B":INPUT"Select drive (
A or B) : ",dr$:WEND
410 dr%=ASC(dr$)-65:msecio%(1)=dr%
420 CLS#3:PRINT#3,"Insert disc in drive "dr$", press EN
TER ";
430 LINE INPUT#3,x$
440 !DRIVE,@dr$:recn%=0:blk%=-1:GOSUB 690'read first s
ector on disc
450 INPUT#3,"Is this the correct disc (n/Y) ";x$:IF x$<
">"Y"THEN 420
460 ' Main
470 recn%=-1:WHILE recn%<0 OR recn%>recmax%
480 CLS#3:PRINT#3,"Enter record number (0 to"recmax% CH
R$(8)) : ";
490 INPUT#3,recn%
500 WEND
510 CLS#3:PRINT#3,"Record number"recn%
520 GOSUB 690'record into z$, display
530 PRINT#3,"Use SHIFT+cursor and COPY/CLR/DEL keys to
transfer and edit"
540 PRINT#3,"old record or enter new record : "
550 LINE INPUT#3,y$:v$=rul$:MID$(v$,1)=y$
560 FOR a=1 TO reysize%:PRINT#3,CHR$(1)MID$(v$,a,1);NE
XT a:PRINT#3
570 INPUT#3,"Is this correct (n/Y) ";x$:IF x$<>"Y"THEN
510
580 z$=v$:LOCATE#1,reysize% MOD 64+1,(part%*reysize%)\6
4+1:PRINT#1,CHR$(24);
590 FOR a=1 TO reysize%:PRINT#1,CHR$(1)MID$(z$,a,1);PR
INT#1,CHR$(24);:NEXT a
600 INPUT#3,"Update buffer (n/Y) ";x$:IF x$<>"Y"THEN 67
0
610 b=part%*reysize%-1+buf%
620 FOR a=1 TO reysize%:POKE a+b,ASC(MID$(z$,a)):NEXT a
'update buffer
630 PRINT#1,CHR$(24):CLS#1:PRINT#1,CHR$(24);
640 FOR a=buf% TO buf%+511:PRINT#1,CHR$(1)CHR$(PEEK(a)
);:NEXT a'show update
650 INPUT#3,"Write to disc (n/Y) ";x$:IF x$<>"Y"THEN 67
0
660 GOSUB 840'record write
670 GOTO 460
680 STOP
690 ' Record read
700 GOSUB 900'convert recn%
710 IF blk%<>cbk% THEN 740'read block if not in buffe
r
720 INPUT#3,"Block is in buffer. Read it again (n/Y) ";
x$
730 IF x$<>"Y"THEN 790
740 CLS#2:PRINT#2,"Block"blk%
750 PRINT#2,"Records"blk%*recblock%"to"blk%*recblock%
+recblock%-1
760 cbk%=blk%:faradd%(0)=secr%:GOSUB 950'sector i/o
770 PRINT#1,CHR$(24):CLS#1:PRINT#1,CHR$(24);
780 FOR a=buf% TO buf%+511:PRINT#1,CHR$(1)CHR$(PEEK(a)
);:NEXT a
790 z$=rul$:b=part%*reysize%-1+buf%:PRINT#3,"Current re
cord : "
800 FOR a=1 TO reysize%
810 x$=CHR$(PEEK(a+b)):MID$(z$,a)=x$:PRINT#3,CHR$(1)x$
;
820 NEXT a:PRINT#3
830 RETURN
840 ' Record write
850 CLS#2:PRINT#2,"Block"blk%
860 PRINT#2,"Records"blk%*recblock%"to"blk%*recblock%
+recblock%-1
870 faradd%(0)=secw%:GOSUB 950'sector i/o
880 PRINT#2,"Block written"
890 RETURN
900 ' convert record number to block, track, sector
910 blk%=recn%\recblock%:part%=recn% MOD recblock%
920 tracn%=blk%\sectr%:secn%=sec1%+blk% MOD sectr%
930 'PRINT recn%,blk%,part%,tracn%,secn%
940 RETURN
950 ' Sector i/o
960 er%=&FF:msecio%(3)=@buf%:msecio%(5)=@secn%:msecio%(
7)=@tracn%
970 msecio%(9)=@faradd%(0):msecio%(11)=@er%:CALL@msecio
%(0)
980 PRINT#2,"Track "LOWER$(HEX$(tracn%,2))
990 PRINT#2,"Sector "LOWER$(HEX$(secn%,2)):PRINT#2,"r/w
error: "BIN$(er%,8)
1000 RETURN

```


MASTERFILE III

FOR THE AMSTRAD CPC6128
(ALSO CPC464/664 WITH DK'TRONICS 64K RAM)

FIRMLY ESTABLISHED...

MASTERFILE III is now firmly established as THE filing system for the CPC6128.

For the benefit of newcomers to the CPC machines: MASTERFILE III is a powerful and flexible data filing and retrieval system. All "database" systems require that your data is organised into fields and records. Unlike most, MASTERFILE does not commit you to field lengths or formats, since ALL data is variable-length and optional. Files are not preformatted, and only used bytes are saved to disc. Also, unlike the rest, MASTERFILE allows multiple user-defined ways of viewing/printing your data. And unique in its price range, MASTERFILE offers RELATIONAL FILE options, whereby common data can be entered just once and shared by many records. Maximum field size is 240, maximum fields per record is over 50, and maximum file size is 64K. Room for 1,000 full names and addresses, for example. Only one disc drive is required. It is menu driven throughout, and comes with detailed illustrated manual, and example files.

SO VERY VERSATILE...

Just about ANY kind of information can be handled by MASTERFILE. You can EXPORT the data to other systems (eg. PROTEXT/MERGE and TASWORD). You can even merge your own USER BASIC to MASTERFILE for customised file processing, or build new files from other computer sources. The speed of SEARCH of MASTERFILE is second to none. Records can be sorted ascending/descending, character or signed numeric, even embedded keys such as surnames. Other functions are field-to-field calculations, and several-across label printing. We simply don't have room to list all the features; give us a call if you are still in doubt of the power of MASTERFILE III.

ALL THIS POWER...

This is no toy thrown together in BASIC and half-tested, but real machine-coded computing power professionally constructed. We have had IBM and Apricot users beg us for a MASTERFILE for their machines - when they had seen the earlier CPC MASTERFILE.

MASTERCALC 128

THE MODERN CPC6128 SPREADSHEET SYSTEM

This is the sister program to the famous MASTERFILE III, and is a fast and friendly spread-sheet program with high capacity (over 7,000 cells) and impressive speed. Like MASTERFILE, it is entirely machine coded. Like MASTERFILE, it needs just one disc drive and does not use CPM and it uses the same optimised RAM bank-switch code. "Another exceptional utility from Campbell" said Popular Computing Weekly of the original MASTERCALC. The "128" edition is more powerful.

All spread-sheet systems allow manipulation of any array of numeric data.

What sets MASTERCALC 128 apart from the rest are these features:

Full-screen or split screen windows; variable column display width; variable column formats, 0-7 decimal places; columns can be formatted individually; ultra high-precision floating point arithmetic; direct totals and sub-totals; up to 99 relocatable formulae (usually 10 is ample!); formulae up to 75 characters, and arithmetic expressions, plus conditions, relative cell references; instant highlight of computed data; store text anywhere;

pop-up help menu; 40/80 column mode; auto cursor-advance; text output to printer or to disc for word processing; fast hi-res histogram of any 3 rows; Epson screen dump; detailed manual with illustrated tutorial.

For the enthusiast, there is even USER BASIC access to the cell data, so that special operations can be performed. For example, it is possible to ship data to/from MASTERFILE III.

MASTERCALC 128 costs just \$99.00 and MASTERFILE III costs \$109.00 including postage and packing, and if you request air-mail within Australia, we'll do that at no extra charge too! (If you live outside Australia please add \$4.00 for air-mail cost. Bankcard, Mastercard or Visa accepted).

Send your order now to:

THE AMSTRAD USER
641 High Street Road
Mount Waverley
Victoria 3149

Tel: (03) 233 9661

Following last month's introduction to Angle Park Computing Centre, let's take a closer look at some of the individual packages available for the Amstrad CPC 6128. The Satchel software range is comprehensive in its coverage of the basics of primary Mathematics and English. Beyond that, there are a number of other packs focusing more closely on a particular age group and on a particular area of the curriculum.

This month we will look at three packs: Mathsbooster, Crosswiz and Picture Book.

MATHS BOOSTER

High on the list of the most mundane things to do in one's life must be memorising the multiplication tables. Our memories paint a picture of a blackboard, covered in columns of numbers and equations behind the "Drill Instructor" cum teacher sitting pensive at a very big desk. Nightmares are made of this. Fear would consume your youthful confidence as your name was called. What embarrassment when you couldn't remember the answers.

Thank goodness there's someone out there with a little more creativity than the Byzantine educators some of us were unlucky enough to have! Mathsbooster "disguises" the rote learning of the multiplication tables and the other arithmetic operations behind a game of space invaders. As pieces of space junk fall from geostationary orbit towards the earth, it is the student's task to save the world by having each piece of debris intercepted by a rocket which then carries it safely off into space. The rocket however, will only intercept the piece of debris if the answer to an equation is entered via the keyboard. If the equation is wrongly answered, the pieces continue to fall, but if the answer is correct, there's one less piece left falling.

There are six pieces at which a rocket must be fired, so each "wave" consists of six equations to answer. The speed at which the

pieces fall increases with every screen completed, until it's pretty well impossible to beat the pace. The challenge of beating the clock is addictive, even if it all only comes down to solving equations.

After every successful completion of two "waves" of debris, the student has to intercept the "shuttle". This makes for a nice sense of achievement.

Behind what the child sees, there's more going on. The teacher or parent can control the level of difficulty and type of equation being drilled, so as to best help each individual child. Mathsbooster can drill the child in all the four areas of addition, subtraction, division and multiplication, or some combinations of these and for each of these the parent or teacher can determine the precise number range the child will be working with, as well as this, the speed at which the objects fall can also be controlled, to help make the game a challenge for every child.

So, the game could effectively be

used in a classroom situation with each child working on their own copy of the program; that copy entirely customised to the needs and weaknesses of that child.

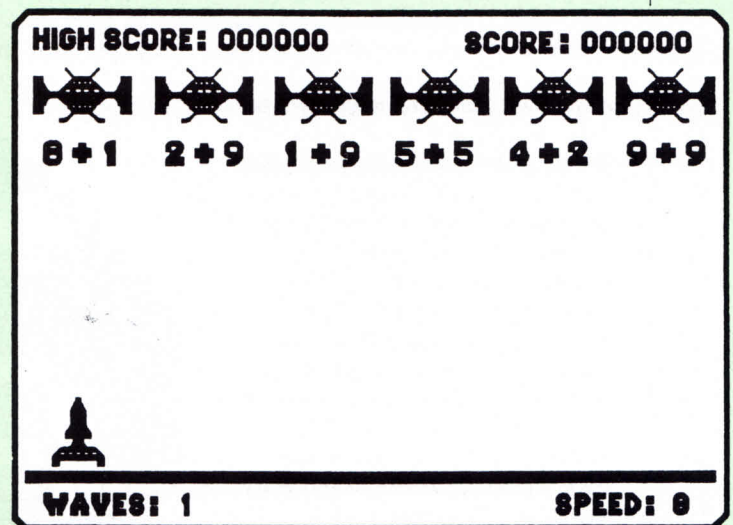
At home, Mathsbooster can be used effectively to support the arithmetic work being taught at school, while the child all the while is finding enjoyment and challenge from what used to be mundane.

CROSSWIZ

Taking a very different tack now, Crosswiz is a gem of a program that

SATCHEL SOFTWARE

Further to last month's introduction to Angle Park Computing Centre, here's a closer look at their Satchel range of CPC titles



First wave in Mathsbooster testing addition skills

allows students to create their own crosswords. The computer takes care of everything, from the positioning of the words in the

crossword, to the printing out of an attractive, neat final product. It is recommended for students from approximately grade 3 upwards, although with assistance, younger

figure 2 shows, different shapes can be drawn to create impressive designs.

The final product can then be printed out to give to fellow

students or family members. It is easy to imagine what home or class projects can be developed around this program.

Whatever the case, the student receives a tremendous sense of achievement and a present to give a friend.

A few points to note: I was able in my experimenting to create a crossword too complex for the Crosswiz. I wanted to squeeze a word

quite correctly between two others, but crosswiz didn't recognise the legitimacy of this. Still, I doubt your average pre to mid-teen would devise such a complex situation.

Secondly, Crosswiz has no spell-checking facility. It will accept wrongly spelt words. So if your child presents you with a crossword to do, be prepared. The answer to "A big grey animal with a trunk and tusks" may well not fit in the

space provided if the expected answer is "Elefant". Still, I guess this adds another dimension to Crosswiz, educationally speaking!

PICTURE BOOK

Arguably one of the world's cheapest desktop publishing packages ever developed, Picture Book allows students to write their own book, with pictures too.

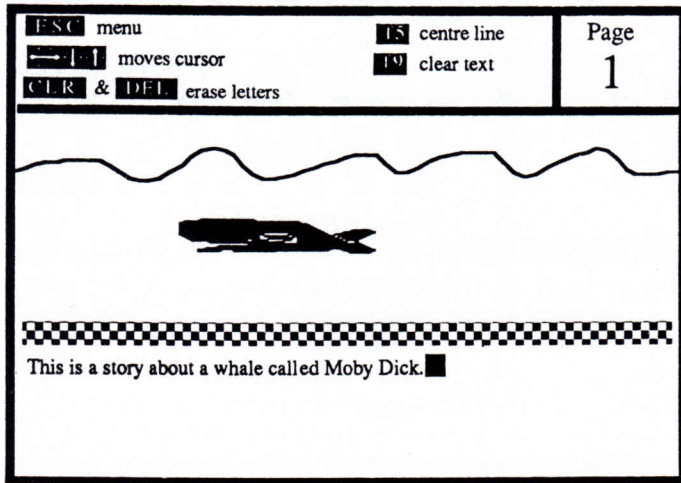
The book can be up to 10 pages long, with pictures and text combined on each page. On disc, over 200 graphic images are provided for the child to use in the book, or alternatively the child can create his/her own to give a more personal touch.

The screen is divided up into two windows: one for the picture and one for the text. The text window is in fact a simplified word processor, allowing up to six lines of text per page. It includes word-wrap, centring and editing facilities, giving primary school children an introduction to word processing at the same time.

Some trouble has been gone to in the graphics department as well. Your own graphic images or those taken from disc can be shrunk or enlarged, flipped horizontally and their on-screen colour can be changed. A number of images can be pasted onto one page at the same time, also allowing students to create reasonably complex pictures from the images provided.

As an added feature, the entire book can be dumped to a printer, page by page. The child can then colour the pictures in as a related exercise. From the point of a teacher, the applications are boundless. The accompanying manual recommends a number of possible applications such as progressive stories, where a different child writes each page, or an anecdotal story where the child relates an experience accompanied by pictures.

Next month we return with more from Satchel, including a big adventure game called Java Tira.

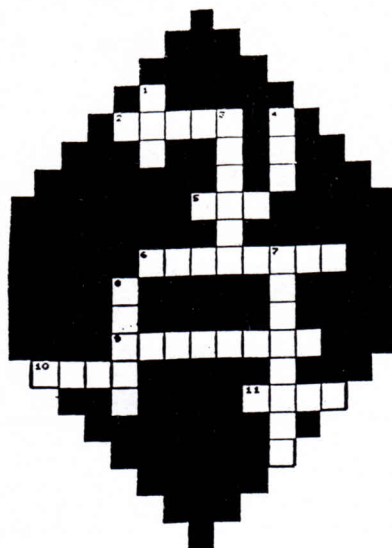


Story edit menu from Picture Book

children might also find enjoyment from it.

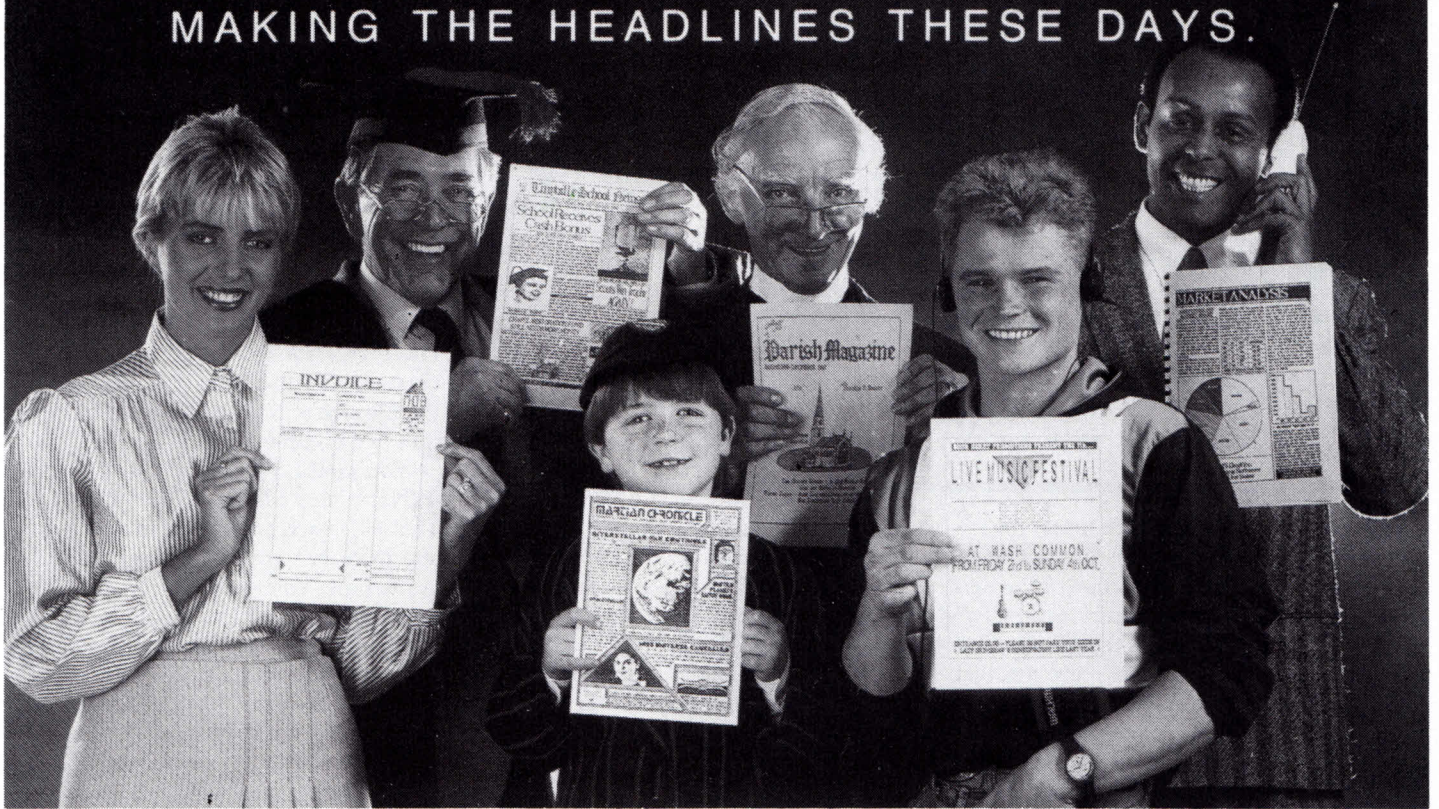
Immediately obvious is the user-friendliness of the package, this being virtually a trademark of Satchel. You simply type run disc to load Crosswiz, and you are presented with the main menu. From here it's straight into creating a new crossword. The child enters a word via the keyboard, positions it on the board (20 x 20 characters) and then provides a clue. The next word is then entered into the computer, which automatically positions that word in a logical position. If the student preferred the word to go elsewhere, the program will automatically determine every possible position for the word within the crossword. When the student is happy with the position of the word he/she drops the word in and then enters a clue. This continues until there is no more room for words (usually about 40 words will fit) or the student decides there are enough entered.

As a jazzy little detail, the student can now alter the crossword to get away from the basic square shape by removing some of the black spaces that are left behind. As



Example output from Crosswiz

IT'S SURPRISING THE TYPE OF PEOPLE
MAKING THE HEADLINES THESE DAYS.



STOP PRESS

'Stop Press' puts you right at the heart of the Desktop Publishing Revolution. Utilising dynamic WYSIWYG (What You See Is What You Get) facilities, 'Stop Press' makes it simple to create professional newsletters, leaflets, flyers, forms or in fact anything where text and graphics is required.

'Stop Press' is the ideal publishing software solution for home enthusiasts, schools, societies and small businesses.

READ ALL ABOUT IT

Documents may be prepared using any of the superb selection of type faces (12 or more) supplied or alternatively a typeface of your own design.

Text can be entered from within 'Stop Press' or imported from your preferred word processor with fully automatic on-screen text formatting as the file loads.

Centering, ragged right, and literal justification are all available. There also also is full pixel resolution control over character size and spacing.

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As well as the ability to import digitised images there are outstanding facilities for drawing, spraying and painting using either the patterns supplied or your pattern designs, enabling you to produce

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At anytime your pages can be previewed before being output to a wide range of Epson or compatible dot matrix printers.

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'Stop Press' can be used with a joystick or keyboard but the AMX MKIII Mouse gives you the control and flexibility which you would expect from the most accurate pointing available. Produced in Switzerland the AMX

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PCW Mouse With Interface	\$165.00
CPC Extra! Extra! Clip Art Disc	\$89.00

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CP/M+ - JUST THE FACTS MA'AM

Mike Turner this month looks at some other utilities in detail. To get the best from your CP/M+ system, read this.

Greetings once more. As promised last month, we will start looking at some of the other files you will find on your CP/M+ master discs. In that process we will also look in some more detail at other utilities that have until now been glossed over in this series.

So let's start with one of these. Let's look in a bit more detail at HELP.COM and how to make better use of it. The manual that came with your computer doesn't say much about it. I guess that's fair enough as the program is fairly self explanatory. But what if you don't like the explanations given in the program covering various topics. Or you may wish to add new topics to the list. There is a way to do this, although you aren't told this in your manual. The two commands you will need to use are **HELP [extract]** and **HELP [create]**.

WITH A LITTLE HELP

You will recall that the help utility uses two files to function properly. The first is HELP.COM and the second is HELP.HLP. It is the HELP.HLP file that contains all the goodies you want to know. If you go to edit HELP.HLP to make changes or add things, you will run into strife. The reason is that this file contains an unprintable topic index used by the HELP.COM program. The command **HELP [extract]** when typed at the system prompt will cause help to make a copy of this information file with the filename HELP.DAT. The resulting file may be edited with a word processor or

text editor such as WordStar, Tasword, RPED or ED.COM. You can now edit existing topics to make them clearer to you or add new ones if you wish.

Each new topic or sub-topic you add must begin with a line in the following format: `///nTITLE`

The three slashes indicate the start of a topic area. The n refers to the level of the topic; 1 for a main topic, 2 for a sub-topic, 3 for a sub-subtopic and so on ad infinitum. Well, not really. There is a limit of nine levels of topics. Exceed this and the program will crash. Substitute the name of your topic for the word TITLE. The name you use must be in upper case, must not exceed twelve characters and must appear in the file in alphabetical order with all the other topics. Sub-topics must also be in alphabetical order within their particular topic area.

One word of warning, concerns the use of word processors. Make sure that when you edit and/or save the HELP.DAT file, that it is done in non-document mode. Those of you with a word processor such as WordStar will know what I am talking about. Alternatively if you have an option on your particular processor to make an ASCII file, then use it. The aim of the game is not to have any non printable control characters inserted into the file by the word processor.

The last step is to convert your new HELP.DAT file back into a HELP.HLP file, which is done with the **HELP [create]** command. Try this out for yourselves if you wish.

You will need to copy the HELP.COM and HELP.HLP files onto a working disc. This ensures that your originals of these files remain unchanged. Also make sure that you have enough space on the disc to make the HELP.DAT file. Remember that this will start life being at least the same size as the HELP.HLP file from which it is created. As you add to it, of course, the file size will grow. Detailed help files can become quite large.

You might consider having different help files on different discs. That way each one can be made specific to the application being run at the time. You could even make up a dedicated help file with all the commands for a particular program you are using. It can prove a lot more efficient than hunting frantically through the manual, only to be referred to several different sections, before getting the answer you want.

SETTING THE DEFAULTS

In the remaining space this month, I want to cover the use of three other utilities. They are SETDEF, INITDIR and SET. We have already used two of these in past tutorials, but only to a limited degree. Now I want to go into them in a bit more depth, so that you can better use them in managing your system.

Firstly, SETDEF. This command establishes the operating mode for your computer. In other words you can set up the defaults for your system to your liking. The command by itself will display the current settings. So what can we set with this command? Well firstly we can set a default drive path as we did in a previous tutorial. This is done with the command **SETDEF drive, drive,...** So to cause the system to search on the M drive then the B drive and finally on the A drive, the command would be **SETDEF M:, B:, A:**

A message would result on the screen showing the default path that has been set. A maximum of four drives may be specified. Amstrad owners are unlikely to ever need more than this. The code for the

drive can be a letter as in the example above or an asterisk to represent the default drive, (the one you are in at any particular time).

Allied to this is the command **SETDEF [temporary=d:]** where **d** represents a particular drive. This causes the system to place any temporary files onto that particular drive. This can be particularly handy with programs that write scratch or working files to the disc whilst they work. Quite often these files are deleted after the event but they still occupy space at the time. If space is critical on your particular work disc this command can help by specifying another disc onto which the scratch files will go.

Note that this doesn't always work. Some programs are inherently dumb and don't ask the monitor which drive to use for different functions. Instead they just dump everything onto the default drive. Still most of the time it will work for you. Another point worth noting, is that if you have a RAMDISC or memory drive, it is often worth using this for the temporary files. As these are normally associated with calculations of some kind, you may find that the program in question will run faster if the scratch files are in the M: drive. PCW owners take note.

So what other options are available to us with this command? There are three. They control Console Page Mode, Console Display Mode and the Order in which files are accessed. Let's look at Paging first. By default your system comes up in page mode. So when you ask for a directory of a disc containing heaps of files, it gets displayed a page worth at a time. You will be prompted to press RETURN to continue at the bottom of each page until there is no more to display. Using the command **SETDEF [no page]** will turn off this function. The massive directory will continually scroll up the screen without stopping unless you use **CTRL+S** to stop and start the scroll.

Another example of this command being useful is when it is

associated with the TYPE command. Say I have a text file called MYTEXT.DOC on the disc. If I wanted to view it on the screen I would use the command **TYPE MYTEXT.DOC [RETURN]**. The file would then be presented a page at a time on the screen. But what if I wanted to print it out using the printer echo function of CP/M+?

"You could even make a dedicated help file with all the commands for a particular program you are using."

This is accessed by pressing **CTRL+P** and causes everything that is sent to the screen to also be sent to the printer. Pressing **CTRL+P** again will turn the printer echo off. If page mode was on, all the "Press RETURN to Continue" messages at the bottom of each screen would also be printed. By turning Page Mode off with the command mentioned above and then using the TYPE command, I will get a continuous printout of the file without annoying gaps and other messages. The Console Page Mode can be turned on again with the command **SETDEF [page]**.

SETTING THE DISPLAY AND ORDER

Next we will look at the commands **SETDEF [display]** and **SETDEF [nodisplay]**. This works in the same manner as for the Page Mode except that it controls Display Mode. Display Mode is set to off by default when you start CP/M+. If you turn it on you will cause the system to display the filespec and user number of each command used as it is loaded. So if you are in another user area and access the file DIR.COM in user 0, this will be displayed for you as the file is accessed. I find this

tedious and leave it turned off to speed things up a bit. But by all means try it out for yourself, if for no other reason than to prove that it works.

The last thing to cover with SETDEF is the Order option. This controls the order in which command files are searched for on the disc. The normal order is to look for all files with a .COM suffix before looking for files with a .SUB suffix. So when you type in the command MYPROG at the system prompt the system will look for a file called MYPROG.COM on the disc. This is the way the system comes up by default.

The command **SETDEF [order=(com,sub)]** causes an interesting thing to happen. If the file MYPROG.COM can't be found and the file SUBMIT.COM is present somewhere on the assigned drive path, the system will cause a file called MYPROG.SUB (if it exists), to be automatically submitted as if it were a command file. So with this command put somewhere in your PROFILE.SUB file you will no longer have to type SUBMIT MYPROG to activate this file. You may just input the name in the same way as you do for normal files with a .COM suffix.

The command **SETDEF [order=(sub,com)]** works as above but reverses the order of the search. It will look for a .SUB file of the name input before searching for a .COM file. To restore the system to the state it is normally in on start up, you would issue the command **SETDEF [order=(com)]**.

CLEANING UP YOUR DIRECTORY

Now let's look at the INITDIR and the SET commands. These two you will find are linked together. To get the full value out of SET you have to use INITDIR first. So what is INITDIR? Basically it is a command program that reorganises the directory of a disc. Once reorganised, the directory will then accept such things as timestamps and password protection. The command is simple: **INITDIR d:** where **d**

stands for the drive containing the disc whose directory you want to reorganise.

There are trade offs in the use of timestamps and the like. The major one is that INITDIR will not work on a disc that has more than 75% of its directory entries used. The reason is that one directory entry in four is reserved for holding timestamp information about the other three. So if you intend to hold a lot of small files on a disc and you will exceed 75% of the allowable number of directory entries, then this is not for you. The SHOW command will help you here. It can be used to show details about a disc including the number of directory entries both in total and available. But more on that command next month. For now it is sufficient to know that you will rarely exceed a 75% usage of the number of available directory entries for a disc. The larger the files the fewer on the disc and the less directory entries needed.

GET SET FOR MORE OPTIONS

And so finally this month, let's look at the SET command in more detail. We have already used this command early in this series to change the attributes of a file from DIR to SYS and back again. But SET has quite a few other uses. SET can be used to make an individual file or indeed a whole disc drive either Read Only or Read Write. It can be used to put an electronic label on your disc, for enabling timestamping of files and for enabling password protection. It can also be used to change the level of protection used in association with these passwords. So it can be seen that SET can be used to change things about both files on discs and the drives that hold them.

As space is running out again for this month, I will look at the simpler options first. I will cover each of these points fairly briefly, as the syntax involved is not hard. Then I will look in a bit more detail next month at password protection and planning for data security. This involves some more advanced uses

of the SET command.

But for now let's look at the commands that apply to files on discs. The first one we are familiar with and it concerns file attributes. **SET filespec [option]** where filespec stands for the name of the file and option stands for the attribute we wish to have applied to the file. A classic example is **SET SHOW.COM [SYS]** which will change the file SHOW.COM so that it disappears from the directory of the disc and becomes a system file. The reverse

“SET can be used to make an individual file or indeed a whole disc drive either Read Only or Read Write.”

of this is **SET SHOW.COM [DIR]** which puts things back the way they were.

A similar command determines whether a file can be changed or erased during work. The same syntax **SET filespec [option]** is used but this time the options available are RO for Read Only and RW for Read Write. The advantages of making important files RO is fairly obvious. It isn't foolproof, but generally speaking, RO files cannot be erased, renamed or written to by a program.

There are seven other options available under SET. The first two are **Fn=ON** and **Fn=OFF**, where F stands for an application defined attribute and n stands for a number between one and four. These have no practical use for you as the operator of the machine. These attributes are sometimes used by certain pieces of software to keep a track of various sorts of files. If you have some software like this that is doing strange things and jumbling

up your files, these options allow you to reset or alter these attributes and correct the problem. You will normally never get involved in this sort of thing. I can't think of a commonly used program for the Amstrads that would require the use of this option. Still, now you know. It might come in handy some day.

The next options to look at are **ARCHIVE=ON** and **ARCHIVE=OFF**. Fairly obviously these allow you to set a file's archive attribute. This is normally set by PIP when using the [A] option of that command. It allows PIP to keep a track of which files it has copied and which it hasn't. This can speed things up with back-ups, as you will only be copying files that have been added to the disc or changed since the last back-up. Should you need to change this for any reason, this SET command will allow you to do so. You might for example need to make multiple copies of different files for back-up purposes. This command allows you to reset the archive flag and fool PIP into copying the file again to another disc.

The last three options are **PASSWORD=password**, **PROTECT=level** and **DEFAULT=password**. These all relate to password protection of files which will be covered next month along with the other SET options related to Drive Status, Labels and Timestamps.

Well folks time has yet again run out. We have covered a lot in this session and there is plenty more interesting stuff coming up in future issues. Hopefully this series plus those appearing on Assembly Language and the various reviews of CP/M+ software that appear in TAU will all serve to make you more comfortable with CP/M+. It is, after all, quite a good operating system for small computers. We are well on the way to a decent understanding of the system from our work so far. Stick with it and don't be afraid to experiment with your newly acquired knowledge. Happy Computing.

Joined up writing on a PCW8256? Yes, use LocoFont!

LocoFont Set 1 & 2 give you ten distinctive tpestyles on the PCW's built-in matrix printer.

With LocoFont your PCW printer can print in a variety of different tpestyles. A total of fourteen styles are available in Set 1 and Set 2.

A set of LocoFont tpestyles consists of a disc including a "character set" file for each of the extra tpestyles, together with full installation instructions. Except for Old English, all styles include all of the characters provided by LocoScript2. Briefly, all you need to do to access the fonts is to copy the files to the Start-of-Day disc and update the Settings file. To use one of the new tpestyles, simply select the appropriate character set.

The Sans Serif style has been designed with the same character widths as the standard style. So Sans Serif documents lay out identically to the standard style. The other new styles have different character widths and documents using these may lay out in a slightly different way.

The two "Mini" styles are designed for use at eight lines per inch, giving more characters to the page. The rest are intended to be used at six characters per inch.

Note that a document can only use a single style.

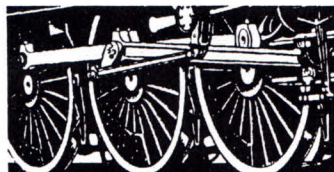
LocoFont Set1 & 2 are available from The Amstrad User at \$75.00 and \$65.00 respectively.

LocoScript2 - New Edition!

If you haven't already, now's the time to move up to LocoScript2 - the better word processor for the PCW.

Not only have we released LocoFont (which only works with LocoScript2), but for LocoScript2 itself now comes with two highly quality tpestyles. And if you want to use a different printer, we now support over 250 matrix, daisywheel and laser printers - but for some, you may need the Printer Drivers Disc

The new edition of LocoScript2 costs \$87.00. Buy LocoScript2 together with our spelling checker LocoSpell for \$130.00 saving \$32 on the combined price. To complete the family, add LocoMail for \$105.00.



LOCOMOTIVE SOFTWARE

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Phone (0306) 740606

LocoFont - Set 1

Definite
We have been forced to adopt a tougher approach regarding returns of faulty product. We request that you now call our office on the number....
ABCDE abcde aBy&c ABFAE aBrrr AEBFr

Roman
All amounts are now expressed inclusive of Value Added Tax. The amount still remains payable at the prevailing rate, subject to the....
ABCDE abcde aBy&c ABFAE aBrrr AEBFr

Script
We're glad to hear that you enjoyed the little "surprise" party that we threw for you. The flowers were father's idea and he even chose them....
ABCDE abcde ABTDE aBy&c aBrrr AEBFr

Copper Plate
You are invited to join in with another of Ted's housewarming parties. This time if you want anything other than hotdogs, crisps and beer then....
ABCDE abcde aBy&c ABFAE aBrrr AEBFr

Standard
Please find enclosed confirmation of your order for an additional 50 brass fittings with screw threads. There is a five percent increase to our....
ABCDE abcde aBy&c ABFAE aBrrr AEBFr

Modern
After you have disconnected the rear cover, gently remove the card marked screen and place it to one side. You should not attempt to force any of ...
BCDE abcde aBy&c ABFAE aBrrr AEBFr

Capitals
SALE :
1000 - GOOD LITTLE RUNNER, NEEDS A LITTLE WORK. TAX AND M.O.T. UNTIL JANUARY 89. NEW SUBFRAME, BRAKES ...
BCDE ABCDE ABFAE ABFAE ABBFr AEBFr

Deco
Avocado Pear £1.95
Prawn Cocktail £2.50
Paté £1.95
Cantaloupe Melon £1.95
BCDE abcde aBy&c ABFAE ABBFr aBrrr

Finesse
St David's School - Summer fête 88
This year's fête will be even bigger than last year's. We hope to exceed last year's fund raising efforts
BCDE abcde aBy&c ABFAE aBrrr AEBFr

LocoFont - Set 2

Penman
This will probably be the longest letter that I have ever written to you. I just haven't had time to put "pen to paper" since I started my....
ABCDE abcde aBy&c ABFAE aBrrr AEBFr

Mini 15/17
The software contained in this package is supplied on the terms and conditions indicated below. Opening of this package indicates acceptance of...
ABCDE abcde aBy&c ABFAE aBrrr AEBFr

Old English
The Old Antique Shop
27 The Square, West Street
Somerton, Somerset
SA23 4BN
ABCDEFGHI abcde

Mini PS
You should follow very carefully the installation instructions enclosed with this package. Do not start to use the package until you have first...
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FILLING THE GAPS

Things get a bit more complicated this month as Gary Koh further explains the use of algorithms

Last month we had a look at a simple fill algorithm that had no memory. This month we will be looking at a proper flood fill capable of filling in complex shapes.

With last month's type of algorithm it would be almost impossible to produce a storage facility. Since it only tests the pixel in one direction there are many problems in trying to figure out which direction in which to fill a particular thing. Consider if an area is to be filled branches off from the main area. It goes left, up, then right, like the [character. The left side fill would proceed along it, but once we reach the section that heads right we are stuck because the algorithm tests the pixel on only one side of the line. How are we going to detect that bit if we are only testing the left pixel?

The answer is that we cannot, so this method gets chucked straight out into the bin. The answer here is obviously to test both sides all of the time. This will make things a bit slower but ensures an accurate fill. Here is an outline for this algorithm in pseudocode.

```
Outline of flood fill algorithm
col=colour of the pixel we are on
pencol=colour to fill
If col=pencol Then Do not continue
Store the location of the pixel we are on
While fill is not finished Do
  Begin
    Move to pixel that is stored
    While pixel we are on=col Do Move up by one pixel
    While pixel we are on=col Do
      Begin
        Move down by one pixel
        If pixel to the left of pixel we are on=col Then
          Store the location of this pixel
        If pixel to the right of pixel we are on=col Then
          Store the location of this pixel
      End
    End
  End
```

This is just a simplified description; many other

things need to be considered as well. To store the areas to be remembered we will be using what is called a stack (remember part 1?).

A stack is quite literally, "a stack". It is a block of memory, or an array that is set aside to store and retrieve data on the Last In, First Out or LIFO principle. Imagine that you have a stack of paper. When you add things to the stack it grows upwards (computer stacks can defy the law of gravity by growing downwards). Say you wanted to store the number 3,483 on the stack. You would write it on a bit of paper and put it on top of the stack.

If you wanted to take things off the stack you can only take it from the top, hence LIFO. If what you wanted was 100 pieces of paper down the pile you would have to take off 100 pieces of paper to get it, though it was put on the pile a long time ago. If that sheet of paper was put on last, then you could get it straight away.

On a computer things are very different to a proper stack. Instead, a block of memory is set aside for the stack and a variable is used to keep track of where the stack is. There are some stacks actually operating on the Amstrad all the time. One stack is really to do with machine code and can only be used in (Guess what...) machine code. Another one is used by Basic to keep track of things like gosubs, wends, nexts and other things.

Now that we have a firm idea of what a stack is we

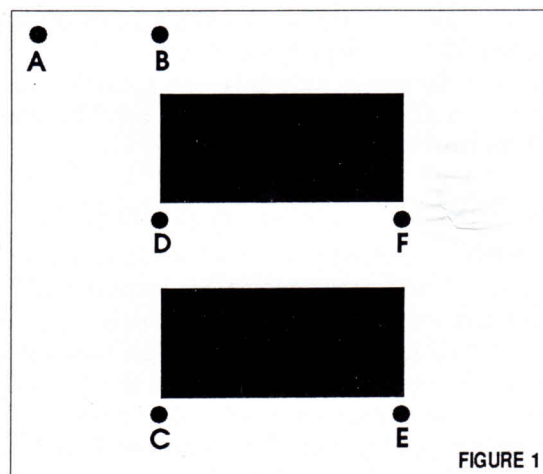


FIGURE 1

can look at the full pseudocode description of the fill algorithm.

```
Flood fill algorithm
col=colour of the pixel we are on
pencol=colour to fill
if col=pencol Then Do not continue
storex(100), storey(100) for stack storage
storex(1)=x location of pixel we are on
storey(1)=y location of pixel we are on
spoint=2
```



```

Repeat
  Begin
    spoint=spoint-1
    Repeat
      Move to pixel at locations storex(spoint),storey(spoint)
      until pixel we are on=col
      While pixel we are on=col Do Move up by one pixel
      Move down by one pixel
      topx=x location of pixel we are on
      topy=y location of pixel we are on
      While pixel we are on=col Do
        Begin
          If lflag=true Then
            If pixel to the left of the present pixel=col and
            spoint<101 Then Do
              Begin
                storex (spoint)=x location of pixel to left
                storey (spoint)=y location of pixel to left
                spoint=spoint+1
                lflag=false
              End
            If rflag=true Then
              If pixel to the right of the present pixel=col and
              spoint<101 Then Do
                Begin
                  storex(spoint)=x location of pixel to right
                  storey(spoint)=y location of pixel to right
                  spoint=spoint+1
                  rflag=false
                End
            If pixel to the left of the present pixel<>col Then
              lflag=true
            If pixel to the right of the present pixel<>col Then
              rflag=true
            Move down by one pixel
            Until spoint=0
            Move up by one pixel
            Draw a line from (topx,topy)to the pixel we are on
            lflag=true
            rflag=true
          End
        End
      End
    End
  End

```

There are two main loops and two minor ones. The main loop that controls the entire thing only stops when there are no more locations left in the stack.

The first few bits do the general setting up of the routine and are similar to the ones in last months listing. The real business starts with the Repeat, which controls the entire process of filling. I have used a repeat instead of a while because it simplifies things and makes things look neater.

The first thing that happens in the loop is to take a stored location off the stack and fill a vertical line there. The reason I had to enclose that small bit in the repeat

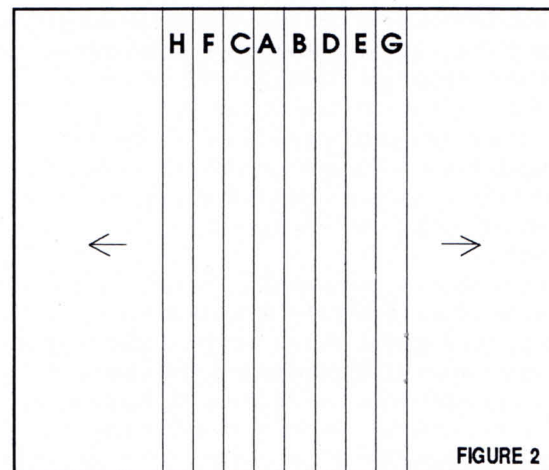
loop was to make sure it did not go to a location that had already been filled.

The fill algorithm sometimes backtracks and fills in a small area beforehand. Figure 1 shows you what I mean. The fill is filling across from the vertical line on point A to B. As it scans along the line next to those 2 blocks pointed to by A it will store location D then C. Point C is now on top of the stack and it will fill along from point C to E. Finally it starts filling from point F to point D. The problem now is that point D has been stored, but that area has already been filled. That is why we need that Repeat until, in order to trap things like that.

After variables have been set up the main scanning loop starts. The first two ifs check on either side of the line we are scanning along, for a pixel with color col. If there is then they store its location to the stack, as long as it is not full. The flag variable concerned, either rflag or lflag are reset. These flags make sure that ALL the pixels that are color col are not stored, only one for each bit branching off.

The last two ifs reset either of the flag variables when a color that is different from col is encountered. This means that there are breaks between blocks of col and puts the first two ifs back into action.

After this it then takes a stored location, moves to it and goes to fill another line. To avoid the need to move along towards one side, the routines just stores locations and fills a line from them. If this is a bit hard to understand then look at figure 2. The vertical columns



represent lines of pixels. Suppose that you start at line A. Location B would be the location stored on top of the stack as the routine scans column A. As it scans column B it would place location D on top of the stack. It would then continue right until it was stopped then location C would be on top of the stack and we would start moving left.

Listing 1 gives a Basic listing of the algorithm. There are quite a few differences between this and the pseudocode listing on account of the Repeat untils. The main repeat until has been replaced by a while, however I

simulated the other Repeat until using an If to replace the until bit that controls the loop.

The fill is guaranteed to be foolproof, as long as the stack space is not exceeded. To use the routine you call it in the same way as last month's fill, but you have to dimension the arrays storex(100) and storey(100). These arrays form the stack. 100 positions should be ample enough storage for most people. The example bit that gets filled itself uses 62 positions on the stack. If however that is not enough for you, you can change it if you want to. Remember also to change the spoint<101 that you see in some of the If-Thens to spoint<(add one to the amount of positions in the stack).

Unfortunately this fill is very, very slow, even though it uses integer variables instead of real variables. If you want to add integer variables to last month's fill put in Defint a-z somewhere, which makes the computer use integer variables. This speeds things up by about 15 to 20 percent. I am giving you a faster fill algorithm next week. This one cheats a bit by using a tiny bit of machine code. It is faster, but still a bit slow. The following few paragraphs are for machine code programmers and relate to making this routine/algorithm faster.

You may be curious as to why I made the fill search up and down instead of side to side. The reason for this is pretty complex and relates to machine code. One way to speed it up is to completely machine code the algorithm. However, it will still be a bit slow, as evidenced by the fill routine in Screen Designer. The reason for this is the firmware. Remember my graphics series? The poor old firmware has to deal with so many different things that it tends to be fairly slow.

There is only one way out, and that is to go the whole way with machine code and work totally independently of the firmware. The fill on the CPC6128 works this way. That is why it works so fast. But what has searching up and down got to do with making a fill faster?

Remember the plot algorithm in Basic in my Graphics series? I do not have the space here to reproduce that listing, but it should prove a useful exercise to you to try to translate it into pseudocode. (Hint, hint).

If you want to go the whole way in machine code there are two ways you can do this. One way is to write a totally self contained plot and test routine and call this each time from within your fill routine. These would in effect replace the Firmware routines.

There is another alternative which is more complex and relates to searching up and down. This alternatively is to incorporate the plot routine directly into your routine. When you plot a point onto the screen you need a pixel mask and pen mask.

If you search across the screen you will have to recreate the masks all over again, and having a separate plot routine also means it will recalculate the screen address each time. If you search up and down then, because of the way the screen is mapped you do not

need to recalculate the masks. And also, if you incorporate the plot routine and test routine directly into the main part of the fill, you will have less processing time finding the screen addresses of pixels, since you can find the pixel below one by simple calculations.

Doing the routine this way will make it blindingly fast. The only problem is that it gets very messy and complex. I am not a good machine code programmer, but there must be a few out there. I have shown you the means to do a very fast fill, why don't you have a go?

LISTING 1:

```

100 ' Demo part
110 DEFINT a-z
120 '
130 DIM storex(100),storey(100)
140 MODE 1:INK 2,8
150 MOVE 50,120:DRAWR 380,0,3:DRAWR 0,-45:DRAWR -380,0:
DRAWR 0,45
160 LOCATE 5,19:PRINT"This is a test"
170 LOCATE 5,20:PRINT"Of the fill algorithm"
180 LOCATE 1,1
190 pixwid=2:pencil=2:MOVE 54,115:GOSUB 310
200 END
300 ' Flood fill routine
310 true=-1:false=0
320 col=TESTR(0,0)
330 IF col=pencil THEN RETURN
340 storex(1)=XPOS:storey(1)=YPOS
350 spoint=1
360 lflag=true:rflag=true
370 MOVE storex(spoint),storey(spoint)
380 WHILE spoint<>0
390 WHILE TESTR(0,2)=col AND YPOS<400:WEND:MOVER 0,-2
400 x=XPOS:y=YPOS:topx=x:topy=y
410 WHILE TEST(x,y)=col AND y>-1
420 IF TEST(x-pixwid,y)<>col THEN lflag=true
430 IF TEST(x+pixwid,y)<>col THEN rflag=true
440 IF lflag THEN IF TEST(x-pixwid,y)=col AND spoint<10
1 AND x>0 THEN storex(spoint)=x-pixwid:storey(spoint)=y
:spoint=spoint+1:lflag=false
450 IF rflag THEN IF TEST(x+pixwid,y)=col AND spoint<10
1 AND x<639 THEN storex(spoint)=x+pixwid:storey(spoint)
=y:spoint=spoint+1:rflag=false
460 y=y-2
470 WEND
480 MOVE topx,topy:DRAW x,y+2,pencil
490 lflag=true:rflag=true
500 spoint=spoint-1
510 MOVE storex(spoint),storey(spoint)
520 IF TESTR(0,0)<>col OR storex(spoint)>639 OR storex(
spoint)<0 THEN 500
530 WEND
540 RETURN

```

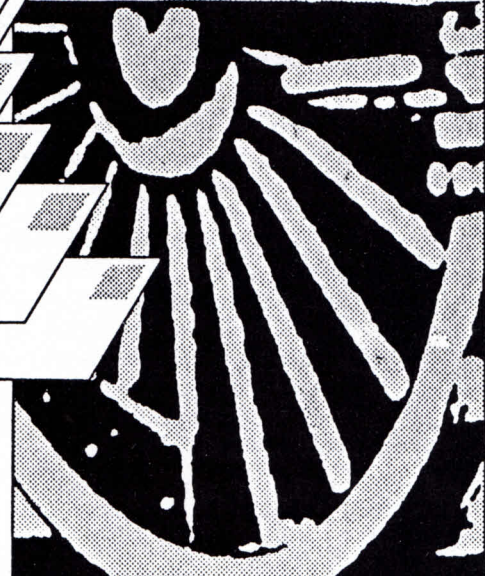



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THE FORTH DIMENSION

In the name of discovering new experiences, here's Roger Williams to have a look at the programming language FORTH+, found on Public Domain disc #612/812.

FORTH+ is on side two of the same Public Domain disc which contains SCI, the subject of my previous three articles. I find FORTH quite fascinating; its structure is totally different from BASIC, C, or any of the more common programming languages. Here is a simple comparison to show how a quite simple arithmetic computation would be programmed in the three languages I have mentioned:-

```
BASIC: PRINT (2+3)*4
C: printf("%d\n",(2+3)*4);
FORTH: 2 3 + 4 * . CR
```

In both BASIC and C, parentheses are used to control the order of the arithmetic operations, and the format is called "infix", meaning that the operators (+ and * in this example) are placed between the operands (the numbers 2, 3 and 4). FORTH will NOT accept brackets for arithmetical computations, and the format is called "postfix", or "reverse Polish", meaning that the operators are placed after (to the right of) the operands. Anyone who has used a Hewlett-Packard calculator will be quite at home with FORTH arithmetic; other readers have an interesting learning experience awaiting them.

Let's get set up to experiment with FORTH through our P.D. FORTH+ version. CP/M+ is required. As usual, you should not

attempt to run the program on your original disc, but should make a working disc by copying the relevant files from your write-protected original.

If you have a printer, you should make a listing of FORTH+.TXT. Next, choose an existing CP/M+ work disc with plenty of free space, or format a new disc in CP/M+ system format, and copy your CP/M+ .COM file onto this new disc. Now, use PIP to copy FORTH+.COM and FORTH.SCR from your original to the work disc.

You should also copy D.COM to your work disc; it is more useful than the inbuilt DIR command in CP/M. A copy of PIP.COM is also advisable so that you can regularly backup your screen file. Use D to check that both FORTH+.COM and FORTH.SCR are on your work disc.

On a CPC6128, starting up FORTH+ can be a bit disturbing; PCW users may find a similar problem (I haven't been able to check). With CP/M+ running, make sure that you have set CAPS LOCK because FORTH+ expects all keywords to be entered in upper case, and then type FORTH+ and press RETURN. I invariably get the message

```
A FORTH SCR file does not exist:
create it?
```

You ABSOLUTELY MUST press the N key in response to this

question (The file handling interface of FORTH+ leaves quite a bit to be desired; more on this later)! You will be asked for a new file name. Type in FORTH.SCR and press RETURN. You should be rewarded with the sign-on message

```
8080 Fig-Forth 1.1+
```

On the second try FORTH+ finds the screen file which it reports as missing on the first try. Not nice!! Running FORTH+ from the original disc (which you should not really try) does not produce this "hic-cough." Definitely a "bug" in the program.

Try out the bit of FORTH arithmetic shown above; the answer should be 20. Try it without the CR at the end. Don't overlook the dot or nothing will be printed; the dot is FORTH's equivalent of BASIC's PRINT. While you have FORTH+ running, here are a few more experiments you can try; where you see <sp> in the examples, press the space bar and where you see <cr>, press the RETURN key. First, type this line -

```
2<sp>SQUARE<sp>.<cr>
```

Don't miss the dot near the end. You will be told that SQUARE is undefined. Now type the following line -

```
:<sp>SQUARE<sp>DUP<sp>*<sp>.<cr>
```

If you typed this in correctly you will just get the OK prompt. Try

```
2<sp>SQUARE<sp>.<cr>
```

again. This time the number 4 should be displayed. You have taught FORTH a new word (a bit like LOGO which can also be taught new words using its TO primitive).

Type 1 (that's a one) followed by <sp>LIST<cr>. On your display you will see "screen" number one from the file FORTH.SCR. In FORTH, a "screen" consists of sixteen lines (numbered from 0 to 15) each consisting of 64 characters. Now 16 times 64 equals 1024, which is the exact number of characters (bytes) for a 1K block in a CP/M file. Very efficient storage, but it makes

FORTH screen files unreadable by "standard" text editors and word processors. The CR/LF characters which text editors, and many word processors, expect at the end of a line are not included.

To use FORTH effectively, you have no choice but to learn to use the internal editor supplied with the FORTH system you are using. FORTH+ has a rudimentary editor. Type 6<sp>LIST<cr>. This will display screen 6 which outlines the editor commands. My copy has a typographical error in line 4, but the correction is obvious. A copy of this screen will be essential.

If you don't have a printer, take the time to make a copy of this display. If you have a printer, turn it on, and then type LPT<cr>.

FORTH+ will invite you to press <CTRL-P> which is the standard CP/M+ toggle for printer echo of screen output; having done this, again type 6<sp>LIST<cr>. Screen 6 will be printed for future reference. To de-activate printer echo, again type LPT<cr> and enter <CTRL-P> as prompted. It is now safe to turn the printer off and remove your copy of screen 6.

Let's explore the screen file further; type 0 (that's zero) followed by <sp>LIST<cr>. You should be looking at a "blank" screen with lines numbered from 0 to 15. LEAVE IT THIS WAY! Trying to use screen zero is an invitation to disaster (i.e., a system crash). Type N<cr>. Screen one (which you have seen before) will be displayed. Continue typing N<cr> and reading what is displayed until you get an empty screen. This should be screen 7, which is the first screen you can use to save your own FORTH "definitions." Make a note of this screen number for future use.

While browsing through the screens you should have noticed that screen 2 contained a stack dump routine called S. (pronounced S-dot). The stack is the area where FORTH stores most of the numerical values used for processing. Type 2<sp>LOAD<cr>. Wait for the OK prompt. FORTH+ has added this

new word to its standard "vocabulary." Type XXX<cr>. You will receive a message which says that XXX is undefined; this is the usual way of making FORTH clear the stack of any accumulated "garbage."

Now type S.<cr>. You should receive a message saying that the stack is empty. Put a number on the stack by typing 23<cr>. Check that the number is really on the stack by typing S.<cr>. You will see the number displayed first in hexadecimal and then in decimal notation. Now put a negative number on the stack by typing -456<cr>. Check the contents of the stack by typing S.<cr>. The first line printed will look wrong, while the second line will be a repeat of the 23 entry (since we did not clear the stack).

Forth permits both signed and unsigned integers, and the stack dump we have loaded considers all integers to be unsigned. Thus, the first line printed shows the unsigned equivalent of our signed number -456. Note that the last number entered is on the "top" of the stack, while the previous entry (23) has been pushed down one position. This is an example of an LIFO (Last In First Out) stack which is very common in computer processing.

To check the LIFO operation, type a dot and press RETURN; the number -456 will be printed. Type S.<cr>; the stack now only contains the entry for 23. Type a dot and press RETURN; the number 23 will be printed. What should be true about the stack now? Check by typing S.<cr>.

Exit from FORTH+ by typing BYE<cr>. Want to know more about FORTH? There is only one way to go - buy or borrow Leo Brodie's book "Starting FORTH." If you are buying, insist on the second edition. Apart from the section on the editor in Chapter 3, you should be able to work through Chapters 1 to 6 without too much difficulty. When you try the examples you will find that FORTH+ always starts a new line for its output, so where the book shows:

```
42 EMIT<RETURN> *OK
```

FORTH+ will give

```
42 EMIT
```

```
*OK
```

A few of the FORTH words presented in the book are not included in FORTH+; you will get the 'is not defined' message when you try to use these words. For now just ignore these examples. Don't bother with the stack dumps given in the book because as you have already seen, FORTH+ has its own dump saved in screen 2. Of course you have to load it with 2<sp>LOAD<cr> each time you start FORTH+.

Next month I will try to explain how to use the inbuilt editor, but for those of you who can't wait, a few words of advice and caution. You must tell FORTH+ that you want to use the editor by typing EDITOR<cr>, and you must tell FORTH+ when you have finished using the editor by typing FORTH<cr>. The book suggests trying screen (block) number 180 - DON'T!! Such a large number exceeds your disc capacity.

Use screen number 9 or 10 for your experiments. Before trying the editor, use PIP to make at least one backup copy of the original screen file. If FORTH+ reports an error while you are using the editor, the screen you were editing is no longer in memory; instead, screen 4 or 5 will be there. You will have to relist your screen before you can continue.

Frequent use of the L command is recommended to ensure that you are working on the correct screen. The FLUSH command is a bit suspect; to ensure that your edits are saved, type 6<sp>LIST<cr> before leaving the editor. Even then, they may not be on the disc, but just contained in a CP/M buffer.

Use BYE<cr> to exit from FORTH+ and properly update the disc copy of your screen file.

INTO Z80 & DVORAK

There's enough here to keep you occupied for months, as Joseph Elkhorne looks at chips, keyboards, programming and more!

Although I have stressed learning to use the tools that are supplied with the computer, I will comment now on Public Domain Disc #609, the Z80 Programmer.

The CP/M operating system was developed on the Intel 8080. Released in 1973, this chip was the first powerful enough to find application in a microcomputer. Later microprocessors, the Z-80 and the 8085, retained compatibility with their ancestor, though they offer more facilities. Originally, 8" drives conforming to the IBM 3740 standard were used. Later progress led to different sizes and different formats and increased storage capability - at the cost of non-interchangeability.

Disc #609 is an inexpensive way for the experienced assembly language programmer to access the more powerful Z-80 instruction set. This means faster and more compact programs. There are 13 .DOC files included, and you will need to spend a fair bit of time printing and reading these. My approach is to print all documentation on punched, reinforced paper and keep it in a ring binder with additional notes of work in progress.

Z80ASM is an assembler using Zilog mnemonics. The user creates a source file with ED or a word processor. This file MUST have the .ZSM extension. Instructions can be either upper or lower case and the program is not column orientated, with the exception that labels must start at the beginning of a line. Mnemonics (definition, designed to aid the memory) are terms more meaningful to a human being than a series of numbers or binary patterns. Thus, 42 (hex) means MOV B,D to an 8080 and LD B,D to a Z-80. The equivalent in BASIC for this command would be (LET) B = D.

A comment in NOTES.DOC says the assembler is field sensitive, so neat columns are advised. I have not tested this - there are enough things to go wrong, without going out of your way looking for them!

The completed source is processed by Z80ASM and produces .HEX and .PRN files, both as options. This allows you to do a trial run without cluttering up the

disc with bad files. Errors in that case are sent to the screen only. A .HEX file can be uploaded via modem to another user or a bulletin board, or can be inspected and run using DDT or SID.

If your trial run goes as smoothly as mine, you will write your source file, assemble it, and do a TYPE filename.PRN, to find that it closes with a report of 00 ERRORS. The HEXCOM.COM from your CP/M disc will convert it to a working .COM file. You can use SID to examine the .HEX file, if you wish, but you will find it is confused by Z-80 specific instructions, like relative jumps. Nonetheless, it will display a good deal of the code and interpret it correctly.

SID examines code in terms of Intel instructions, even though your test program is written as Zilog ones. Although SID might exclaim, "What is this?", the Z-80 merely acts on the bytes it fetches from memory when it executes the program. A further program on the public domain disc offers some assistance in the Z-80 realm. Z80DEBUG features up to five memory traps, quick tracing of 1 to "many" instructions, and other functions. It is not as versatile as SID, in that it does not offer symbolic instruction debugging.

Other useful programs on #609 are LASM, which will assemble a series of separate files; MLOAD allows programs which load at an address other than standard CP/M programs use; RASMB, reverse assembles .HEX files; UNLOAD decodes a .COM file into ASCII format of hex codes; and Z80-to-8080 and 8080-to-Z80 conversion utilities.

Presumably, MLOAD will let you develop a machine code program in the CP/M environment which is accessible from BASIC. This is not possible with the "normal" CP/M approach. In version 2.2, you assemble a source with ASM, then LOAD the .HEX result - and this uses the fixed Transient Program Area (TPA) start address of 0100h, always.

As your BASIC programs load at address 368 of RAM, and lower RAM is used by the system, diabolical things would happen in overlaying machine code there.

RASMB offers you the opportunity to hack object code, when you have no source files. Reverse assembly, or disassembly, can be a painful process; this utility breaks down the code into a listing which includes labels. The resulting .DIS file can be edited and re-assembled.

You'd first pass the .COM file through UNLOAD to render a .HEX file or processing by RASMB. The latter will also produce a .PRN file for your assistance. Also on the disc are ZMAC, a re-locating Z-80 assembler, and ZLINK, for editing programs assembled by ZMAC. Finally, there is RESOURCE, an 8080 disassembler (to re-source, geddit?) by Ward Christiansen, with a large .DOC file.

Overall, you will find hours of study necessary to utilise the tools on this disc. You will also find annoyance at references in the documentation to other files not available. This is not unusual with Public Domain

programs, no matter its origin. What has been provided, however, is worthwhile.

HANDY HINT DEPT.

If you don't like the format you find on a .DOC file, use your word processor to arrange it to your taste. If the original file has been prepared with ED or similar, you'll see a lot of Tab character symbols in Tasword, for example.

To avoid painful work, expand these to spaces when you are in CP/M using the T option of PIP.

```
PIP newname=oldname[T8
```

is the way to solve that little problem.

And now, on to other matters.

DVORAK VS QWERTY VS ...

Have you ever wondered why the typewriter/computer keyboard is the way it is? The answer is historical. In the 19th century, during the development of the mechanical typewriter, a number of layouts were tried.

Inventors soon discovered a linear approach was very poor. Using all the fingers with a minimum of movement seemed preferable. All too soon, they found a good typist could literally wreck their state-of-the-art machines. The "Qwerty" keyboard was deliberately laid out to slow the operator down. A hundred years later, we're still using a device designed to be inefficient! Not to mention the problems which have surfaced under the label of RSI.

Well, a bloke named Dvorak investigated this whole area in the 1930's. "Typewriting Behaviour" by Dvorak and Associates was published in 1936. A further reference is "There is A Better Keyboard" in the Business Education Review, 1943.

I'm indebted to Mr. Andrew Gordon, a student of experimental psychology, for these references. He further provided a few of the rules of thumb that Dvorak developed:

- Avoid one finger doing both letters of a common digraph, that term referring to a two-letter sequence.
- Avoid common digrams with both letters on the one hand.
- Keep as much movement on the home row as possible.
- Don't have common words fully written by one hand.
- The right hand is generally stronger, so the Dvorak layout uses it about 63% whereas qwerty only about 40%.

Of course, no ideal layout can possibly exist. And what works for English may not be viable in another language. But letter frequency in English is

etaoin shrdlu

so you can see how the left hand has its work cut out for it. Re-training a touch typist to the Dvorak layout is said to take about three weeks and gives an average 30% increase in speed and accuracy.

Here is the essential Dvorak layout:

```
? . p y f g c r l
a o e u i d h t n s
; j k x b m v w z
```

and you'll see straight away that the most frequent letters, the "e" and the "t" are the new home keys.

When I received this information via The Witches Brew BBS, I immediately wrote a short BASIC program to give it a go. Although I've hung back from changing over, I could see the advantages after only a couple of minutes of testing the layout.

```
1 ' Dvorak keyboard configuration
2 ' for Amstrad CPC 6128
3 ' J.L. Elkhorne - May 1989
9 :
10 REM top row
100 REM top row
110 KEY DEF 67,1,&3F
120 KEY DEF 59,1,&2C
130 KEY DEF 58,1,&2E
140 KEY DEF 50,1,&70
150 KEY DEF 51,1,&79
160 KEY DEF 43,1,&66
170 KEY DEF 42,1,&67
180 KEY DEF 35,1,&63
190 KEY DEF 34,1,&72
200 KEY DEF 27,1,&6C
299 :
300 REM middle row
310 ' a remains same
320 KEY DEF 60,1,&6F
330 KEY DEF 61,1,&65
340 KEY DEF 53,1,&75
350 KEY DEF 52,1,&69
360 KEY DEF 44,1,&64
370 KEY DEF 45,1,&68
380 KEY DEF 37,1,&74
390 KEY DEF 36,1,&6E
400 KEY DEF 29,1,&73
499 :
500 REM bottom row
510 KEY DEF 71,1,&3B
520 KEY DEF 63,1,&71
530 KEY DEF 62,1,&6A
540 KEY DEF 55,1,&6B
550 KEY DEF 54,1,&78
560 KEY DEF 46,1,&62
570 KEY DEF 38,1,&6D
580 KEY DEF 39,1,&76
590 KEY DEF 31,1,&77
600 KEY DEF 30,1,&7A
699 :
700 CLS:PRINT"Your keyboard lower case keys"
710 PRINT:PRINT,"are now Dvorak style!!!"
```


SETTING OUR SIGHTS ON SID

Let us return to fundamentals and talk about SID for a bit. The Symbolic Instruction Debugger of CP/M Plus is an update of the DDT program in earlier releases.

You use it to inspect, test and alter assembly language programs. If you try to type a .COM file, you get gibberish on the screen; the bytes mean nothing to the display, unless they are imbedded valid ASCII characters. If you have the .HEX file, you can TYPE it, and get a bunch of ASCII characters, which will also mean little to you.

Therefore SID is used to call a machine code program into memory, and break it down into its component instructions in a more human-readable form. Let's see a small SID work session.

```
CP/M 3 SID - Version 3.0
#d100
0100: 01 09 1A C3 99 01 00 00 00 00 00 00 00 00 00 00 .....
0110: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0120: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0130: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0140: 43 50 2F 4D 20 56 65 72 73 69 6F 6E 20 33 2E CP/M Version 3.0
0150: 43 4F 50 59 52 49 47 48 54 20 31 39 38 32 2C COPYRIGHT 1982,
0160: 44 49 47 49 54 41 4C 20 52 45 53 45 41 52 43 48 DIGITAL RESEARCH
0170: 31 35 31 32 38 32 00 00 00 01 36 35 34 33 32 31 151282...654321
0180: 43 50 2F 4D 20 33 2E 30 24 31 00 02 C5 C5 11 80 CP/M 3 SID - Ver
0190: 73 69 6F 6E 20 33 2E 30 24 31 00 02 C5 C5 11 80 sion 3.0$1.....
01A0: 01 0E 09 CD 05 00 C1 21 07 00 7E 3D 90 57 1E 00 .....!..~=.W..
01B0: D5 21 00 02 78 B1 CA C1 01 0B 7E 12 13 23 C3 B4 !..x.....~.#.
#rcharaset.com
NEXT MSZE PC END
0180 0180 0100 D2FF
#d100
0100: 3E 1F 3C 5F 0E 02 CD 05 00 F1 FE 7F C2 02 01 >.<.....
0110: 0E 0B CD 05 00 B7 CA 00 01 C9 00 00 00 00 00 00 .....
0120: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0130: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0140: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0150: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0160: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0170: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0180: 43 50 2F 4D 20 33 2E 30 24 31 00 02 C5 C5 11 80 CP/M 3 SID - Ver
0190: 73 69 6F 6E 20 33 2E 30 24 31 00 02 C5 C5 11 80 sion 3.0$1.....
01A0: 01 0E 09 CD 05 00 C1 21 07 00 7E 3D 90 57 1E 00 .....!..~=.W..
01B0: D5 21 00 02 78 B1 CA C1 01 0B 7E 12 13 23 C3 B4 !..x.....~.#.
#i100
0100 MVI A,1F
0102 INR A
0103 MOV E,A
0104 PUSH PSW
0105 MVI C,02
0107 CALL 0005
010A POP PSW
010B CPI 7F
010D JNZ 0102
0110 MVI C,0B
0112 CALL 0005
#j
0115 ORA A
0116 JZ 0100
0119 RET
011A NOP
011B NOP
011C NOP
```

```
011D NOP
011E NOP
011F NOP
0120 NOP
0121 NOP
#f130,180,42
#d100
0100: 3E 1F 3C 5F 0E 02 CD 05 00 F1 FE 7F C2 02 01 >.<.....
0110: 0E 0B CD 05 00 B7 CA 00 01 C9 00 00 00 00 00 00 .....
0120: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0130: 42 42 42 42 42 42 42 42 42 42 42 42 42 42 42 BBBBBBBBBBBBBBBB
0140: 42 42 42 42 42 42 42 42 42 42 42 42 42 42 42 BBBBBBBBBBBBBBBB
0150: 42 42 42 42 42 42 42 42 42 42 42 42 42 42 42 BBBBBBBBBBBBBBBB
0160: 42 42 42 42 42 42 42 42 42 42 42 42 42 42 42 BBBBBBBBBBBBBBBB
0170: 42 42 42 42 42 42 42 42 42 42 42 42 42 42 42 BBBBBBBBBBBBBBBB
0180: 42 50 2F 4D 20 33 2E 30 24 31 00 02 C5 C5 11 80 BP/M 3 SID - Ver
0190: 73 69 6F 6E 20 33 2E 30 24 31 00 02 C5 C5 11 80 sion 3.0$1.....
01A0: 01 0E 09 CD 05 00 C1 21 07 00 7E 3D 90 57 1E 00 .....!..~=.W..
01B0: D5 21 00 02 78 B1 CA C1 01 0B 7E 12 13 23 C3 B4 !..x.....~.#.
#s130
0130 42 31
0131 42 32
0132 42 33
0133 42 34
0134 42 35
0135 42 36
0136 42 37
0137 42 38
0138 42 39
0139 42 30
013A 42 20
013B 42 .
#d100
0100: 3E 1F 3C 5F 0E 02 CD 05 00 F1 FE 7F C2 02 01 >.<.....
0110: 0E 0B CD 05 00 B7 CA 00 01 C9 00 00 00 00 00 00 .....
0120: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
0130: 31 32 33 34 35 36 37 38 39 30 20 42 42 42 42 42 1234567890 BBBBBB
0140: 42 42 42 42 42 42 42 42 42 42 42 42 42 42 42 BBBBBBBBBBBBBBBB
0150: 42 42 42 42 42 42 42 42 42 42 42 42 42 42 42 BBBBBBBBBBBBBBBB
0160: 42 42 42 42 42 42 42 42 42 42 42 42 42 42 42 BBBBBBBBBBBBBBBB
0170: 42 42 42 42 42 42 42 42 42 42 42 42 42 42 42 BBBBBBBBBBBBBBBB
0180: 42 50 2F 4D 20 33 2E 30 24 31 00 02 C5 C5 11 80 BP/M 3 SID - Ver
0190: 73 69 6F 6E 20 33 2E 30 24 31 00 02 C5 C5 11 80 sion 3.0$1.....
01A0: 01 0E 09 CD 05 00 C1 21 07 00 7E 3D 90 57 1E 00 .....!..~=.W..
01B0: D5 21 00 02 78 B1 CA C1 01 0B 7E 12 13 23 C3 B4 !..x.....~.#.
#a120
0120 mvi a,42
0122 mov b,a
j123 mov c,a
0124 mov d,a
0125 mov e,d
0126 lxi h,1234
0129 nop
012A rst 6
012B .
#x
----- A=00 B=0000 D=0000 H=0000 S=0100 P=0100 MVI A,1F
#g120,12a
#012A
#x
----- A=42 B=4242 D=4242 H=1234 S=0100 P=012A RST 06
# Ctrl-C exits ...
```

I used the PUT command to make a file of the activity, before I summoned SID. The console then told you SID was ready. We use the d command to display

one record (128 decimal bytes — the smallest disc chunk CP/M can handle). The left hand column is address, middle are the rows of bytes currently in memory, and right is an ASCII representation of those bytes.

Next, we use the `r` command to read in another file. In this case, it is the little program from my August column:

```

; program charaset -- to generate the
; ASCII character set on screen until
; a key is pressed - 27 May 1987
;
bdos equ 05h ; CP/M system caller
conout equ 02h ; print a character from 'e' reg.
cstat equ 0bh ; get console (keyboard) status
;
org 100h ; starting address
start: mvi a,1fh ; initial value
inloop: inr a ; becomes 'space'
mov e,a ; move value for system to use
push psf ; save accumulator value
mvi c,conout ; system call
call bdos ; the hook
pop psf ; retrieve accumulator
cpi 7fh ; compare to 'delete' character
jnz inloop ; do more if not done
;
mvi c,cstat ; look for console (keyboard) call
call bdos
ora a ; logical instruction to
; operate on flags
jz start ; go to beginning if
; no key pressed

ret
end

```

Now, you get a report telling you how big it is. We

again display the first TPA block and indeed, the data have changed. Part of SID has relocated to make just enough room for the user program to be loaded.

The `l` command lists the instruction mnemonics corresponding to the actual bytes. Now we use the `f` command to fill a small block and again `d(isplay)` to prove we have written new information into the memory past our program. Even though 128 bytes was read in, only a portion of that is actually CHARASET.COM.

We now try the `s` command to "set" bytes" in memory, one at a time. Note the full stop terminates this command. Merely hitting RETURN steps on to the next location without changing an existing value.

Getting adventurous, we use the `a` command to "assemble" a few instructions, ending with a full stop.

The `x` command "examines" the current state of the Z-80 microprocessor. Now, we do a `g` command to execute this little bit of code, an `x` to check the new values are actually there, to prove the routine did something.

Note especially that the final command was a RST 6. In most CP/M textbooks, RST 7 is referred to as the instruction to return control to SID (or DDT). It's like a STOP or END instruction in BASIC. And like all languages, there are dialects. Amstrad have decided they need to use the RST 7, so you, the programmer must use the RST 6. Remember this if you are trying examples from CP/M texts.

I don't know if your head aches yet, but mine does. I reckon there's enough food for thought here to feast on until next month. If there are any problems you need help with, or specific topics you want data on, let us know.

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PAPER TYPES

With LocoScript, you're free to print on virtually any size of paper because you can describe the physical characteristics of the paper to LocoScript. In this article we explain what happens when you print documents set up for different Paper Types.

The purpose of this article is to assist LocoScript users who need to use various types of paper by explaining the use of Paper Types. Principally, what's crucial here is that you actually print on the paper LocoScript thinks you're using; you run into all sorts of problems if you use some other type of paper. As you'll see, these problems are easily avoided by using the right Paper Type for the paper.

To begin with, however, we look at what goes into a Paper Type and how LocoScript uses the information to print your documents correctly.

WHAT'S IN A PAPER TYPE?

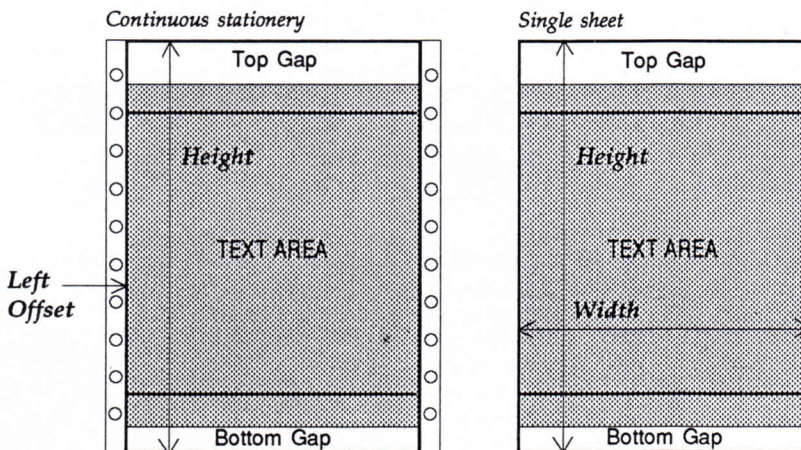
SINGLE SHEET OR CONTINUOUS
Single sheet paper and continuous

stationery before continuing.

With continuous paper the sheets are attached to each other and the paper is fed continuously through the printer. If you select continuous stationery LocoScript knows that when it reaches the end of one sheet it can simply move to the top of the next sheet automatically and continue printing.

THE TEXT AREA

The settings in the Paper Type affect your document in two ways. Firstly the name lets you pick out the Paper Type you want to use for your document. Secondly, the Paper Type fixes the size of the Text area. The Text area is the number of lines allowed for text on each page and is



stationery are handled very differently by the printer so LocoScript needs to know which type you're using. With single sheet paper, LocoScript feeds out each sheet at the end of the page and waits for you to put in the next sheet

equivalent to the Height less the sum of the Top and Bottom Gaps.

The Text area is sub-divided into three parts: the Header Zone, the Footer Zone and the Page Body.

THE TOP AND BOTTOM GAPS

The Top and Bottom Gaps are the areas of the paper where you can't print text. On single sheet paper, the gaps are necessary because of the way the printer handles the paper. In order to grip the paper properly, the printer feeds in the paper an inch past the printhead so the Top Gap must be at least 6.

LEFT OFFSET

On continuous stationery, the start position of the printhead may not always be where you want to start printing. There may be a gap between the edge of the paper and the printhead's normal start position because of the way the paper holders are positioned. Or you may simply want to start printing at a different position, for example on labels stationery. The Left Offset lets you bridge any gap by increasing in tenths of an inch the distance from the printhead's normal start position to the position on the paper where you want to start printing. Similarly the last half inch of the paper can't be used for text as the printer can't hold the paper firmly enough to ensure that the text is printed straight. So the Bottom Gap should be a minimum of 3. You can increase the size of the gaps, for example, to move the printhead past a printed letter heading.

WIDTH ON SINGLE SHEET PAPER

In LocoScript you can print on single sheet paper in one of two ways. You can either use the paper upright (known as 'portrait') or you can turn the paper on its side (known as 'landscape'). The Width setting on single sheet paper lets you measure the height of the paper when it's turned on its side. It has been included to let you use the paper sideways without having to set up an alternative Paper Type just for this purpose. You calculate the Width in exactly the same way as the height: inches across x 6=width. On continuous stationery, the problem with paper handling doesn't occur. Here the Top and Bottom Gaps settings ensure that

you don't print on the perforations between the pages. All you have to do is position the paper so that the printhead is at the top of the page when you start printing.

THE HEIGHT

The Height setting is the length of the page in terms of the number of lines. LocoScript measures the page size in a pitch of 6 lines to the inch. So the height is simply the length in inches multiplied by 6. For example, 11 inch continuous stationery has 66 lines to the page (11x6=66) and A4 single sheet has 70 lines (112/3x6=70).

If you don't plan on using the paper sideways you can ignore the Width setting.

Don't confuse the Width setting with using the width of the paper when it's upright! LocoScript doesn't make any decisions about the position of the right hand margin for you - it's up to you to set the margins to fit in with the Paper Type you're using.

There is no Width setting for continuous stationery as you can't turn this type of paper on its side in the printer!

Each Paper Type is a set of details about a particular type of paper. It records, for example whether the paper is supplied as single sheets or as continuous stationery, the length of each sheet, and how much of a gap there must be at the top and the bottom of each page.

The information in the Paper Type allows LocoScript to work out how far to feed each sheet of paper through the printer as it prints your document. LocoScript itself can't 'see' the paper. Instead, it needs to be told, for example, whether the paper is single sheet or continuous so that it knows either to feed out each single sheet fully or to move to the top of the next sheet of continuous paper. To get to the right place at the top of the next sheet, it has to be told how long each sheet of paper is. Think of LocoScript as a blind person feeling down a piece of paper, and you should see the

PRINTING ON THE 'CURRENT' PAPER

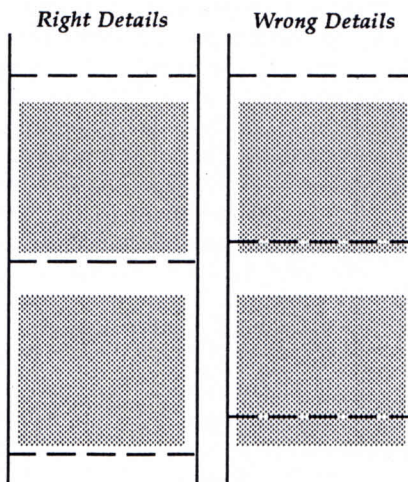
If you print on a different type of paper to the one the document was intended for, the number of lines allowed for the Text area (see the section on What's in a Paper Type) in the two Paper Types may not match.

- If they do match, there won't be any difference in the way the document is printed.
- Printing on paper where the Text area is longer than the Text area in each page of your document, simply means that some lines of the paper are wasted.
- If you print on paper where the Text area is shorter than the Text area in the paper your document was intended for, it won't always be possible to fit all the text in your document's page onto a single sheet of paper. If there's too much text on a page for one sheet, LocoScript will print the rest of the page on a second sheet or more sheets if necessary. Each new page of your document is still printed on a new sheet of paper, so you could easily get a pattern of pages where the text area is fully used on one page but only partly used on the next. However this pattern won't necessarily be regular because if the page is sufficiently short to get on one sheet of paper, this is all LocoScript will use.

If you look at the details of the A4 and 11" continuous Paper Types on the LocoScript disc, you'll notice that the Text areas are the same in both types of paper. This is not a coincidence! The gaps for 11" continuous have been set up so that you will get identical draft and final versions of a document printed on 11" continuous and A4 single sheet respectively.

problems it has! As you might guess, it's important that LocoScript knows the correct details for paper you're currently using. If LocoScript thinks that the paper is longer than it actually is, then it can happily carry on printing totally unaware that your text is being printed on the platen. Similarly, if it thinks you are using

single sheet stationery when you are actually using continuous, then it will sit there waiting for paper even though there's plenty in the printer. Telling LocoScript that you are using a different type of continuous (for example A4 instead of 11"), may give you the right result on the first page but from then on, the text will gradually slide either up or down



These diagrams illustrate what happens when you give LocoScript the wrong Paper Type details. On the left, LocoScript has the correct details for the paper and the text (represented by the shading) is correctly positioned on the page. On the right, LocoScript has been misled over the length of the page and the text is printed over the perforations.

LocoScript's warning message

Document and current printer do not match
Paper types differ

Current is: 11continuous Continuous
Intended: A4 Portrait

Use the current paper

▶ Change to paper intended for document
Cancel operation

SETTING UP A NEW PAPER TYPE

The following steps set up a Paper Type for A4 continuous stationery by working from a Paper Type that you already have - the one for A4 single sheet stationery.

- Display the Disc Manager Screen and then press f6 to display the settings menu. When the menu appears, move the cursor to Paper Types (NOT *New Paper Type*) and press ENTER. This displays a list of the Paper Types you already have.
- Move the cursor to the Paper Type you are going to work from - A4 in this case - and press ENTER again. You now see a menu containing the details of the Paper Type you picked out: this is the menu to use to set the new details. Simply work down the menu changing those details that need to be changed but leaving the rest unchanged.

Don't forget to change the name!

For our A4 continuous stationery, all we need to do is:

- change the name to A4 continuous (press - and then type the new name)
- move the cursor to *Continuous stationery* and press + to select this, and
- move the cursor to Ignore Paper Sensor and press - to clear this selection. (As the paper is continuous, you will want the Paper Sensor to warn you when you are coming to the end of your paper)

- When you are ready, select *Create New Paper Type*, press ENTER. This takes you back to the list of Paper Types, with the new name added. Press EXIT then ENTER to return to the Settings menu and then EXIT then ENTER again to leave the Settings menu. Save the new Settings file on your Start-of-day disc.

Paper: A4continuous	
Single sheet	
✓ Continuous stationery	
Height	70
Left offset	0
Top gap	6
Bottom gap	3
Ignore paper sensor	
Set new details	
▶ Create new Paper Type	
Remove Paper Type	

the page.

If you use A4 single sheet for all your documents, making sure that LocoScript has the correct details is no problem: it's the type of paper that LocoScript is set up to expect by default. But the chances are that you'll want to chop and change the paper you use. What is more, you won't always want to use the same type of paper even to print the same document: for example, you might want to print the final version of a document on single sheet but for convenience's sake you may prefer to produce draft versions on continuous stationery.

You have to set up LocoScript just once with the right information about your paper and then, LocoScript's system of Paper Types actually looks after you and stops you from getting it wrong - providing you never mislead it.

THE PAPER TYPE SYSTEM

Each LocoScript document records the Paper Type that you intend to use for the final version in its Document Set-up. This is called the 'Intended' Paper Type and it is used by LocoScript to work out where to break the pages in the document.

As well as recording the Paper Types you intend to use, LocoScript also keeps a record of the type of paper it believes you are currently using in the printer. This is known as the 'Current' Paper Type and it is this that has to describe the actual paper that you are using if your documents are to be printed correctly.

Immediately after you load LocoScript the Current Paper Type is the Default Paper Type recorded in your Settings file. So if you tend to use one type of paper more than any other, select it as the Default Paper Type: then LocoScript will

automatically set up the printer for this Paper Type whenever you start up.

If you change the paper in the printer, you have got to update the Current Paper Type, otherwise your document might not print correctly. You can do this by using the f3 Paper menu in the Printer Control State.

But if the paper you want to use is the one recorded in the document, LocoScript can update the Current Paper Type for you. The way it does this is as follows:

LocoScript always compares the Current Paper Type with the Intended Paper Type recorded in the document before starting to print. If they match, then it assumes that you are wishing to continue using the same paper and simply prints the document. If they don't match, it stops and asks you which type of paper you want to use.

At this point, you have a choice of action:

- **Use the current paper** i.e. the type of paper described by the Current Paper Type. This means carrying on using the paper already in the printer.

- **Use the intended paper** i.e. the type of paper recorded in the Document Set-up. To do this, you have to put this type of paper in the printer and then select the option 'Change to paper intended for document.' LocoScript then automatically updates the Current Paper Type for you, so that you don't have to stop what you're doing to update the Current Paper Type by hand using the f3 Paper menu in Printer Control State.

- **Cancel the operation.** As always in LocoScript, you have the option to abandon what you're doing. You should also take this option if you don't want to print on either the current or the intended paper but on some other type of paper. Then you have to update the Current Paper Type using the f3 Paper menu in Printer Control State.

By comparing the Paper Types in this way, LocoScript ensures that you only ever choose to print on

either the Current Paper or on the Intended Paper - and if you choose the Intended Paper, it then makes sure that this immediately becomes the Current Paper. As a result, the Current Paper Type should always describe the paper you are about to use - provided you never lie to LocoScript about what you actually did.

The only problem with this scheme is knowing what Current Paper Type LocoScript starts with. As we said earlier, this is the Default Paper Type recorded in the Settings file. Just in case this isn't the paper in the printer when you first print, LocoScript gives you an 'About to print' message - regardless of whether the Current and Intended Paper Types match. Among other things this tells you the type of paper LocoScript is expecting so that you have a chance to change the paper before proceeding.

HAVING THE RIGHT PAPER TYPES

The Paper Type Scheme we've described relies on honesty, but it also relies on you having the description of each type of paper you use stored as a Paper Type.

On the LocoScript master disc we set up three Paper Types for the

most commonly used types of paper-A4 single sheet, A5 single sheet and 11" continuous, but this doesn't mean you're limited to using these Paper Types and these types of paper. To handle other types of paper, you simply need to set up your own Paper Types. The worked example on the previous page shows you how to set up a Paper Type for A4 continuous stationery.

The important thing about creating a new Paper Type is to get the measurements right. For example, it is essential to measure the length of your paper as accurately as possible, particularly when using continuous stationery: otherwise the position of the text on the page will gradually move either up or down the page. In fact, you won't always be able to get the Height setting spot on because you have to give it as the nearest whole number after you measured the page in inches and multiplied by 6, but the error should be very small. (Any error you get is less important for single sheet paper. Here LocoScript feeds out each sheet fully so it doesn't matter if the Height setting you calculated is slightly less or greater than a whole number).

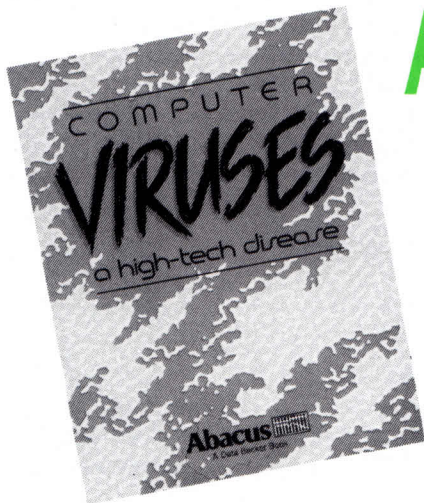
A useful tip is to work from the

Paper Type which most closely resembles the one you want to create. For example, to create a Paper Type for A4 continuous stationery, you can use A4 single sheet as the model and then you won't have to alter the Height or the Top and Bottom Gaps. All you will have to do is change the name of the Paper Type and the type of stationery, and clear the 'Ignore Paper Sensor' setting.

We show you how to do this in the worked example.

THE BOTTOM LINE!

As with many LocoScript's features, the key to using Paper Types is to set up LocoScript with the information it needs to do all the work for you. This may take some time and thought in the beginning but afterwards you'll never need to think about it again. If you set up a template with the Paper Type you require, then all the documents you create using the template will automatically use this Paper Type. In the absence of a template, any documents you create will use the Default Paper Type for the Standard printer currently selected in the f6 Settings menu.



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AGAIN & AGAIN &...

Silly titles aside, recursion is a powerful and important programming concept, says Petr Lukes

Recursion is a powerful programming concept, an understanding of which does not come intuitively, particularly to programmers in BASIC. It is a repetition construct which can be converted into iteration (looping), but often at the cost of extra coding which can obscure the processing flow.

It is a process where the same sequence of program statements, structured as a subroutine (GOSUB... RETURN), is called several times: the initial call is from a controlling routine, subsequent calls are made from and return to the recursive routine itself, until all the required processing is finished and the final return is made to the caller. Each pass through the recursive routine creates its own set of local variables which exists only until the current pass is terminated. Although recursion requires extra effort to implement in languages which do not support local variables, it often results in a neater and more compact solution of the problem even after the extra coding required for creating the necessary local structure.

The concepts need to be understood before dealing with examples. The first is that of a stack, which is a very efficient structure for storing temporary data. It is often likened to a plate stacker in a cafeteria: clean plates are placed in a spring-loaded vertical rack, so that the last plate placed in it is always the first to be taken off (a LIFO: last-in, first-out structure). Computer stacks are not spring-loaded and generally grow downwards in memory, and we need to keep a pointer which holds the address of the last item placed on the stack, but that presents no problems. Secondly, it is necessary to understand the sub-routine mechanism, which exists in all languages, under the name PROCEDURE and FUNCTION or similar. When the BASIC interpreter encounters a GOSUB *nnn*, it stores the address of the command on the stack (PUSHes it) and transfers processing to the new address associated with line *nnn*; when it eventually encounters a RETURN, it recovers the address from the stack (POP)s it) and resumes processing at the command immediately following the GOSUB.

Subroutines may be nested (a subroutine may call other subroutines or itself); each RETURN will redirect the execution to the latest caller.

Languages which do support local variables reserve the required space on the stack for them at the time the subroutine is called; simple BASIC does not, and it is left to the programmer to do so (the later generations of BASICs, i.e. the BBC BASIC, and the MS-DOS Quick- and Turbo BASICs, do provide local variables). The hardware stack used by the interpreter is not normally accessible from BASIC, so a software stack must be created and controlled by the programmer. The obvious structure to use is an array, either numeric or string or both, depending on the type of the local variables needed. Simple BASICs do not allow redimensioning of arrays, so the software stack(s) must be established at the beginning of the program, just once, and must be of sufficient size to accommodate the maximum depth of recursion which may occur.

A SIMPLE EXAMPLE : FACTORIALS

It is mandatory to start an explanation of recursion by using the factorial as an example. Factorial of a positive integer *N* is designated as *N!* and defined as the product of integers from one to *N*, i.e. $N! = 1 * 2 * \dots * (N-1) * N$; for example $3! = 1 * 2 * 3 = 6$. It can also be defined recursively as $N! = (N-1)! * N$, i.e. factorial of *N* equals factorial of (*N* minus one) times *N*. Using this definition we produce the sequence $3! = 3 * 2! = 3 * 2 * 1! = 3 * 2 * 1 * 0!$, at which point it becomes obvious that we need some way of stopping the sequence. For reasons connected with computing the number of permutations and combinations (see later), $0!$ is arbitrarily defined as 1. This suggests the stopping condition: when the count-down reaches zero, factorial is set to one and the sequence is finished.

The following is a recursive FACTORIAL function, coded in Pascal and translated into BASIC. It should be immediately obvious that factorials can be computed much more efficiently in a simple FOR...NEXT loop (see next example), however this simple routine is very suitable for demonstrating the process.

The Pascal calling procedure is not shown, but a call would be in the format 'fact := FACTORIAL (3)'. When executed, 'fact' would hold the value 6.

PASCAL LISTING

```
function FACTORIAL (N:real): real;
begin
    if N = 0 then FACTORIAL := 1
    else FACTORIAL := N * FACTORIAL (N-1)
end;
```

As the Pascal version was being compiled, the compiler would have created a storage area referenced by the name 'FACTORIAL', for the function to leave the result; initially this area is not initialized to any particular value. Each call 'FACTORIAL (xx)', from outside or inside the function, will create a local variable 'N' which takes the value 'xx': in our case there will be a sequence

N[1]=3:RETURN[1] (from and to the caller), N[2]=2:RETURN[2], N[3]=1:RETURN [3], N[4]=0:RETURN[4]; at this stage 'FACTORIAL' storage will be initialised to 1, N[4] will disappear and RETURN [4] will be executed. It, as all the others except the first, will point to the statement 'FACTORIAL :=N * FACTORIAL (N-1)'. Here the value stored in 'FACTORIAL' is multiplied by the value in the current copy of 'N' and placed back into 'FACTORIAL', the current copy of 'N' is extinguished and the next RETURN is executed. At the final RETURN[1], all the local copies of 'N' are gone, and the final result is left in 'FACTORIAL'.

All this activity is well hidden from the user by the implicit Pascal structures, but becomes more obvious in the BASIC version, where the structures have to be created explicitly. The local copies of 'N' are represented by the elements of the numeric stack 'SN', accessed by the stack pointer 'SP'. Each 'GOSUB' corresponds to the call 'FACTORIAL (xx)' and established a new stack level; the BASIC 'RETURN' takes the place of the Pascal 'end,' and sends the execution flow to the calculation statement and extinguishes one level of the stack.

BASIC ADAPTION, WITH CALLING MODULE (MAIN)

```
10 PRINT"FACTR : Factorials by Recursion LKS 890515"
20 DIM SN(99)'numeric stack
30 'main
40 INPUT"Enter a number >= 0 : ";F:F=INT(F)'integers only
50 IF F<0 THEN PRINT"Factorial is undefined for negative numbers":GOTO 120
60 '
70 FACT=-99'store for result, initially undefined
80 SP=-1'stack pointer
90 N=F:GOSUB 140'pass value to function and call it
100 '
110 PRINT"Factorial of " F "equals" FACT
120 GOTO 40
130 '''
140 'function fact(n:real): real;
150 'recursive definition : factorial (n)=factorial (n-1)
   *n or n! = (n-1)! * n
160 'local : n : initial value passed by caller
170 IF N=F THEN PRINT"Computing factorial of" N:PRINT"Winding up"'once only
180 IF N > 0 THEN GOTO 230'continue, stop condition not yet reached
190 'else stop condition: 0!=1
200 FACT=1
210 PRINT"Winding down and evaluating"
220 GOTO 310'begin wind-down
230 SP=SP+1:SN(SP)=N'stack current value of n
240 N=N-1'decrement
250 FOR A=0 TO SP:PRINT SN(A);:NEXT A:PRINT'display stack on the way up
```

```
260 GOSUB 140'recurse; RETURNS will execute the following line
270 FOR A=0 TO SP:PRINT SN(A);:NEXT A'display on the way down : stack
280 PRINT" fact=" FACT "*" SN(SP)'
   : evaluation
290 FACT=FACT*SN(SP)'evaluate
300 SP=SP-1'point to next local value of n
310 RETURN
```

A typical display produced by the BASIC version would be:

```
Computing factorial of 3
Winding up
3
3 2
3 2 1
Winding down and evaluating
3 2 1 fact = 1 * 1
3 2 fact = 1 * 2
3 fact = 2 * 3
Factorial of 3 = 6
```

As mentioned, computing factorials recursively is far from the best solution, but the value of the BASIC version lies in its demonstration capability. A few extra PRINT statements inserted at the crucial points of execution may help to clarify any unclear aspects. The routine has no inherent limit of the size of factorials which may be computed (the stack depth is an arbitrary selection), but there are limits imposed on it by the language. The first limit is the maximum magnitude which can be held in a numeric variable not likely to be exceeded due to the second limit. Each active (unreturned) GOSUB uses up a certain amount of the available hardware stack space, usually six bytes. Ultimately this space will be filled up and the program will stop with an 'Out of memory' error message. Nothing can be done about either limit; both are dependent on the implementation of each particular BASIC.

A COMPLICATED EXAMPLE : PERMUTATIONS

Permutations produce all possible orderings of a given number of objects, using each object once in each ordering. The objects may be single letters, and players of Scrabble could find good use for the routine. We will translate a Pascal program, which appeared in R.E. Prather's book *Problem Solving Principles - Programming with Pascal* (Prentice-Hall, 1982). The original has been modified slightly, to indicate the limits of the conditionals. This involves using GOTOs, an anathema to purists, but is inevitable in simple BASICs in which conditionals may not span more than one line.

```
program PERMUTATIONS;
const   N=4;
type    RANK=0..N; RANGE=1..N; ROWTYPE=set of
```



```

RANGE;
var PN: integer; I,K: RANGE; PERMS: array [1..N] of
RANGE;
ROW: ROWTYPE;

procedure SELECT(PAD: ROWTYPE; DN: RANK);
label 1,2,3;
var OBJ: RANGE;

begin {of SELECT}
  for OBJ := 1 to N do
    begin
      if OBJ in PAD then
        {
          if not (OBJ in PAD) then goto 2;}
          begin
            PERMS[DN+1] := OBJ;
            if DN+1 = K then
              {
                if DN+1 < K then goto 3;}
                begin
                  PN := PN+1; write('Perm no.', PN, ' ');
                  for I := 1 to K do write (PERMS[I]);
                end;
                goto 2;
              }
            end;
          3: {recurse}
            SELECT (PAD-[OBJ], DN+1);
          end;
        2: {next OBJ}
          end;
        1: {return}
      end; {of SELECT}

{main}
begin
  ROW := [1..N]; PN := 0; K := 3;
  SELECT(ROW,0);
end. {of PERMUTATIONS}

```

The BASIC translation follows. The structure of the two versions is identical, with the Pascal SETs replaced by strings, which represent a similar data structure. Some early BASICs did not have the MID\$(x\$,a,b)=... statement, so it is simulated by concatenation; the more efficient form is shown as an alternative. It is suggested that you keep the same line numbering; later on some modifications will be suggested, in the form of replacing a few particular lines.

```

10 PRINT"PERMR : Permutations by Recursion LKS 890526"
20 'after R.E. Prather, Problem Solving Principles (with PASCAL), 1982
30 GOTO 420'main is at end, as in PASCAL
40 ''''
50 ''''
60 'procedure select(pad,dn)
70 'global: k, n, pn, sp, tr, sn(), ss$(), row$, perm$, us$

```

```

80 'local: pad$, dn; initial values passed by caller
90 'local: ch$, obj; initialized in procedure
100 FOR OBJ=1 TO N'new loop, for all objects in ROW
110 CH$=MID$(ROW$,OBJ,1)'pick one in position OBJ
120 IF DN=0 THEN PRINT"Group starting with "CH$"new perm
130 IF TR THEN PRINT"level"SP": object no."OBJ["CH$"]
  from ["PAD$"] : ";
140 IF MID$(PAD$,OBJ,1) <> US$ THEN GOTO 170'draw object if not yet drawn
150 IF TR THEN PRINT"not in"
160 GOTO 340'not in current set, pick next one
170 'object is in current set
180 DN=DN+1:PERM$=PERM$+CH$'new draw
190 IF TR THEN PRINT"draw no."DN": "PERM$
200 IF DN < K THEN GOTO 250
210 PN=PN+1:PRINT"Perm no."PN": "PERM$'output finished permutation
220 'MID$(PAD$,OBJ)=US$'replace drawn object by a char not in ROW
230 PAD$=LEFT$(PAD$,OBJ-1)+US$+MID$(PAD$,OBJ+1)'alternate MID$()=
240 GOTO 330'stay at same level
250 'perm not yet done, start next level
260 SN(SP)=OBJ:SS$(SP)=PAD$:SP=SP+1'save current state on stacks first,
270 'MID$(PAD$,OBJ)=US$'now mark drawn object
280 PAD$=LEFT$(PAD$,OBJ-1)+US$+MID$(PAD$,OBJ+1)'alternate MID$()=
290 GOSUB 60'recurse; RETURNS will continue at next line
300 'drop down to previous level
310 IF TR THEN PRINT"loop finished, continuing at level"SP-1"with draw"DN
320 SP=SP-1:PAD$=SS$(SP):OBJ=SN(SP)'restore previous state
330 DN=DN-1:PERM$=LEFT$(PERM$,DN)'cancel latest draw
340 NEXT OBJ
350 '
360 RETURN
370 ''''
380 'subroutine factorial: f0=f1!
390 F0=1:FOR F=1 TO F1:F0=F0*F:NEXT F
400 RETURN
410 ''''
420 'main
430 ROW$="1234"'objects, single character
440 N=LEN(ROW$)'N objects
450 K=3:K=INT(K)'taken K at a time, cannot have fractions
460 PRINT"Permutations of "ROW$,"N"objects taken"K"at a time,"
470 IF K > N OR K < 1 THEN PRINT"cannot take"K"objects

```



```

out of"N:STOP
480 F1=N:GOSUB 380:PN=F0:F1=N-K:GOSUB 380:PN=PN/F0'compute
factorials
490 PRINT"producing"PN"permutations"pn=n!/(n-k)!
500 INPUT"Trace (n/y) ";US$:TR=US$="y"
510 DIM SN(K),SS$(K)'stacks: numeric and string
520 PERM$="":US$="." 'store for permutations, used-object
indicator
530 PAD$=ROW$:DN=0:SP=1:PN=0'starting parameters for pr
cedure
540 IF TR THEN PRINT"Start at level"SP": draw no."DN"fr
om ["PAD$"]"
550 GOSUB 60'call procedure
560 IF TR THEN PRINT"Finish at level"SP": draw no."DN"fr
om ["PAD$"]"
570 STOP'finished

```

The setup may be likened to having the objects arranged in a row in a sequence which does not change during the processing. Copies of the arrangement are made on a number of pads, which are then used for keeping a record of the various steps during the process. As an object is selected, its corresponding position on the current copy of the pad is marked off, but not until a copy of the previous state has been saved if required. The trace option will display each step as it is being performed, and should be easier to follow than a lengthy verbal explanation, particularly on a hard copy.

A run with the original objects will produce the following display (possibly useful for debugging):

```

Group starting with 1
Perm no. 1 : 123
Perm no. 2 : 124
Perm no. 3 : 132
Perm no. 4 : 134
Perm no. 5 : 142
Perm no. 6 : 143
Group starting with 2
Perm no. 7 : 213
Perm no. 8 : 214
Perm no. 9 : 231
Perm no. 10 : 234
Perm no.11: 241
Perm no.12: 243
Group starting with 3
Perm no.13: 312
Perm no.14: 314
Perm no.15: 321
Perm no.16: 324
Perm no.17: 341
Perm no.18: 342
Group starting with 4
Perm no.19: 412
Perm no.20: 413
Perm no.21: 421
Perm no.22: 423

```

```

Perm no.23: 431
Perm no.24: 432

```

The given objects may, of course, be letters as well as numerals, in any order, and may be repeated. A minor modification would be needed to handle words rather than just single characters: store the words in a string array and at each change of level save or restore a complete array. Not difficult, but it would complicate even further an already complex program. A simple modification would allow keyboard input of the objects to be permuted, and the inclusion of a loop to produce all permutations of the objects taken from two to the total number at a time. A point to be noted: permuting letters will inevitably produce a surprising large number of rude words.

Each new procedure establishes a new subroutine frame and a FOR...NEXT loop frame on the hardware stack. A loop frame usually requires 16 bytes, and added to the six bytes used by each subroutine frame, the 22 bytes can quickly overflow the stack on machines which allocate a fixed amount of memory (often only 128 or 256 bytes) to it. It is quite easy to avoid the high overhead of the loop structure by implementing it as a conditional jump, by replacing the following lines:

```

100 OBJ=1
340 OBJ=OBJ+1: IF OBJ <= THEN GOTO 110

```

Finally, it is evident that all the RETURNS, except the last one, direct the execution flow to line 300. This indicates that the new procedures need not be called as subroutines but can be accessed by GOTOS. All we need then to trap the last execution of the loop to allow us to return to the caller, and all this can be achieved by the following replacement lines:

```

290 GOTO 60
350 IF SP > 1 THEN GOTO 300

```

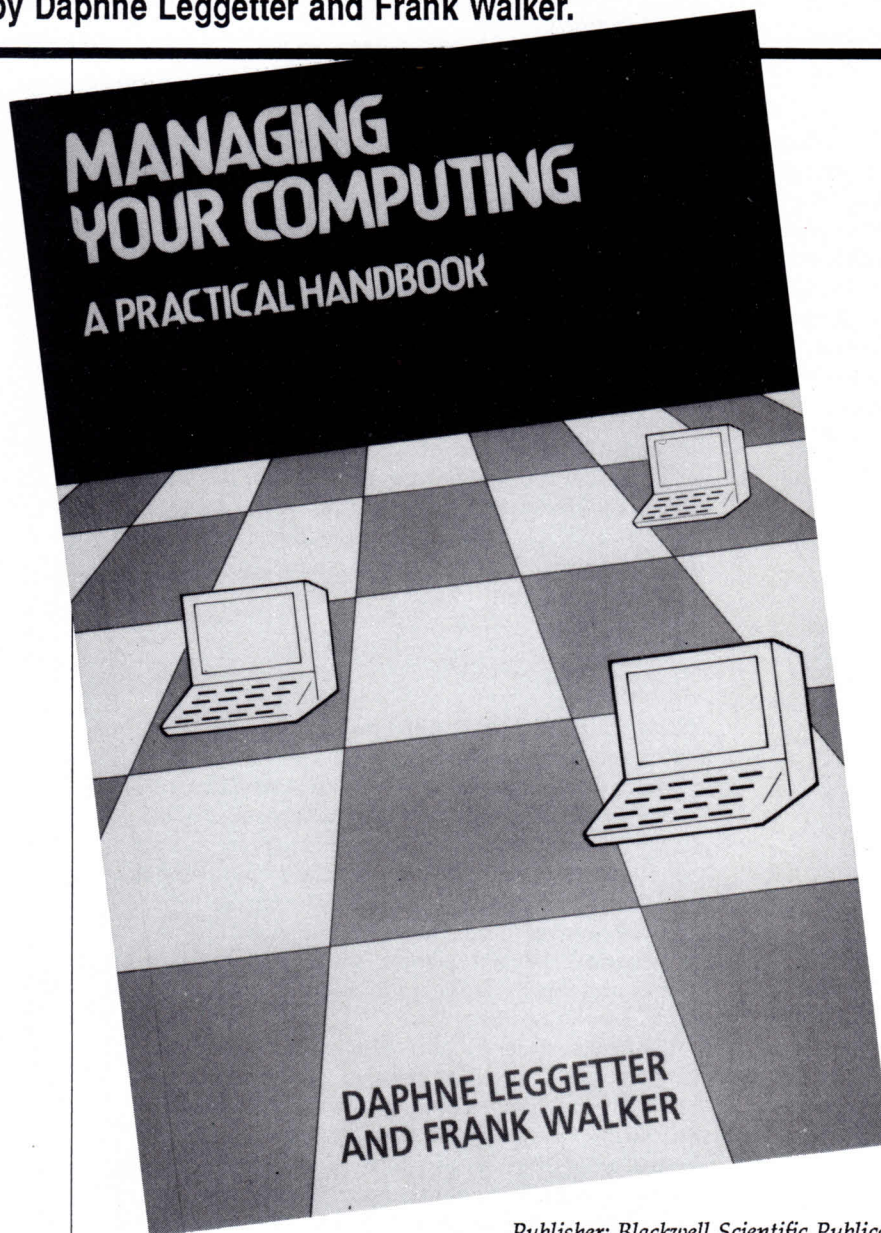
The final RETURN in line 360 could also be replaced, but that is only a minor point.

We have eliminated the avoidable overhead associated with the high-level control structures (GOSUB... RETURN and FOR...NEXT) by reducing them to their primitive equivalents, losing some clarity but using the available memory more efficiently. The factors which limit the number of objects which can be taken at one time are now the total memory, the maximum length of strings, and the largest value which can be held in a real variable (usually $+1.7e+38$).

Languages differ in the level of built-in structures provided for the programmer's convenience, but ultimately they must all reduce the statements and structures to a sequence of bytes, representing the limited set of instructions which can be executed by the microprocessor. It is not necessary to understand fully the process of translation, but some knowledge of it can lead to more efficient programming.

INTELLIGENT COMPUTING

Shane Kelly peruses the pages of "Managing Your Computing" by Daphne Leggetter and Frank Walker.



Publisher: Blackwell Scientific Publications
Price: \$50.00

Managing your Computing - a Practical Handbook is compulsory reading for any person who has any sort of responsibility for computers. It is aimed at the corporate environment, but contains many useful ideas for the home computing enthusiast who is contemplating updating to a later model or acquiring a computer for the first time. The reader is taken through the process of acquiring and using computers from the first steps of defining a policy or strategic plan to implementation and maintenance and so through to sections on managing your personal computing and what the book calls the 'human factor.'

The book is not an easy read. It goes into detail in almost all chapters so that to use the advice presented it is necessary to do some study. Words like cost/benefit ratio, costing analysis, requirements specification, invitation to tender, implementation planning check list, management overview and various other buzzwords of the corporate sector abound. If you can wade through the sheer numbers of this corporate verbiage you will be well on your way to successful and relatively pain free acquisition and implementation phases of computerising. My God, I'm beginning to sound like the book!

Seriously, the book contains a well thought out plan of action for any small to medium size business that is contemplating buying a computer system or upgrading the one they have.

It is as valuable for the disasters it will help you avoid as it is for providing a framework and checklist that you can use to smooth the rocky road from manual systems to computerised ones.

Managers, would be MIS people, Non-DP corporate types and consultants should put this book on their "must read" list.

As for the rest of us mere mortals who are content to blunder along making our own versions of the common computing mistakes, give it a miss.

MASTERFILE PC VERSION 3

Integrated Data filing, Document filing, Word-Processing, Mail-Merge

Every business has two kinds of filing requirement: data field-oriented which we call Data filing and free text which we call Document filing. The traditional approach was to have one program for each - a database (DB) and a word-processor (WP). MASTERFILE PC has already established its reputation as a high-power relational DB at a popular price, but now with the version 3 we have added a powerful WP function. And since both DB and WP functions are managed by the one program, only one system of menus and dialogue need be learned, and there is a natural data-merge function to combine data with text into a mail-merge operation.

MASTERFILE-DB

Address lists • Sales Ledger • Bought Ledger • Inventories • Stock Control • Patient files • Job progress • Price lists • Bank analysis • Shares Portfolio • Photographic index • Property Details • Invoices

There are two main kinds of DB system on the market; those that require time and programming skills to set up and those that have virtually instant usability. MASTERFILE with its totally menu-driven approach is of the latter variety; and yet it offers huge flexibility in data presentation and manipulation.

MASTERFILE Data Filing is unusual in that it offers variable-length records within a direct-access file with a capacity of up to 16Mb or 32,768 records. There can be up to 80 data fields per record, each variable-length up to 254 characters, and data can be character, numeric, or date. Up to 32 user-designed screen/print formats can be used, so that from one data file you can present data as a summary index, and index card, mailing label, whatever, and add such effects as heading, boxes, panels. The relational aspect means that any record being displayed can pick up data from up to four other data files on a key-match basis.

An essential ingredient of a DB system is to be able to search the file and pick out records which match a given set of criteria. MASTERFILE's search functions are impressive and it can search on multiple criteria on any data (not just key fields), with speed and ease.

Arithmetic operations can be defined to operate on and derive numeric data e.g. taxes, percentages, price mark-ups. You can

even perform date-arithmetic such as is required for ageing of accounts and subscription renewals. The logic can include IF/THEN/GOTO constructs for the sophisticated user.

Printing is buffered, so that up to 5 pages of printing can be stacked while you use the program to get on with other tasks. Printer controls can be set to control style and pagination.

We could also mention sorting, import, export, encryption, passwords, date-stamping, serialising, and host of other features - but we don't wish to bore you; if you wish to know more, just ask us!

MASTERFILE-WP

• Letters • Reports • Memos • Journal Extracts • Bibliographic references • Your Next Novel.

Just about every PC user already has some kind of WP system, but the chances are that yours is the kind where each document is a separate DOS file. With MASTERFILE, you can keep all your documents in one large DOS file (up to 16Mb), and manage all your letters, memos, journal extracts as individual documents on a private directory basis; except that our directory (we call it an Index) lets you have useful 30-character names and you can search on the basis of document name, date of last change, or on the text contents themselves. In effect MASTERFILE combines the searching power of DB with the free-format text handling of WP.

MASTERFILE WP Document file has its own selective back-up/restore system, and you can also import and export text files from and to other text systems.

MASTERFILE WP allows up to 6 documents to be open at a time, using the same window or different windows, any of which can be adjusted for size, position, style and colour. The basic WP functions are all there, and some novel ones too - such as 'spot' colour to highlight your text. You can tailor your own printer driver and expansion keys simply by editing two specially-named documents. Maximum document size is 64K, about 20 pages.

Printing options include multi-copy, partial print, pagination, headers and footers, left margin, system date/day/time stamps, serial

numbering. And you can arrange selective text insertion from a MASTERFILE DB file for a mail-merge and several-across label operations. Printing uses the same buffer system as DB, leaving you free to do other tasks while a document is being printed.

HELP AND LEARN

The detailed manual is augmented with tutorial and several demonstration files. And, for the new (or the forgetful) user, HELP can be summoned at the press of a key to augment whatever menu you are looking at. There is even a facility for customising your own HELP frames using the WP function. MASTERFILE can learn too! To program a function key, you just press the 'LEARN' key then use the system normally, then press the function key. Or, you can store the function key in the file for long-term use.

How can MASTERFILE combined DB and WP program run in only a 256K MS-DOS environment? The answer is because it is compact, being totally coded in Assembler - unlike most other commercial software. If you have 512K or more, then MASTERFILE will make even better use of the available RAM. And the minimum disc configuration? Just one floppy. But users with hard discs can take fullest advantage of the large capacity. And what about the monitor? Any type from monochrome to VGA, and yes of course you can customise your preferred colour scheme.

MASTERFILE PC will run any PC-compatible, including any Amstrad PC/PPC, and is available on 3.5" or 5.25" formats in two editions:

Standard: DB only, but with read-only/demonstration WP functions.

Full: DB + WP

You can start with Standard and upgrade to Full later. Campbell Systems in the U.K. also offer upgrades to registered users of MASTERFILE PC version 2 or earlier.

Prices, incl P&P are **\$199.00** (Standard) or **\$269.00** (Full). All mail order enquiries to:

The Amstrad User
1/641 High Street Road
Mount Waverley 3149
Phone (03) 233 9661

or in Melbourne call at The Amstrad User computer shop, also at the above address.

EDITING IN RPED

Helen Bradley explains the use of this extremely popular little text editor for PCWs and PCs

Users of both the Amstrad PCW and PC computers have access to a small text editor called RPED as it is bundled in the software that comes with their computers. Although RPED is really only a text editor and not, by any means, a full blown word processor it does have its uses. What, I hear you ask, is a text editor, and what is the difference between it and a word processor?

Essentially a text editor is a means of entering text into a file. The kinds of files that text editors are very useful to produce are BATCH files (PC's) and SUBMIT files (PCW). BATCH and SUBMIT files are files which contain a number of commands for your computer which instruct the computer to do routines automatically, that would otherwise take you a lot of typing at the keyboard. They automate things and, as computers do not make typing errors, once a BATCH (or a SUBMIT) file is functioning then it will work correctly every time and it will never forget a command.

There is one special kind of BATCH file called the AUTOEXEC.BAT file and one special kind of SUBMIT file called the PROFILE.SUB file. These files are automatically executed every time the computer is booted up if they are present on the boot disc (whether the boot disc be a hard or a floppy disc).

If you have a disc with AUTOEXEC.BAT or PROFILE.SUB on it (or indeed any .BAT or .SUB file) you can inspect its contents by typing:

This screen editor is for small files (up to 750 lines) and uses normal Cursor, Page, Home, End, Insert and Delete keys.

```
f1 = Edit Existing File
f2 = Re-edit Previous File
f3 = Create New File
f4 = Quit
```

FIGURE 1: The RPED Startup screen on PCs.

for PC users: TYPE AUTOEXEC.BAT

and for PCW users: TYPE PROFILE.SUB

These files are straight ASCII files (that is the way the computer expects them to be) and they can be created by using a text editor.

The other types of files that text editors are useful for producing are ASCII source code files for programming whether in the BASIC, C or ASSEMBLY language etc.

RPED is of little use, however, for writing letters and other complex documents as it does not have any typical word processing editing functions such as copy or move, and it does not support fancy typestyles. In addition RPED has no print option so you have to find a way, outside the program, to print the file.

While RPED is far from being a 'state of the art' editor it is useful and it is a significant improvement on the old DOS editor ED (EDLIN) which wins my award for the all time most "user unfriendly" piece of software.

RPED comes with the software included in the PC and PCW computers and so it is 'free'. It comes in two different forms depending of whether you are a PC or a PCW user, although the screen display looks similar on each. PCW owners will know RPED as the file RPED.BAS the ".BAS" extension telling us that it is a BASIC file. This means that you have to load BASIC first and then load RPED. There is, however, a small SUBMIT file on side two of the LocoScript disc (called RPED.SUB) that auto-loads RPED. This file contains the one line command BASIC RPED and it tells the computer to load the BASIC Command Interpreter and then to load and run the file RPED.BAS. You could do this yourself if you typed the words BASIC RPED at the system prompt and you could then delete the RPED.SUB file from your disc and free 1K of precious disc space.

However, as part of the purpose of this article is to give you the tools to enable you to start writing BATCH and SUBMIT files, we won't concern ourselves too much with the odd one or two kilobytes of disc storage.

On the PC, the program is not run under BASIC and is instead, a stand alone executable file called RPED.EXE. To run it, you either type RPED and press <ENTER> at the system prompt (ensuring first that the disc containing the file RPED.EXE is in the drive that you are logged onto and, if necessary, that you are in the sub-directory that contains it), or you can point to the icon for RPED from the GEM desktop screen and double click on it with the left hand button of your mouse.

The startup screen for the PC version is shown in figure 1 while the PCW version looks very similar.

To create a new file press the F3 key for either the PC version or the PCW version. You will then be prompted to enter the name of the new file. On the PCW version you will have to enter the drive letter for the drive that you want to save the

file to, but for the PC version this is optional and you can simply enter the file name only if you wish, and the resulting file will be created in the current sub-directory.

When you have entered the filename and pressed the <ENTER> key you will be taken into the editing area. Here you can type the text of your BATCH or SUBMIT file and, when you have finished, press ESC on the PC or EXIT on the PCW and your file will be saved and you will be returned to the main menu from which you can select F4 to QUIT (PC), or EXIT again to exit (PCW).

RPED has a few editing commands available from its text entry screen, they are:

PCW:

- ALT DOWN ARROW Insert a blank line at the cursor position.
- PLUS KEY (next to the space bar) Toggle on/off text Insert/Overstrike mode.
- ALT C or STOP Exit from the program without saving the file.
- CUT Delete the line that the cursor is positioned in.
- DEL RIGHT Delete the character under the cursor.
- DEL LEFT Delete the character to the left of the cursor position.
- LINE/EOL Go to the beginning or the end of the current line.
- RETURN Move to the next line (doesn't insert a blank line).

PC:

- F9 Inserts a new blank line at the current cursor position (moving the current line down one position).
- F10 Deletes the line that the cursor is situated in.
- INS Toggle on/off the text Insert/Overstrike modes.
- DEL RIGHT Deletes the character immediately under the cursor.
- DELETE LEFT Moves the cursor one position to the left but does not delete any characters.
- DEL Deletes the character one position to left of the cursor.
- CTRL END Deletes to the end of the current line.
- HOME Moves the cursor to the top line of the file but does not alter the column that it is in.
- END Moves the cursor to the last line of the file but does not alter the column position of the cursor.
- TAB Moves the cursor across the screen to the next logical

- PG UP tab stop. Tabs are set for every 8 characters.
- PG DN Moves the cursor up half a screen's depth.
- CTRL BREAK Moves the cursor down half a screen's depth.
- ESC Exit the program without saving the file.
- LEFT AND RIGHT ARROW KEYS Exit the program and save the current file.
- UP AND DOWN ARROW KEYS Move the cursor one character in the direction of the arrow.
- CTRL LEFT ARROW/ CTRL RIGHT ARROW Move the cursor one line up or down the screen
- CTRL LEFT ARROW/ CTRL RIGHT ARROW Moves the cursor to the end/beginning of the current line.

If you want to alter an existing file then choose option F1 - Edit Existing File from either the PC menu or the PCW menu.

PC owners who have exited the program by mistake or who want to go back and re-edit the file that they have just finished working on can press the F2 = Re-edit Previous File and they will be taken back into the file that they were last working on. For PCW owners the key is F5 - To Edit Last Screen.

Remember that there are limits to RPED in both its PC and its PCW version. The PC version is limited to 750 lines of text and the PCW version to about 200 lines of text. This should be more than adequate for most users and any who are extending either package near its limits should be considering whether it really is the best package for them and whether they may be better off with a more powerful editor.

If PCW owners are interested in having a look at the basic code that RPED is written in then you will find that it is not possible simply to load the program and then LIST it, as you would most other BASIC programs, as it has been saved as a protected BASIC file. There are, however, some tricks of the trade that you can use to get around this. Firstly load basic and save a new BASIC file with nothing in it i.e. type NEW and then SAVE "JUNK", A this saves an empty file on your disc in ASCII format. Now load RPED with the command LOAD "RPED and merge your empty file with the command MERGE "JUNK" the result will be a file that you can list, print the contents of and save in unprotected form.

All in all RPED is a useful utility that many users are unaware of, given the lack of coverage of it in the manuals (particularly the PCW version). Next time you have a few minutes to spare load up CP/M or MS-DOS and have a play around with it.

Next month I will show both PC and PCW users how to create a simple menu system for a floppy or hard disc. In setting up the menu we will use RPED to produce the necessary files.

UTILISING UTILITIES

With more PC Public Domain goodies, some news and updates as well as the MODE command explained, here's Chris Collins

Welcome once again to Compatible's Corner. This month we have a bit of news regarding a 4DOS update, another DOS command to learn, and a heap of diskettes to get through.

NEWS FROM THE PUBLIC DOMAIN

First off the mark is news of a 4DOS update to version 2.2. This seems to be a bug fix upgrade more than anything else, and fixes a couple of fiddly little faults. All copies of the diskette that have been sent out have the new version of the program on it. They also have a copy of 4DOS286, the 80286/80386 specific version. I dialled the United States of America (say that with an American accent) last night (14 AUG '89) to get it and find out what the differences are. It does seem a bit smaller and faster, but unfortunately it is only version 2.1 that I was able to get. Still, it does work and that is the main thing. It is now also on the 4DOS diskette.

Another bit of news relates to the new Japanese archiving program LHice. This is an update to LHARC version 1.13c and is now to version 1.14. I think that the change in name is to save any embarrassment with S.E.A. over the ARC part of the name. The new version now produces .ICE files (goes well with the melting and freezing), but has no trouble un-archiving .LZH files if you tell it to. I won't be releasing it to you yet, as I heard yesterday that there is a possibility that it has a

virus. Just hang on until I can test it thoroughly.

THE MODE COMMAND

The command for this month is MODE. It is used to set the way that a printer, serial adaptor or colour graphics card operates. The syntax changes with each application, so we will have to go through this a couple of times to get all options.

SYNTAX 1 (Printer Control)

```
[d:][path]MODE LPT# [:][n][.m][.P]
```

where the following conditions apply;

- [d:][path] selects the drive and path where the MODE.COM file are stored. This can be a subdirectory in the path set-up by the PATH command in your AUTOEXEC.BAT file.
- # is the printer number (either 1,2 or 3)
- n is the number of characters per line (either 80 or 132)
- m is the lines per inch vertical spacing (either 6 or 8)
- P specifies continuous retries on all time-out errors.

EXAMPLE 1:

```
A>mode LPT1;132,8
```

This will set the printer attached to LPT1 to 132 characters per line with 8 line per inch vertical spacing. The power-on default settings are 80

characters per line with 6 line per inch spacing. If you specify an incorrect value for either n or m, the values will be ignored and the old values will be unchanged.

SYNTAX 2 (Switching Display Adaptors)

```
[d:][path]MODE n, OR  
[d:][path]MODE [n],m[,T]
```

[d:][path] is the same as above. This is simply the directory and drive where MODE.COM is stored.

[n] is either 40, 80, BW40, BW80, CO40, CO80 or MONO, depending on your choice of the following;

- 40 will set the number of characters displayed on the Colour Graphics Adapter card to 40 per line.
- 80 will set the number of characters displayed on the Colour Graphics Adapter card to 80 per line.
- BW40 will switch to the Colour Graphics Adapter card, set the display mode to B&W, and display 40 characters per line.
- BW80 will switch to the Colour Graphics Adapter card, set the display mode to B&W, and display 80 characters per line.
- CO40 will switch to the Colour Graphics Adapter card, enable colour, and display 40 characters per line.
- CO80 will switch to the Colour Graphics Adapter card, enable colour, and display 80 characters per line.
- MONO will switch the active display to the Monochrome Graphics Card, which always displays 80 characters per line.
- m is either R or L, depending on whether you wish to shift the display RIGHT or LEFT.
- [T] requests a test pattern to ensure that you have it aligned correctly.

EXAMPLE 2

MODE MONO will select the monochrome graphics adapter in the machine, if one exists. MODE CO80,r,t will set the number of characters per line to 80, enable colour, shift the screen 2 characters

to the RIGHT, and display a test pattern for you to check further without having to exit MODE.

SYNTAX 3 (COM Port Set-Up)

[d:][path]MODE COMn:baud[,parity
[,databits[,stopbits[,P]]]]

[d:][path] simply relates to the drive and directory in which MODE is stored.

COMn relates to the com port specified where n can be either 1 or 2.

baud tell DOS at what speed to run the COM port specified. This can be any of the following; 110, 150, 300, 600, 1200, 2400, 4800 or 9600. Only the first two numbers of the speed are required, any characters after that will be ignored.

[parity] can be either N (none), 0 (odd) or E (even). The default setting is E (even).

[databits] can be either 7 bits or 8 bits. Default is 7.

[stopbits] can be either 2 or 1. If baud rate is 110, default setting is 2, otherwise default setting is 1.

These are the protocol parameters. When you set-up a comport, you must specify at least the baud rate. The other parameters can be omitted, with the default settings being accepted, by entering only commas as in the following examples.

EXAMPLE 3

MODE COM1:12,n,8,1,p

This will set the operation of COM1 to 1200 baud, no parity, 8 databits, 1 stopbit, and specify that a serial printer will be attached.

MODE COM1:12,,,,P

This will specify that COM1 is to be set to 1200 baud with the defaults of parity even, databits 7, and stopbits 1, being acceptable. Again, the p specifies a serial printer is attached.

SYNTAX 4 (Redirection of LPT output)

[d:][path]MODE LPT#:=COMn

[d:][path] again specifies the drive

and directory that contain the MODE.COM file.

LPT# where the # can be either 1, 2 or 3 (available printer ports).

COMn where n can be either 1 or 2 (available COM ports).

Before you use the MODE command to redirect printer output to a COM port, you must be sure to initialise the COM port using SYNTAX 3 as above.

EXAMPLE 4

MODE LPT1:=COM1

This will redirect all output for the printer connected to LPT1 to be redirected to COM1.

Well, that about covers the MODE command. As you can see, it is a very powerful command, and is not to be taken lightly. However, it can be used to customise your system to suit your requirements and make life easier for you.

Seeing as we have quite a few diskettes to get through this month, we had better get on with it.

DEWER UTILITIES

This is a one diskette collection of utilities from a gentleman called Robert Dewer of New York. The current version on the diskette is v6.01, and the registration fee is US\$40. Registered users will receive the latest version of the software, if they do not have the current one, and notices of updates as they arrive.

The package consists of 22 utilities, and they are listed below;

DAED:- v6.03 - Advanced editor

DCHK:- v6.03 - File check-sum to ensure the integrity of files

DCOP:- v6.03 - File copier

DCUR:- v6.03 - Cursor control

DDEL:- v6.06 - File deletion

DDIF:- v6.08 - File comparison

DDIR:- v6.03 - Directory listing program

DDOC:- v6.06 - Document generator

DEXF:- v6.02 - File examiner

DFPR:- v6.04 - Fast print handler

DFSP:- v6.03 - File space

DKEY:- v6.04 - Keyboard buffer extender

DLOF:- v6.03 - List object file as created by programming languages

DPHX:- v6.03 - Print file in hexadecimal

DPRC:- v6.03 - Printer control program

DPRF:- v6.06 - Print files

DREN:- v.608 - Rename files

DSTS:- v.604 - Steady scroll

DTRP:- v.603 - Trap handler

DTYP:- v.603 - Type file

DVOL:- v.603 - Volume copy

DXFH:- v.604 - File examiner in hexadecimal

DVED:- v6.02 - Editor (Also included as part of the package).

As you can see, this package contains a wide range of programs. If any of the utilities are loaded without parameters, they will automatically display full documentation. For most of the utilities in the set, this amounts to a single page of text, that can be printed using SHIFT-PrtSc. For some of the utilities, the documentation is a lot more extensive and menu drive interactive documentation is provided. These utilities can also print out a fully formatted manual on request.

CALMER UTILITIES

This is a three diskette collection of utilities from an AUSTRALIAN author. The company involved is CALMER SOFTWARE, and they are from Hornsby in New South Wales. The registration fee for the package is AUS\$30, and a rebate scheme applies for registered users. If 4 people register the package with your name on it, you will receive back the newest version of the software, including any new utilities, and a cheque for AUS\$20. After the first four you will receive a new update as each 10th user registers with your name.

It is too complicated to go into all of the utilities here, but suffice it to say that the package is well worth the \$30 requested. Some of the utilities are as follows;

SIPLUS:- This one will show you extensive information about your

computer system, entirely depending on what system it is. The information can run to 7 or 8 screens full. The licensed version has a couple of extra options.

VECTOR:- This one will show the status and type of any given interrupt vector.

NBY (Not Born Yesterday):- This is a program to try and protect your hard disc drive against Trojan programs that will attempt to corrupt files on your hard disc. The registered version of the software will automatically restore the system files, if it finds them to be corrupted.

SCR:- This one requires an EGA card in the system to work. It will allow you to flip between 25 and 43 line mode. Do not use this with ANSISYS, as it only supports 25 line mode.

And there are many more great programs in this lot to explore!

PFS CLIP ART

For those of you out there who use PFS First Publisher, I have a beauty available for you this month. We

have available 9 diskettes of .ART files for you to use in your documents. These are briefly listed below:

PFS Clip Art 1:- This diskette contains approximately 100 .ART files that all relate to animals.

PFS Clip Art 2:- This diskette contains approximately 90 pieces of .ART files relating to computers, medical and music.

PFS Clip Art 3:- This diskette contains approximately 80 .ART files relating to women and people.

PFS Clip Art 4:- This diskette contains approximately 105 .ART files relating to men.

PFS Clip Art 5:- This diskette contains approximately 70 pieces of clip art relating to transportation.

PFS Clip Art 6:- This diskette contains approximately 85 pieces of miscellaneous clip art.

PFS Clip Art 7:- This one contains another 80 pieces of miscellaneous clip art.

PFS Clip Art 8:- This diskette contains 105 pieces of .ART files relating to sports.

LAST MINUTE UPDATES

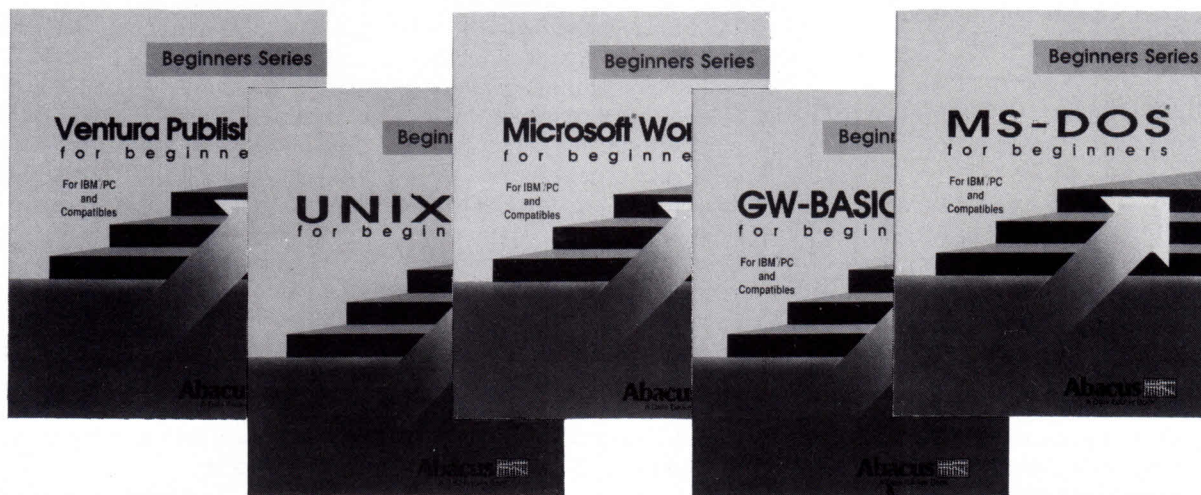
A late bit of news regarding To_Do, W-W-W-W, and Scout. It appears that a gremlin got into the PKUNZIP.EXE file on these diskettes. If you are having any problems, please erase the PKUNZIP.EXE file off the diskette and copy it from another working copy. Failing that, please send the diskettes back, and I will put a working and tested copy of PKUNZIP.EXE back onto it. Anybody receiving diskettes posted after 27th August have been rechecked and tested and will work.

Well, I think that this will about finish us for this month. If you require any of the diskettes listed above, simply send a cheque for \$7.50 per diskette to the following address and they will be forwarded to you within 14 days:

MacroDisk
1 Woods Street,
NEWPORT 3015

Until we meet again next month, have fun with your computer!

THE GUIDES BY YOUR SIDE



The Abacus Beginner's Series is a set of books covering a wide variety of software applications. They're written for today's personal computer users who have limited time. The authors' goal is to make you more productive sooner. Each book is written in easy-to-understand language. These books remove the *computerese* that new readers find confusing. They present carefully chosen, practical examples and avoid lengthy theoretical explanations. Beginner's Series books show you how to use the important features of an application step-by-step. You'll be "up and running" quickly.

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You begin as an inexperienced oceanographer. You must build not only your experience, but also your reputation as you have to attract commercial sponsorship. You are in total control over your ship, the supplies, the personnel and the equipment. Search for the Titanic includes over 75 wrecks to explore, more than 100 navigational maps and charts and 47 ports of call. Realistic weather patterns and currents, sophisticated sonar, magnetometers, underwater cameras, mini-sub and bathyspheres all come into play as you navigate the trade routes in search of missing wrecks.

BIRDS 'N' BEES - PC

Never before has human sexuality been so highlighted as in recent times. The AIDS epidemic, a growing rate of sexual abuse and advanced education techniques means children are being exposed, more and more to their own sexuality. *BIRDS 'N' BEES* has been written by a team of psychologists to allow a child to comprehensively learn about their human sexuality at their own pace. The program includes sections on human reproduction, growth and development, communicable diseases and what your child should know about dealing with strangers.

The program is fully under parental guidance. Parents can set a password for each child. This password prevents the child advancing too quickly, or from just going from one part of the program to another just out of curiosity.

BIRDS 'N' BEES is the ounce of prevention that is worth a pound of cure.

VIDEO WIZARD - PC

The Video Wizard is a two fold program designed to both manage and enhance your collection of video cassettes. The first part is a database program that will track your usage of video cassettes, what is stored where, how much blank tape you have and on which cassette.

The second part is Video Wizard's inbuilt character generator. Using this, you can create professional titles screens, link them together in whatever order you want, display them or screen for precise periods, all while you are recording to video tape.

**NB. 1. FOR PC'S, THIS PROGRAM REQUIRES A CGA CARD.
2. FOR PC'S, FOR ELECTRONIC TITLE TRANSFER, A CGA CARD WITH COMPOSITE VIDEO OUTPUT JACK IS REQUIRED.**

Available from: John Martins, Harris Scarfe, Harvey Norman, Grace Brothers, Computer Base (Castle Hill & Bankstown), Maxwells of Rockdale, Ettalong & Melbourne, Steve's (ACT) or other retailers around Australia.

For the nearest retailer in your state contact:

NSW: Pactronics P/L, 98 Carnarvon Street, Silverwater	(02) 748 4700
VIC: Pactronics P/L, 51-55 Johnston Street, Fitzroy	(03) 417 1022
QLD: Pactronics P/L, 12 Stratton Street, Newstead	(07) 854 1982
SA: Baringa P/L,	(08) 378 9177
WA: Pactronics WA, Unit 13, Rear 113 High Road, Willetton	(09) 354 1122
NEW ZEALAND: Micro Dealer, 68F Greenmount Drive, East Tamaki, Auckland	(09) 274 9300
MAIL ORDER: The Amstrad User, 641 High Street Road, Mount Waverley, Vic 3149.	(03) 233 9661

NATIONWIDE USER GROUPS

There have been a heap of changes this month so have a careful read of these pages to make sure you are up-to-date with names, addresses and times. The Contact list has been re-born to get rid of dead listings, but so far we have had only two people renew their places.

WESTERN AUSTRALIA

ALBANY AMSTRAD USER GROUP

President: Gerry Barr (098 41 6884)
Secretary: Steven Hands (098 44 7807)
Treasurer: Gavin Grose
Venue: Priess Street Centre, 14 Priess Street, Albany on the first and third Mondays of each month at 7.00 pm.
Mail: 20 Anuka Road, Albany, WA 6330

AMSTRAD USER GROUP (BUNBURY)

Chairman: Brian Ballard (097) 217 199
Secretary: John Cohen
Venue: 90 King Rd, Bunbury on the 3rd Saturday of every month at 3pm.
Mail: P.O. Box 77, Brunswick Jn, WA 6224

AMSWEST (Perth)

President: Thelma Ardron (09 361 8975)
Vice Pres: John Firth (09 364 1360)
Secretary: Neil Miller (09 272 3994)
Asst. Sec.: David Ammon (09 448 5378)
Treasurer: Darryl Dunlop (09 448 6440)
Venue: 293 Bagot Road, Subiaco 6008 on the first and third Tuesdays of each month at 7.30.
Mail: 6 Weston St., Carlisle. WA. 6101

AMSWEST (Blackwood) USERS GROUP

This small group is affiliated to AMSWEST (Perth). For more details contact George Muscat on (097) 61 1488.

ROCKINGHAM-KWINANA AMSTRAD USER GROUP

President: Ben Hille (592 1233)
Vice-Pres: Keith Saw
Treasurer: John Hille
Secretary: Renata Hodgekinson
Venue: Cooalongup Primary School, Westerly Way, Cooalongup (Rockingham), every second Wednesday at 7.30 pm.
Mail: c/o- 104 Milna St, Hillman 6168.

SOUTHSIDE AMSTRAD USER CLUB

President: Brian Purser (09 398 1168)
Secretary: Lynda Blissett (09 459 6448)
Treasurer: Eric Tytherleigh (09 390 8865)
Venue: Huntingdale Primary Sch., 85 Malilda St, Huntingdale every 2nd and 4th Wednesday of each month from 7.00 pm.
Mail: The Sec., Southside Amstrad Users Club, 25 Hafner Crt, Maddington, WA 6109.

AMSTRAD COMPUTER CLUB TOM PRICE

President: Colin Smith (091 89 2074)
Secretary: John Eliot (091 98 1735)
Treasurers: P. & C. Montgomery (091 89 2398)
Venue: Primary School every 2nd Wednesday night. Contact the above for more details.

SOUTH AUSTRALIA

AMSOUTH AMSTRAD USER'S GROUP

President: Drew Ames (085 371 0151)
Treasurer: Bob Bleachmore (085 56 2048)
Secretary: Will Vaughan after 6pm; (08 382 8312)
Venue: Christies Beach High School, Western Section, Beach Road, Christies Downs (adjacent to Staff Car Park off Mander Road) every 2nd Wednesday at 7.30.
Mail: PO Box 612, Noarlunga Centre, SA 5168

AMSNORTH AMSTRAD USER'S GROUP

Organisers: J.T. Clarkin (08 262 6342)
R. Britton (08 258 7861)
Venue: Lacrosse Hall, Terama Street, Gepps Cross every Wednesday at 7.00 p.m.

AMSTRAD COMPUTER CLUB INC. (SA)

President: Ross Barker (08 374 0565)
Vice Pres: David Simpson (08 373 1693)
Vice Pres: Paul Beard
Treasurer: Las Jamieson (08 356 9612)
Secretary: Debra Dienet (08 339 1314)
Venue: Torrensville Primary School, Torrensville every tuesday between 6.30 & 9.00pm.
Mail: PO Box 210, Parkholma, SA 5043

NORTHERN COMPUTING SOCIETY INC.

President: Valerie Clarke (08 248 4031)
Vice Pres: Tony Mackereth (08 281 3968)
Sec./Treas: Graham Brewin (08 258 5320)
Venue: Drop-In Centre, Salisbury North Primary School, cnr. Bagster & Woodyates Rds every Wednesday from 7.00.
Mail: PO Box 482, Salisbury, SA 5108

PORT LINCOLN AMSTRAD USERS GROUP

Contact: Rita Bascombe (086 82 1633)
Venue: Third Tuesday of each month from 8.00 pm. Ring above number for address.

SOUTH EAST AMSTRAD USER GROUP (SA)

Contact: Neil Taylor (087 25 8068)

Venue: Mount Gambier from 1.00p.m. to 4.00p.m. on the 3rd Sunday of each month. Ring above number for address.

Venue: Cnr. Charles and Appleby Drive, Cardigan Village on the first Sunday of the month at 3.00 pm.

VICTORIA

CENTRAL AMSTRAD USER SOCIETY

President: Fred Gillen (03 580 9839)
Vice-Pres: Dennis Whelan (03 367 6614)
Treasurer: Doug Jones (03 560 8663)
Secretary: Craig Tooke (03 359 3736)
Venue: Bogart's Restaurant on the corner of Victoria and Enrol Streets, North Melbourne on the first Sunday of each month starting at 1.00 pm.

EASTERN AMSTRAD USER GROUP Inc.

President: Tony Blakemore (03 890 3116)
Secretary: S. Muir
Les Kovack (056 234 836)
PCW rep: Ron Hawthorn
Venue: St. Ninian's Church Hall, cnr. McCracken Avenue and Orchard Grove, South Blackburn on the 1st Sunday of each month from 1.00pm.
Mail: PO Box 583, Croydon, 3136

GEELONG AMSTRAD USER CLUB

President: Arthur Pounsett (052 78 2160)
Vice-Pres: Diethard Kuhlmann (052 81 9200)
Secretary: Mick Stone (052 91 505)
Venue: South Barwon Community Services Ctr, 33 Mount Pleasant Rd, Belmont on the first Wed. of each month, from 7.30pm
Mail: 346 Autumn St., West Geelong, 3218.

GOULBURN VALLEY AMSTRAD USERS CLUB

President: Roger Tacey (058 23 1449)
Secretary: Rod Raven (058 21 9034)
Treasurer: Bev Felton or (058 21 2703)
Venue: North Shepparton Community House, Olympic Ave. Every 3rd Thur. from 7:30pm
Mail: P.O. Box 1713, Shepparton 3630

MARYBOROUGH AMSTRAD USER CLUB

President: Chad Banfield (054 68 1351)
Treasurer: Brendan Severino (054 61 3191)
Secretary: J. Fothergill (054 75 2667)
Venue: Maryborough CCC each week on Tuesday from 12.10 p.m. to 12.45 p.m.

MOUNTAIN DISTRICT AMSTRAD USER GROUP INC.

President: David Jamieson (03 870 1016)
Treasurer: Ian Pearson (059 965 019)
Secretary: Ian Pearson (059 965 019)
Venue: Country Womens Association Hall, 4 Sundew Avenue, Boronia from 7.00 pm. every 2nd & 4th Monday of the month.
Mail: PO Box 132, The Basin, Vic 3154

NORTHERN AMSTRAD USER GROUP

Contact: Brian Ellis (03 469 4425 A/H)
Venue: Every three weeks in Brunswick West for CPC owners with a sincere interest beyond games.

SOUTHERN AMSTRAD USER GROUP INC.

President: Gerry Goody (03 786 3489)
Secretary: Bob Patterson (03 786 6976)
Treasurer: Geoff Wales (03 786 9212)
Venue: Karingal Tennis Club, Gretana Crescent, Frankston every third Tuesday at 7.30pm
Mail: The Sec., PO Box 100, Seaford, Vic 3198.

SUNBURY MELTON AMSTRAD USER GROUP

Contacts: Wayne Urmston (03 744 2719)
Norman McEntee (03 743 7104)
Venue: Toolern Vale Hall, Toolern Vale every third Saturday of the month at 10.00 a.m.

WENDOUREE AMSTRAD USER GROUP

Contact: Brad Maisey (053 44 8356)

WESTERN AMSTRAD COMPUTER CLUB

Venue: Fairbairn Kindergarten, Fairbairn Road, Sunshine on alternate Tuesdays from 6.30pm.
Mail: PO Box 161, Laverton 3028

ACT

CANBERRA AMSTRAD USER'S GROUP

Convenor: Paul Kirby (062 86 5460)
Secretary: James Gifford (062 47 5126)
Treasurer: Rod MacKenzie (062 54 7551)
Venue: The Oliphant Building, ANU, Canberra on the first Tuesday of each month from 7.30 pm.
Mail: PO Box 1789, Canberra, ACT 2601.

NEW SOUTH WALES

BLUE MOUNTAINS AMSTRAD USERS

President: Bob Chapman (047 39 1093)
Vice Pres: Dennis Shanahan (047 39 4568)
Treasurer: Peter Traish (047 53 6203)
Secretary: Malcolm Stone (047 51 2791)
Jun. Rep: Nathan Stone (047 51 2791)
Venue: Springwood Neighbourhood Centre, Macquarie Road, Springwood on 2nd and 4th Wednesday of each month at 8.00pm.

CENTRAL COAST AMSTRAD USERS CLUB

President: Lloyd Mitchell (043 88 2950)
Secretary: Douglas Green (043 42 2568)
Treasurer: Nick Winter (043 84 6766)
Venue: Minjara Recreation Club, Adelaide St, Tumbi Umbi every 2nd and 4th Monday at 7.30 p.m. sharp. Also every 3rd Thurs. at 'Meals on Wheels', Woy Woy.
Mail: C/o 1/254 Railway St, Woy Woy, 2256

COFFS HARBOUR AMSTRAD COMPUTER CLUB

President: Bruce Jones (066 52 8334)
Secretary: Colin Jones (066 49 2127)
Treasurer: Brian Claydon (066 49 4510)
Venue: Orara High School, Joyce Street from 7.00 on the first Friday of each month.
Mail: 169 Beryl St, Coffs Harbour, 2450

HAWKESBURY AMSTRAD USER GROUP

President: Terry Webb (045 76 5291)
Secretary: Dave Keen (045 77 5536)
Venue: Richmond Swimming Club Rooms every third Tuesday of the month at 7.30 pm.

ILLAWARRA COMPUTER USERS CLUB

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Secretary: Neville Dillon (042 56 2642)
Treasurer: Steve Astill (042 71 5462)
Librarian: Peter Platts (042 56 1956)
Venue: AGA Gremania Club, Berkeley at 2.00 pm. every third Saturday of the month.

LISMORE DISTRICT AMSTRAD COMPUTER CLUB

President: Tom Wright (066 291 302)
Secretary: Russell Ball (066 216 888)
Treasurer: Deborah King (066 864 424)
Librarian: Ben King (066 864 424)
Venue: Gonnalabah Public School, Ballina St. on the last Tuesday of each month from 7pm.
Mail: PO Box 771 Lismore, NSW 2480

PARKES COMPUTER USER GROUP

Contact: Eileen Magill (068 643 285)
Mail: North Gunning, Gunningbald, NSW 2876

S & W MILLER AMSTRAD USER'S CLUB

President: Wal Sellers (049 33 5459)
 Secretary: Nikki Lee (049 33 5459)
 Treasurer: Georgina Todd (049 66 2788)
 Venue: Maitland Park Bowling Club, Maitland on the second Tuesday of each month at 7.30pm

S & W MILLER NEWCASTLE USER GROUP

President: Chris Hollander
 Secretary: Mark Pogson (049 613181) B/H
 Venue: Hamilton North Bowling Club, Boreas Road, Broadmeadows on the third Tuesday of each month.

MURWILLUMBAH AMSTRAD USERS GROUP

President: Nick Bruin (066 79 3280)
 Vice Pres: Kel Philip (066 77 1440)
 Secretary: Laura Goode (066 72 2499)
 Treasurer: Lorraine Montgomery (066 72 1823)
 Venue: Murwillumbah High Sch. on the 2nd Wednesday of each month at 7.00p.m.
 Mail: c/o Post Office, Burringbar, 2483

NEWCASTLE AMSTRAD USER GROUP

President: John Harwood
 Treasurer: Erica Harwood
 Venue: Contact John Harwood at the address shown below.
 Mail: PO Box 18, Charlestown, NSW 2290

PCW AUSTRALIA GROUP

Secretary: Clyde Gittins (02 579 3984)
 Treasurer: Geoff Bolton (02 745 2230)
 Venue: Burwood RSL Club, 96 Shaftesbury Road, Burwood every second Tuesday of the month at 7:30 pm.
 Mail: PO Box 478, Smithfield, NSW 2164.

PORT MACQUARIE AMSTRAD USERS GROUP

Mail: Craig Tollis, Box 584, Pt. Macquarie, 2444.

SYDNEY AMSTRAD COMPUTER CLUB

President: Tom Caldwell (02 661 7573)
 Sec/Treas: Reed Walters (02 560 9487)
 Venue: Camdenville Comm. Ctr., Newtown on the 1st Saturday of every month at 2.00 p.m.
 For more details contact the Secretary between 6.00 p.m. and 9 p.m.
 Mail: PO Box 423, Matraville, 2036

SYDNEY PC1512 USER GROUP

Contact: Geoff Craine (02 76 6467) A/H
 (02 412 9213) B/H
 Venue: To be arranged; meeting initially on the third Tuesday of each month at 7.00 pm.

QUEENSLAND

AMSTRAD AND PC USER GROUP OF LOGAN

President: Michael Toussaint (07 200 5414)
 Vice-Pres: Peter Incoll (07 208 2332)
 Secretary: William K. Giles
 Treasurer: Ronald Waters (075 317 838)
 Librarian: Carol Watts (07 287 2882)
 Newsletter: Rhys Watkins
 Venue: Loganlea State High School (in the Communications Room) every 3rd Sat. of the month starting at 2.00 p.m. A Basic programming course is held fortnightly.
 Mail: 10 Carramar St, Loganlea, 4204

BRISBANE AMSTRAD COMPUTER CLUB

President: John O'Connor (07 271 3350)
 Vice Pres: John Digby (07 351 2553)
 Secretary: Bob Ashe (07 355 5699)
 Treasurer: Ivan Dowling (07 269 8795)
 Tech. Editor: Franz Hendrickx (07 356 0633)
 Venue 1: NEWMARKET: Newmarket State Sch., Banks St., Newmarket on the 2nd Sat. of each month at 1.30p.m. Any executive member can be contacted for information.

Venue 2: REDLAND BAY: Birkdale State Sch., Agnes St, Birkdale 4159 on the 3rd Sat. of each month from 1.00pm. Co-ordinators are Paul Peterson (07 206 7214) and New Taylor (07 207 3435).

Venue 3: SUNNYBANK: Sunnybank State Sch., Turton St, Sunnybank 4109 on the 3rd Sun. of each month from 1.30pm. Contact Jim Papadimitriou (07 344 2067).

Venue 4: WESTERN SUBURBS: Jamboree Heights State Sch., 35 Beanland St, Jamboree Heights 4074 on the 1st Sat. of each month from 1.30pm. Contact Gordon Bradford (07 814 4746) or Helda & Jim James (07 376 1137).

Venue 5: REDCLIFFE PENINSULA: Kippa-ring State Sch. (library), Elizabeth St, Kippa-ring 4020 on the 2nd Sun. of each month from 1.30pm. Contact Ivan Dowling (07 269 8795)

Mail: PO Box 167, Alderley, Qld. 4051

BUNDEBERG AMSTRAD USER'S GROUP
 President: Ray Babbidge (071 72 1223)
 Secretary: Clive Barrett (071 71 3668)
 Treasurer: Sheila Coe (071 72 8884)
 Venue: The third Tuesday of the month. For more details contact the above.
 Mail: 11 Laack St., Bundaberg, QLD 4670.

CABOOLTURE AMSTRAD USER GROUP
 President: John D'Archambaud (071 95 4860)
 Secretary: Stephen Yench
 Treasurer: Craig Deshon
 Venue: Contact above number for more details.

CAPRICORN AMSTRAD USERS GROUP
 Pres/Sec: Anthony Trost (079 33 1951)
 Treasurer: Dorothy Jasperson
 Venue: Block 2, Waraburra State School, Johnson Road, Gracemere on the first Friday of each month at 7.00 pm.
 Mail: 4 Sunrise Crescent, Gracemere, 4702

COMPUTER USER GROUPS OF AUSTRALIA Pittsworth Branch
 President: David Siebuhr
 Contact: Ron Langton (076 931 690)
 Venue: Every first Tuesday of every month from 5 pm. at the St. Peter Lutheran Church Hall, Grand Street, Pittsworth.
 Mail: CUGA, PO Box 166, Pittsworth, 4356

GOLD COAST AMSTRAD USER GROUP
 President: Stephen Greenwood (075 572 442)
 Treasurer: Pamela Scott (075 323 334)
 Secretary: Ray Maclaren (075 398 743)
 Venue: Benowa State High School, Mediterranean Drive, Benowa on the first Saturday of each month at 2.00 pm.
 Mail: 7 Coral Gables Key, Broadbeach Waters. QLD 4218.

IPSWICH AMSTRAD USER GROUP
 Contact: Peter Wighton (07 288 4571)
 Venue: Every second Wednesday from 7.15 p.m. at Bremer High School, Blackstone Rd, Raceview.

MACKAY AMSTRAD USER GROUP
 Contact: Des Mulrealey (551 409)
 Geoff Taylor (552 350)
 Venue: Meet every second Sunday morning. Contact the above for location and time.

PENINSULA AMSTRAD CLUB (amalgamated with BACC)
 President: Ivan Dowling. (07 269 8795)
 Treasurer: Keith Johnston (07 203 2339)
 Venue: Kippa-Ring State School Library, Elizabeth Avenue every third Tuesday of the month at 7.30 pm.

TOOWOOMBA AMSTRAD USERS GROUP
 President: Tony Carlaw (076 91 6161)

Secretary: David Culliford (076 32 7277)

Asst Secs: Chris & Glen Jones (076 91 2643)
Treasurer: Anglea Gschidle (076 34 1692)
Librarian: Shane Gschidle (076 34 1935)
Venue: Toowoomba Education Centre, Baker Street, Toowoomba on the 4th Monday of each month starting at 7.30 pm.

Mail: c/o Secretary, 58 Curzon St, Toowoomba, QLD 4350

TOWNSVILLE AMSTRAD USER GROUP
 President: Ian Wallace (077 73 1798)
 Vice Pres: Doug Seimes (077 79 6011 xt252)
 Treasurer: Chris Nisen (077 79 6299)
 Secretary: Alistair Buckingham (077 73 3955)
 Venue: Science Block of the Kirwan High School in Thuringowa Drive on the first and third Tuesdays each month at 7.30pm.

THE WARWICK AMSTRAD USER GROUP
 President: Mrs. D. Christensen
 Secretary: John Wode (076 61 5176)
 Treasurer: Neville Christensen

WEIPA AMSTRAD USERS CLUB
 President: Andrew Seaborn
 Vice-Pres: Dave Wootton
 Treasurer: Frances Casey
 Secretary: Gary Chippendale (070 69 7448)
 Venue: Noola Court in Weipa. Contact above for more details.
 Mail: 15 Noola Court, Weipa, QLD 4874.

WESTERN SUBURBS AMSTRAD USERS GROUP
 President: Peter Wighton (07 288 4571)
 Secretary: Jimmy James (07 376 1137)
 Contact: Keith Jarrot (07 376 3385)
 Venue: The Jamboree Heights State Primary School, 35 Beanland Street, Jamboree Heights at 1.30 p.m. on the first Saturday in each month.
 Mail: Jimmy James, 36 Penong Street, Westlake, Brisbane 4074.

SOUTHERN TASMANIAN AMSTRAD CLUB
 President: David Burt (002 44 3385)
 Secretary: Lance Brown (002 28 2018)
 Treasurer: Cindy Campbell (002 34 8003)
 Venue: Glenorchy Regional Library, Glenorchy at 7:30pm on the 4th Wed. of each month.
 Mail: PO Box 247, North Hobart, 7002

NORTHERN TASMANIA AMSTRAD COMPUTER CLUB
 President: David Double H (003 444 243)
 V. Pres.: Shane Crack H (003 446 525)
 Sec/Treas: Enid Baker B (003 431 313)
 Librarian: Paul James H (003 273 525)
 Junior Del: Jason Donati H (003 316 597)
 Tech. Off.: Richard Wilson H (003 931 437)
 Venue: Launceston Community College (opposite Park Street) in Room 27 on the first Saturday of the month at 5.00 p.m.

N.W. COAST AMSTRAD USER'S CLUB
 President: Peter Gibson (004 24 7586)
 Treasurer: John Westerhof (004 24 3977)
 Secretary: John Westerhof (004 24 3977)
 Venue: Don College, Watkinson St Devonport the third Sunday of every month at 7.30pm.
 Mail: Secretary, 7 Bishton St, Devonport, Tas.

AMSTRAD USERS GROUP
 Contact: John Court (666 143 A/H)
 Venue: Oranga Scout Hall, Fergusson Park, Waitangi Road, Auckland. Between 9.30 am and 4 pm on the third Saturday and the last Sunday of the month. CPC and PCW's catered for.

WELLINGTON AMSTRAD USER GROUP
 Contact: Tony Tebbis 791 072 (evgs)
 Venue: Cafeteria, NZ Fisheries Research Division, Greta Point, on the first Monday of each month from 7.30 pm.
 Mail: PO Box 2575, Wellington, New Zealand.

Venue: Four Avenues School, cnr. Madras Street and Edgeware Road, Christchurch 1 on the fourth Wednesday of each month.

Mail: C/o 50 Rapaki Road, St. Martins, Christchurch. 2 NZ.

WELLINGTON AMSTRAD USER GROUP
 Contact: Tony Tebbis 791 072 (evgs)
 Venue: Cafeteria, NZ Fisheries Research Division, Greta Point, on the first Monday of each month from 7.30 pm.
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 Mail: PO Box 2575, Wellington, New Zealand.

User Group Contact List

The following people are interested in starting up user groups with other local Amstrad users, or are available to offer help to other Amstrad users in need of a hand. Please do not abuse the help being offered.

New South Wales
 Chas Fletcher, Toongabbie
 (02) 631 5037

South Australia
 Dave Green, Port Pirie
 (086) 326 834

To Let
233 9661

TASMANIA

SOUTHERN TASMANIAN AMSTRAD CLUB
 President: David Burt (002 44 3385)
 Secretary: Lance Brown (002 28 2018)
 Treasurer: Cindy Campbell (002 34 8003)
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 Venue: Don College, Watkinson St Devonport the third Sunday of every month at 7.30pm.
 Mail: Secretary, 7 Bishton St, Devonport, Tas.

NEW ZEALAND

THE AMSTRAD COMPUTER CLUB OF CANTERBURY
 Contact: Ian Orchard 524 064

ADVENTURER'S ATTIC

Philip Riley has a look at people, monsters and things that move around your game. There are questions answered too!

As I am sure you have noticed, we have an adventure by Barrie Eaton in the mag at the moment. He has, among many things, incorporated other people in the game with whom you can talk. So I thought that this month we would look at a few ideas along these lines.

Most of the top adventures on sale today have more than one character in them. In fact, most times you will find many people or creatures wandering around the game. In most cases you can talk to them and they may even help you, so how do you go about programming something like this?

We will start off with something simple - a guard walking backwards and forwards on the wall of a castle.

happens to him.

The basic lines below will move him backwards and forwards:

```
10 IF e=0 THEN gp=gp+1:IF gp=37
THEN e=1
20 IF e=1 THEN gp=gp-1:IF gp=33
THEN e=0
```

The variable gp is the guard's position on the map. The variable e shows which way the guard is walking; 0=EAST and 1=WEST.

Now, how do you incorporate this routine into your adventure? You could use one of two methods. One would be to put it into a subroutine and jump to it using the EVERY command; the guard moving to the next location say, every twenty seconds. Alternatively,

disable the EVERY command (if you were using the interrupt) or set a variable to jump past the routine. This is a fairly simple way of doing things; the next step on from this is people who move around the game at random.

To do this you will need to set up a subroutine that moves all of the people. So, let's look at moving two people around the game. For arguments sake we will say that they are your friends and that they cannot be killed. Some things to consider when programming this sort of thing are listed below:

1. They should only be allowed to move where it is possible to move.
2. Can you talk to them?
3. Can you order them to do things for you?
4. Can they do things that you are not able to do?

Let's take these points one at a time.

Really, the various characters should only be allowed to move around if it is possible. For instance, it is not very good programming if one character moves East, but when you try the same your way is blocked by a wall. Unless of course, there is a secret passage and door in the wall which you know nothing about, but the other person does.

Categorically, you should always be able to talk to the other people in the game, after all, they are people. So how does the game know if you are talking to another person or just giving a command to the game itself? The easiest way would be to input speech by typing something like "SAY TO HARRY GET THE SWORD." All you have to do is check the first word of each input for the word "SAY". If this word is found then the third word is checked to see who you are talking to, then all of the words after this are checked to see just what you have said to that person.

The third consideration on the list can probably be answered yes as well, although you could have people walking around who can only answer your questions. Ask the right question and you will get the right answer to solve the game. But

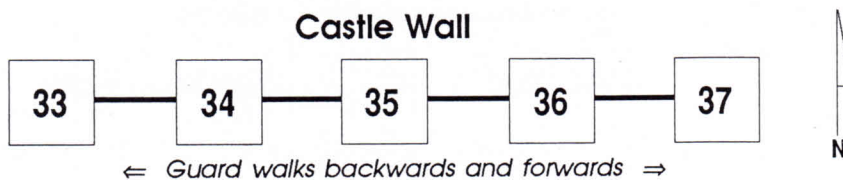


FIGURE 1

Figure 1 shows a map of the wall; this is a fairly normal way of mapping out a game.

The guard will start at location 33, walk along the wall to location 37 and then turn around and walk back again. Once back he will start all over again. He will do this for the entire game or until something

you could put the lines in after your main INPUT command or routine, so that the guard moves every time a command is input.

To see if you are in the same place as the guard you merely check your position against the guard's position (variable gp).

If the guard is killed you would

if you are ordering the other people to do things for you then you must keep a record of this in the game, until the task that you have set for that person is completed.

The last item on the list follows on from the previous one. If you can order the other people to do things, you could consider making certain problems in the game impossible for you to do, but possible for one of the others to do. Therefore, in order to finish the game you must order one of the other people to do something.

Now back to our game with the two friends moving around. It would be a little difficult to write the program for you, as everybody writes programs differently, so I will just outline what may be required in the subroutine.

Firstly, check to see if the character is performing some task for you. If so, then perform the next part of that task. Next, check to see if the character will move this time. This could be done with an RND statement.

If the character is going to move, choose a direction. Now check to see if it is possible to move in the chosen direction; if not, you can

either choose another direction or ignore the move. If you have more than one character you can use a FOR-NEXT loop to check each character.

In our game we said that it was not possible for the other two people to be killed, but if you decide that the people in your game can be killed then you must of course check to see if they are alive or dead at the beginning of the subroutine. You could access the subroutine by either of the two ways that we discussed earlier with the guard routine.

That's about it for this month but we will look into this subject further in coming months, as we have only really touched the surface in this article.

Now for a couple of items of interest from James Green: people who use the adventure contact list may notice that he is back on the list after a short break. Or as James puts it: "TO RE-INTRODUCE MY ILLUSTRIOUS NAME TO THE PLACE IT DESERVES, TOP OF THE CONTACT LIST."

James has also offered us some hint sheets. So, yes James, please send them in for us to look at. This goes for everyone out there in

adventure land - please send us any info on games that you think might be of interest to other adventurers. Last of all James would like to thank everyone who has written to him and to congratulate Mrs. Tess Dasey (I think that is the right name. James' handwriting is not good at this point of the letter) of Armidale on her completion of T & M Trilogy. Well done, Tess.

That's it for this month, I will see you next month with more. Please send in your questions and answers, as we don't have too many this month. Bye for now.

QUESTIONS

Here we go for another month and the first question is from Chris Maloney. He is stuck in the fifth level of Ultima V; he has nearly completed the game but is stuck in the dungeon room which is found in the underworld.

Matthew Power-Thornton would like to know what the horseshoe magnet is used for in Dizzy. He has tried almost everything but still cannot find a use for it.

Sorry, no answers for this month!

ADVENTURER'S CONTACT LIST

(Please don't abuse the help being offered)

Kenny Thomas
35 Doreen Street
Christchurch 7 NZ

Adventure Quest, Aftershock, Enchanter, Warlord, Escape from Khoshima, Sorcerer, Haunted House, Imagination, The Mural, Kaiser, Knight Tyme, Kobyashi Naru, The Never Ending Story, Snowball, Questprobe III, Necris Dome, Mindshadow, Mordon's Quest, Seabase Delta, Message fr. Andromeda, Rigel's Revenge

James S. Green
1003 Botany Road
Mascot NSW 2020

Never Ending Story, The Hobbit, LOR pt I, Time & Magik Trilogy

David Elliott
2 Selina Court
Frankston Vic 3199

Mindfighter, Hacker, Realm, Mindshadow, Bastow Manor, The Experience, Imagination

Kenneth J Philliponi
61 Bringelly Road
Kingswood NSW 2750
Secret Of Bastow Manor

Chris Maloney
20 Helena Court
RYE Vic 3941

CPC: Bard's Tale
PC: Bard's Tale, King's Quest I, II, III, IIII, Police Quest I, II, Space Quest I,II, III, Leisure Suit Larry I, II, Mixed up in Mother Goose, The Black Cauldron, Demon's Forge, Hitch-Hiker's Guide to the Galaxy, Zak McCracken and the Alien Minbenders, Manhunter (New York), Phantasie I, III

Jeff Tremain
P.O. BOX 92
North Quay Qld 4002

The Pawn, Guild of Thieves, Jinxter

Jason Pavy
105 Lyall St. Kalgoorlie
W.A. 6430

The Hobbit, Forest at Worlds End

Rhondda Cook
PO BOX 418
Gatton Qld 4343

Time Search, Trials of Arnold Blackwood, Arnold goes Somewhere Else, Castle Dracula,

Mountain Palace Adventure

Steve & Robyn Ballard
126 Lyndhurst Road
Boondall, Qld 4034

Warload, The Experience, Escape, Forest at World's End, Phoenix Mission, Message from Andromeda, Heroes of Karn, Jewels of Babylon

Karla Slack
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Springwood NSW 2777

Adventure Quest , The Hobbit, Zork II ,The Neverending Story (1) Wishbringer

John McNeill
1 Hawkins St.
Chatswood Hills, Qld 4127

Jewels of Babylon, The Trials of Arnold Blackwood

Dean Stibbe
25 South Esplanade
Bribie Island Qld 4507

Seabase Delta, The Trials of Arnold Blackwood, Colossal Adventure, Dracula (pts1&2)

Michael Fitzgerald
54 View Road
Burnie Tasmania 7320

The Hobbit, The Neverending Story

John Hall
28 Werribee Street
Broadmeadows, Vic 3047
Forest Land

Dave Weatherhead
2 Searle Court
Nth. Dandenong Vic 3175

Aftershock, Imagination, Seabase Delta, Necris Dome

Mark Nelson
128 Parkin Street
Rockingham. WA 6168

Enchanter, Gremlins, Infidel, Midshadow, Message from Andromeda, Wishbringer, Heavy on the Magik.

John Dawson
RSD 557,
Cygnet Tasmania 7112

Ground Zero, Curse of Sherwood, Pyjamarama, Down

the Mine, Warlock, Exchange, Castle Dracula, Time Search, Subsunk, Mountain Palace Adventure, Mayday, Sorcery+, Aftershock, Knight-Tyme, Zorro, Adventure Quest, Time & Magik Trilogy.

Scott Barker
88 Elsie Goe,
Chelsea VIC. 3196

The Hobbit, Jewels of Babylon, Imagination, Mordon's Quest

Bobby Lockett
5 Wendy Place
Prospect. Tasmania. 7250.

The Hobbit, Zork I, Enchanter, Tau Ceti, Sorcerer, Planetfall, The Wild Bunch, Mordons Quest, Knight Tyme, Jewels of Babylon, Seabase Delta, Forest At Woods End, Neverending Story, Swords and Sorcery, Bugsy, Jack The Nipper, Academy, Message From Andromeda, Leather Goddesses of Phobos, Everyone's a Wally, Pyjamarama, The Boggit, Robin of Sherwood, Sorcery+, Shogun.

FANTASTIC ADVENTURE

Barrie Eaton has done well to create this fantasy adventure, and you'll be doing well to type it in correctly! Here's the second of three parts...

```

790 IF posi%=136 AND ag=1 AND (ah<>1 OR aj<>1 OR aq<>1)
  THEN PRINT"you have entered before him without all the
  objects.He is greatly displeased andwith a wave of his
  hand sends you      hurtling back to the earth.":PRIN
  T:posi%=25
800 IF posi%=136 AND ag=1 AND ah=1 AND aj=1 AND aq=1 TH
  EN GOTO 3650
810 IF posi%=19 AND av<>1 THEN PRINT"with a vicious sna
  rl it pounces upon youand devours you.You become one mo
  re of its victims.":PRINT:GOSUB 3580
820 IF posi%=74 AND ze=1 THEN loca$(74)="in the realm o
  f the troll king":PRINT"as you have already visited thi
  s place and survived you are granted immunity":posi%=1
  04
830 IF posi%=74 AND az<>1 AND ze<>1 THEN PRINT"you don,
  t have the protective charm.You go straight to hell!":P
  RINT:posi%=75
840 IF posi%=131 AND as=2 THEN PRINT"since you have gai
  ned access already youmay continue.":PRINT:posi%=132
850 IF posi%=131 AND as<>1 THEN PRINT"you are not carry
  ing the right object. You feel yourself plummeting do
  wn a vortex back towards the earth.":PRINT:posi%=25
860 kk=0
870 a$="":IF loca%(posi%,1)>0 THEN a$="North"
880 IF loca%(posi%,2)>0 AND LEN(a$)>0 THEN a$=a$+",Sout
  h" ELSE IF loca%(posi%,2)>0 THEN a$="South"
890 IF loca%(posi%,3)>0 AND LEN(a$)>0 THEN a$=a$+",East
  " ELSE IF loca%(posi%,3)>0 THEN a$="East"
900 IF loca%(posi%,4)>0 AND LEN(a$)>0 THEN a$=a$+",West
  " ELSE IF loca%(posi%,4)>0 THEN a$="West"
910 IF LEN(a$)=0 THEN a$="Nowhere at all!"
920 PRINT:PRINT:PEN 3:PRINT"you can go:- ":PEN 2:PRINT
  a$
930 e=0
940 FOR x=1 TO 26:pp%=0:IF obj$(x)=posi% THEN pp%=1
950 IF pp%=1 THEN 970
960 NEXT:GOTO 1000
970 IF e=0 THEN PRINT:PRINT:PEN 3:PRINT"you can see:- "
980 PEN 2:PRINT obj$(x):e=e+1
990 GOTO 960
1000 PEN 1:PRINT:PRINT:PRINT"what do you wish to do now
?":PRINT:INPUT "",z$
1010 z$=LOWER$(z$):y$=LEFT$(z$,2):x$=LEFT$(z$,3):w$=LEF
  T$(z$,4):o$=LEFT$(z$,5):q$=LEFT$(z$,6):p$=LEFT$(z$,7):r
  $=LEFT$(z$,8):u$=RIGHT$(z$,9):t$=RIGHT$(z$,10)
1020 CLS
1030 IF (y$="n" OR w$="go n") AND loca%(posi%,1)<>0 THE
  N kk=1:posi%=loca%(posi%,1)
1040 IF (y$="s" OR w$="go s") AND loca%(posi%,2)<>0 THE
  N kk=1:posi%=loca%(posi%,2)
1050 IF (y$="e" OR w$="go e") AND loca%(posi%,3)<>0 THE
  N kk=1:posi%=loca%(posi%,3)
1060 IF (y$="w" OR w$="go w") AND loca%(posi%,4)<>0 THE
  N kk=1:posi%=loca%(posi%,4)
1070 IF kk=0 AND (y$="n" OR y$="s" OR y$="e" OR y$="w")
  THEN kk=1:PRINT"you can't go in that direction":PRINT
1080 IF kk=0 AND (w$="go n" OR w$="go s" OR w$="go e" O
  R w$="go w") THEN kk=1:PRINT"you can't go in that direc
  tion":PRINT
1090 IF p$="get key" THEN PRINT"which key?":PRINT
1100 IF x$="get" OR w$="take" THEN kk=1:GOSUB 1500
1110 IF y$="i" THEN kk=1:GOSUB 1840
1120 IF r$="drop key" THEN PRINT"which key?":PRINT:GOTO
  1140
1130 IF w$="drop" OR w$="leav" THEN kk=1:GOSUB 1880
1140 IF w$="forc" OR w$="leve" THEN kk=1:GOSUB 2150
1150 IF o$="unlo " OR q$="unloc " OR p$="unlock " THEN
  kk=1:GOSUB 2190 ELSE IF w$="unlo" THEN GOTO 1430
1160 IF o$="clim " OR q$="climb " THEN kk=1:GOSUB 2350
  ELSE IF w$="clim" THEN GOTO 1430
1170 IF o$="span " OR w$="lay " THEN kk=1:GOSUB 2400 EL
  SE IF w$="span" OR x$="lay" THEN GOTO 1430
1180 IF x$="sco" OR w$="scor" OR o$="score" THEN kk=1:G
  OSUB 2300
1190 IF o$="clea " OR q$="clear " OR o$="move " THEN kk
  =1:GOSUB 2500 ELSE IF w$="clea" OR w$="move" THEN GOTO
  1430
1200 IF p$="tie noo" OR r$="tie noos" OR u$="tie noose"
  OR r$="make las" OR u$="make lass" OR t$="make lasso"
  THEN kk=1:GOSUB 2400
1210 IF w$="ask " THEN kk=1:GOSUB 2670 ELSE IF x$="ask"
  THEN GOTO 1430
1220 IF w$="swin" THEN kk=1:GOSUB 2470
1230 IF w$="eden" OR r$="say eden" OR u$="call eden" TH
  EN kk=1:GOSUB 2940
1240 IF o$="thro " OR q$="throw " THEN kk=1:GOSUB 2430
  ELSE IF o$="throw" THEN GOTO 1430
1250 IF o$="kill " THEN kk=1:GOSUB 2540 ELSE IF w$="kil
  l" THEN GOTO 1430
1260 IF w$="swal" THEN kk=1:GOSUB 2270

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1270 IF w$="oops" THEN kk=1:GOSUB 3330
1280 IF w$="zalb" OR r$="call zel" OR u$="call zalb" OR
    t$="call zelba" THEN kk=1:GOSUB 2320
1290 IF o$="jump " THEN kk=1:GOSUB 2730 ELSE IF w$="jum
p" THEN GOTO 1430
1300 IF o$="give " THEN kk=1:GOSUB 2800 ELSE IF w$="giv
e" THEN GOTO 1430
1310 IF w$="row " OR o$="sail " THEN kk=1:GOSUB 2960 EL
SE IF x$="row" OR w$="sail" THEN GOTO 1430
1320 IF o$="turn " THEN kk=1:GOSUB 3030 ELSE IF w$="tur
n" THEN GOTO 1430
1330 IF o$="show " THEN kk=1:GOSUB 2920 ELSE IF w$="sho
w" THEN GOTO 1430
1340 IF o$="exam " OR q$="exami " OR p$="examin " OR r$
="examine " THEN kk=1:GOSUB 3120 ELSE IF w$="exam" THEN
GOTO 1430
1350 IF w$="quit" THEN kk=1:GOSUB 3380
1360 IF o$="push " THEN kk=1:GOSUB 3000 ELSE IF w$="pus
h" THEN GOTO 1430
1370 IF o$="open " THEN kk=1:GOSUB 3450 ELSE IF w$="ope
n" THEN GOTO 1430
1380 IF w$="drin" THEN kk=1:GOSUB 3490
1390 IF w$="swim" THEN kk=1:GOSUB 3530
1400 IF w$="save" THEN kk=1:GOSUB 3700
1410 IF w$="load" THEN kk=1:GOSUB 3850
1420 IF kk=0 THEN PRINT"I don't understand what you mea
n by ";PEN 2:PRINT z$:PRINT:GOTO 1440
1430 IF kk=0 THEN PRINT"Please be more specific":PRINT
1440 WEND
1450 IF r=0 THEN GOTO 1460 ELSE IF LOWER$(RIGHT$(z$,3))
=" it" THEN RETURN
1460 l$="":FOR x=1 TO LEN(z$):IF MID$(z$,x,1)=" " THEN
l$=RIGHT$(z$,LEN(z$)-x):x=200
1470 NEXT:r=0:l%=0:IF LEN(l$)<3 THEN RETURN
1480 FOR x=1 TO 40:IF LEFT$(get$(x),LEN(l$))=l$ THEN l%
=1:r=x
1490 NEXT:RETURN
1500 GOSUB 1450:IF l%=1 THEN 1530
1510 PRINT"You Can't!":PRINT:RETURN
1520 RETURN
1530 e%=0:FOR x=1 TO 26:IF obj$(x)=posi% AND obj$(get$(
r))=posi% THEN e%=1
1540 NEXT:IF e%=0 THEN RETURN
1550 FOR x=1 TO 6:IF inv$(x)="" THEN x=10:GOTO 1570
1560 NEXT:PRINT"Your hands are full!":PRINT:RETURN
1570 IF r=1 OR r=2 THEN ab=1
1580 IF r=3 OR r=4 THEN ac=1:PRINT"A worthy companion":
PRINT
1590 IF r=5 THEN ad=1
1600 IF r=6 THEN ae=1
1610 IF r=7 THEN af=1
1620 IF r=8 OR r=9 THEN ag=1
1630 IF r=10 OR r=11 THEN ah=1
1640 IF (r=12 OR r=13) AND zm=1 THEN GOSUB 3060 ELSE IF
    zm=0 THEN ai=1
1650 IF r=15 THEN aj=1
1660 IF r=17 THEN ak=1
1670 IF r=20 THEN am=1
1680 IF r=21 THEN an=1
1690 IF r=22 THEN ao=1
1700 IF r=23 THEN ap=1
1710 IF r=25 THEN aq=1
1720 IF r=26 THEN ar=1
1730 IF r=27 OR r=28 THEN as=1
1740 IF r=31 THEN av=1
1750 IF r=32 OR r=33 THEN aw=1
1760 IF (r=34 OR r=35) AND zn=1 THEN GOSUB 3070 ELSE IF
    zn=0 THEN ax=1
1770 IF r=36 OR r=37 THEN ay=1
1780 IF r=38 THEN az=1
1790 IF r=39 OR r=40 THEN ba=1
1800 IF r=18 OR r=19 OR r=29 OR r=30 THEN PRINT"Don't b
e absurd":PRINT:RETURN
1810 e%=0:FOR x=1 TO 6:IF inv$(x)="" THEN inv$(x)=obj$(
get$(r)):e%=1:x=10
1820 NEXT:IF e%=0 THEN PRINT"Your hands are full!":PRIN
T:RETURN
1830 obj$(get$(r))=0:a%=a%+1:PRINT CHR$(7):RETURN
1840 PEN 3:f%=0:PRINT"You are carrying :-"
1850 FOR x=1 TO 6:IF inv$(x)<>"" THEN PEN 2:PRINT inv$(
x):f%=1
1860 NEXT:PRINT:IF f%=0 THEN PEN 2:PRINT"nothing at all
!":PRINT
1870 PRINT:RETURN
1880 GOSUB 1450:e%=0:FOR x=1 TO 6:IF inv$(x)=obj$(get$(
r)) THEN inv$(x)="" :e%=1:a%=a%-1
1890 NEXT:IF e%<>1 THEN PEN 2:PRINT"You are not carryin
g a ";l$:PRINT:RETURN
1900 IF r=1 OR r=2 THEN ab=0
1910 IF r=3 OR r=4 THEN ac=0
1920 IF r=5 THEN ad=0
1930 IF r=6 THEN ae=0
1940 IF r=7 THEN af=0
1950 IF r=8 OR r=9 THEN ag=0
1960 IF r=11 THEN ah=0
1970 IF r=12 OR r=13 THEN ai=0
1980 IF r=14 OR r=15 THEN aj=0
1990 IF r=16 OR r=17 THEN ak=0
2000 IF r=20 THEN am=0
2010 IF r=21 THEN an=0
2020 IF r=22 THEN ao=0
2030 IF r=23 THEN ap=0
2040 IF r=24 OR r=25 THEN aq=0
2050 IF r=26 THEN ar=0
2060 IF r=27 OR r=28 THEN GOSUB 3100
2070 IF r=31 THEN av=0

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2080 IF r=32 OR r=33 THEN aw=0
2090 IF r=34 OR r=35 THEN ax=0
2100 IF r=36 OR r=37 THEN ay=0
2110 IF r=38 THEN az=0
2120 IF r=39 OR r=40 THEN ba=0
2130 obj%(get%(r))=posi%
2140 RETURN
2150 IF posi%=46 AND ak=1 THEN PRINT"The door creaks op
en.":loca%(posi%,4)=47:sc=sc+10:PRINT:RETURN
2160 IF posi%=46 AND ak<>1 THEN PRINT"You need the righ
t object first.":PRINT:RETURN
2170 IF posi%<>46 THEN PRINT"You Can't!":PRINT:RETURN
2180 RETURN
2190 IF posi%=11 AND ab=1 THEN PRINT"You unlock the doo
r":loca%(posi%,1)=12:sc=sc+10:PRINT:RETURN ELSE IF posi
%=11 AND ab=0 THEN GOTO 2250
2200 IF posi%=30 AND ai=1 THEN PRINT"You unlock the doo
r":loca%(posi%,1)=31:sc=sc+30:PRINT:RETURN ELSE IF posi
%=30 AND ai=0 THEN GOTO 2250
2210 IF posi%=48 AND aw=1 THEN PRINT"You unlock the doo
r":loca%(posi%,3)=49:sc=sc+30:PRINT:RETURN ELSE IF posi
%=48 AND aw=0 THEN GOTO 2250
2220 IF posi%=107 AND ax=1 THEN PRINT"You unlock the do
or":loca%(posi%,3)=108:sc=sc+30:PRINT:RETURN ELSE IF po
si%=107 AND ax=0 THEN GOTO 2250
2230 IF posi%=94 AND ay=1 THEN PRINT"You unlock the doo
r":loca%(posi%,2)=95:sc=sc+20:PRINT:RETURN ELSE IF posi
%=94 AND ay=0 THEN GOTO 2250
2240 IF posi%=63 AND ba=1 THEN PRINT"You unlock the che
st and open it.You have found something!":obj%(9)=63:
sc=sc+30:PRINT:RETURN ELSE IF posi%=63 AND ba=0 THEN GO
TO 2250
2250 IF posi%=46 OR posi%=62 THEN PRINT"You Can't!":PRI
NT ELSE PRINT"You don't have the key":PRINT:RETURN
2260 RETURN
2270 IF posi%<>111 THEN PRINT"It has no effect here.":P
RINT:RETURN
2280 IF posi%=111 AND ar=1 THEN PRINT"You rise upwards
to the top of the shaft":posi%=112:PRINT:GOSUB 4310
2290 RETURN
2300 PRINT:PEN 3:PRINT"You have scored";sc;"points out
of 300":PRINT:RETURN
2310 RETURN
2320 IF ag=1 AND (posi%=31 OR posi%=42 OR posi%=75) THE
N PRINT"You feel yourself being whisked away to another
place.You have been saved.":bz=0:posi%=25:PRINT:RETURN
2330 IF ag=1 AND (posi%<>31 OR posi%<>42 OR posi%<>75)
THEN PRINT"It has no effect here!":PRINT:RETURN
2340 RETURN
2350 IF posi%=78 THEN PRINT"O.K!":PRINT:posi%=81:RETURN
2360 IF posi%=81 THEN PRINT"O.K!":PRINT:posi%=78:RETURN
2370 IF posi%=52 OR posi%=53 OR posi%=76 OR posi%=77 TH
EN PRINT"O.K!":PRINT:RETURN
2380 PRINT"You Can't!":PRINT:RETURN
2390 RETURN
2400 GOSUB 1450
2410 IF an=1 THEN PRINT"O.K!":an=2:PRINT:RETURN
2420 RETURN
2430 IF posi%=96 AND an=1 THEN PRINT"O.K! It hits the s
talactite and falls down the hole.It is just as well
you were holding the other end":PRINT:RETURN
2440 IF posi%=96 AND an=2 THEN PRINT"O.K! It is in posi
tion":PRINT:loca$(96)="at the edge of a wide pit.A rope
danglesdown over the hole":sc=sc+10:GOTO 4250
2450 PRINT"You Can't!":PRINT:RETURN
2460 RETURN
2470 IF posi%=96 AND an=3 THEN PRINT"O.K!":posi%=97:PRI
NT:RETURN
2480 IF posi%=97 AND an=3 THEN PRINT"O.K!":posi%=96:PRI
NT:RETURN
2490 RETURN
2500 IF posi%=83 AND ak=1 THEN PRINT"Good! You are now
able to go through.":PRINT:loca%(posi%,2)=84:loca$(83)
="on a narrow path in the cave going through a nar
row neck of rock":sc=sc+10:RETURN
2510 IF posi%=83 AND ak<>1 THEN PRINT"You don't have th
e right tool.":PRINT:RETURN
2520 IF posi%<>83 THEN PRINT"You Can't!":PRINT:RETURN
2530 RETURN
2540 IF posi%=56 AND ae=1 THEN PRINT"O.K! You strike hi
m down and kill him. However men at arms set upon you
in retaliation and strike you down also.":PRINT:GOS
UB 3580
2550 IF posi%=56 AND ae<>1 THEN PRINT"You have no weapo
n to kill him with.":PRINT:RETURN
2560 IF posi%=19 AND ae<>1 THEN PRINT"You have nothing
to kill it with.":PRINT:RETURN
2570 IF posi%=19 AND ae=1 THEN PRINT"You can't! It is i
nvincible.":PRINT:RETURN
2580 IF posi%=72 AND ae=1 AND zo=0 THEN PRINT"You kill
her with your sword.":PRINT:loca$(72)="at the witches h
aunt.Berylda the witch lies on the ground dead.":zo=1:
PRINT:RETURN
2590 IF (posi%=24 OR posi%=74 OR posi%=134) AND ae=1 TH
EN PRINT"You Can't! He is protected by magic.":PRINT:RE
TURN
2600 IF posi%=117 AND ae=1 THEN PRINT"You Can't! She is
protected by magic.":PRINT:RETURN
2610 IF (posi%=1 OR posi%=6 OR posi%=80 OR posi%=103) A
ND ae=1 THEN PRINT"What For! Don't be so bloodthirsty":
PRINT:RETURN

```

Take a break here and put your fingers in a bucket of ice-water to cool them down; we'll be back next month with the last section of code to complete this monster!

FOR SALE

cd DRAW CAD type drafting on PCW 8256/8512. Produces accurate scale drawings in 2D, 3D or isometric using standard printer. Set scales to any value. Print text anywhere on screen. For descriptive brochure and examples contact cdSYSTEMS Aust. (03) 762 9439 a/h

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WANTED

JUNIOR SALES ASSISTANT - Tim, the manager of The Amstrad User Shop, is

CONTRIBUTIONS

We accept unsolicited articles or program contributions from readers with a view to possible publication, but in the case of programs we must insist that the coding is submitted on either tape or disc. We just do not have the time to key them all in. The tape or disc will be returned if originally accompanied with a stamped and return addressed padded bag.

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looking for a motivated person to be involved in the sale of computer hardware and software. Some familiarity with Amstrads and/or IBM-compatibles is expected. Apply in writing to: The Manager, The Amstrad User Shop, 641 High Street Rd, Mount Waverley, 3149.

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This section of the magazine offers you the chance to speak directly to the huge waiting world of Amstrad owners - or would-be owners.

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CPC & PCW PUBLIC DOMAIN SOFTWARE

The following discs contain compilations of public domain programs put together by the Advantage Computer User Group (in England) and which have been tested under CP/M Plus.

Unless otherwise stated, programs will run on the PCW, 6128 and 464/664 with extra memory and CP/M Plus. Programs for the 464/664 are on the CP/M 2.2 Collection. The discs are supplied in

Data format and contain documentation files to help the user get started and provide instructions on running the programs plus useful sorted directory and MENU systems.

But remember, as Public Domain programs they are supplied on an as-is basis.

CP/M 2.2 COLLECTION

For 464/664 disc drive users with CP/M 2.2. Contains File Manager, Compare, Find, Disc sector editor, Key definer, Bad sector eliminator, Grep, Full Screen text editor, Easy lister, File transfer utility, Unerase erased files, erased files catalogue and many more.

CPC Ref: #430

FULL SCREEN TEXT EDITOR

This machine code editor offers full screen editing, full block operations, windowing, automatic horizontal scroll (line length up to 255 characters), macro functions, word-wrap and formatting, pagination, find/replace, undelete and many user options.

The editor, which is less than 10k in size, is fast because it edits a file entirely in memory. It produces ASCII text files and has enough features to be used as a word processor. A comprehensive on-disc manual is included together with keyboard configuration files for the CPC and PCW.

CPC Ref: #601 PCW Ref: #801

DATABASE

A small relational database suitable for storing simple data and producing reports and forms letters from the data. Offers free format query language with macros and commands plus on-line help. The disc also contains an Inventory Database. Whilst these databases provide a useful introduction and you can use them to set up a full operational database system they are not meant to replace commercial packages for professional or business use.

CPC Ref: #602 PCW Ref: #802

COMMUNICATIONS

Programs to allow data transfer between computers (local and remote), access databases and bulletin boards. UKModem7, New Kermit, MEX and various communications utilities. The disc also contains software for Prestel (Viatel) emulation (PCW only).

CPC Ref: #603 PCW Ref: #803

VIDEO CLERK

Keep track of your video collection. With four Sort options and Forms Management system for printing out the data in order of title number, video number, global alphabetic or unique. Includes extensive on-disc documentation.

CPC Ref: #604 PCW Ref: #804

FIXED ASSETS LOG

Allows you to keep a record of all your assets and their value. For example, at home, you may wish to

keep a record of how much money you are spending on your computer or the value of a stamp collection etc. In business you can use it to keep a record of how much money you have tied up in land, buildings, office equipment, cars etc. It can also be used as a stock-taking program.

CPC Ref: #605 PCW Ref: #805

COMPLETE UTILITIES

• *Newsweep* - one key erase, copy, rename and print, plus many other features. Ideal for sorting out your disc collection quickly and efficiently • *Superzap* - disc sector editor - edit by track/sector or filename. Fully menu-driven with cursor key SETKEYS file • *DisckitA* - multi-choice disc formatter, offers 178k data format for PCW discs and 5.25" second drive formatting • *Unerase* erased files • *Read/write* PCW discs on a CPC • *CP/Mv2.2 emulator* • *Make* - allows you to copy files across user areas • *Cleanup* - useful for speedy file deletion • *Lookat* - speedily lists any file in Hex and ASCII • *Screen Dump* (CPC only) • *Password* • *Easy Lister* • *Password Protection* • *File* • *Scrambler* • *File Splitter* • *Directory check*

CPC Ref: #606 PCW Ref: #806

TEXT PROCESSING UTILITIES

• *Sideways* - prints text file sideways on an Epson-compatible printer. Ideal for those wide spreadsheets • *Sort* any ASCII list into alphabetical order • *Word count* - can be used on any ASCII file • *WSClean* - removes higher order bits from a text file and converts it to straight ASCII • *Calendar Generator* - prints out calendar for any year • *Simple Spell Checker* - with starter dictionary and dictionary editor • *Scoring card generator* • *Banner printers* • *Typewriter emulator*

CPC Ref: #607 PCW Ref: #807

DISC ORGANISATION

Catalogue your disc collection and produce a printed index. Useful for speedy location of files and for keeping your discs in order. Library utilities for archiving and saving disc space. File dating system. Squeeze and unsqueeze for saving up to 40% disc space. Menu system - allows menu-driven access to programs on a disc. Completely and easily user-definable.

CPC Ref: #608 PCW Ref: #808

Z80 PROGRAMMER

A complete Z80 Assembler which is capable of converting an ASCII assembler file into a fully executable machine code COM program. Plus Z80 Disassembler, Z80 Debugger, Z80 Library, 8080 Disassembler, Z80 to 8080 Translator and associated utilities.

CPC Ref: #609 PCW Ref: #809

'C' PROGRAMMER

The Small 'C' Compiler by Mike Bernson. Includes source code and 25k of documentation. Produces executable .COM programs.

CPC Ref: #610 PCW Ref: #810

'C' TOOLBOX

A disc full of 'C' source code examples together with the corresponding executable .COM programs. Useful to those wishing to see some practical examples of 'C'. As a bonus, the programs are quite useful too. The 'C' source was written for a variety of compilers and may need modifying to compile on MIX or Small 'C'.

CPC Ref: #611 PCW Ref: #811

FORTH, STOIC AND 'C' INTERPRETER

For experimenters interested in using these languages. Documentation is included on disc.

CPC Ref: #612 PCW Ref: #812

GAMES COMPENDIUM

A varied selection of the best machine code programs available for CP/M. Includes Pacman, Snake (PCW only), Chess, Othello, Mastermind, Spellit, Awari, Life, Golf, Polish Pong, Maze, Bio-rhythms, Word Search puzzle maker, TicTacTo.

CPC Ref: #613 PCW Ref: #813

ADVENTURES

• *Colossal Cave Adventure* which originated on main frame computers. With game save and re-load • *Bestiary* (written in Mallard Basic for either PCW or 6128 Mallard users. Standard CPC users see *Adventurer's Attic March 1989*) - you play the part of a young prince, your greatest love being to read the ancient bestiaries about strange and often legendary animals. Your task is to find a solution to the terrible blight which, one year, destroys both crops and animals in the kingdom. Includes game save and re-load • *Return from Arg* - a short but interesting new adventure written in 'C'.

CPC Ref: #614 PCW Ref: #814

PCW GRAPHICS (PCW only)

Simple user-designed graphics drawing program. Enables you to create, save, edit and print pictures on your PCW. Plot lines, points, boxes, four fill patterns, easy to use and wholly interactive • *PCW Screen Font designer* with several ready-to-run font sets • *Biomorph* - fascinating, graphic demonstration of natural selection - develop your own bugs! • *Readme* - program to display any ASCII text file in 45 character format on the 90 character screen - makes it easier to read.

PCW Ref: #815

HOW TO ORDER YOUR DISCS

You may either order over the phone by credit card or by post. *It is very important that you get the reference number correct. CPC and PCW discs are different.* (Software contained on 3" discs only).

The cost per disc is \$17.50. • **BANKCARD, MASTERCARD & VISA accepted** •

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1. For all book orders over \$20 please add \$5.00 (overseas \$10.00). All other orders are currently supplied post free (overseas add \$5.00).
2. When ordering by mail, if possible, always quote one or two alternatives. Otherwise call us first to check availability.
3. Most orders can be reserved for up to 7 days pending payment after which they will be released for others to buy.
4. This list is prepared some 4 weeks before publication and reflects the stock holding at that time and anticipated releases advised by producers. The latter are often optimistic.

Please allow 14 - 21 days for receipt of goods.

Amstrad CPC Range 464, 664 and 6128 (unless otherwise stated)

CPC GAMES

	Discs	Tapes					
3-D Pool	39.95	29.95	Cyberoid	44.95	-	Lancelot	49.95 39.95
4x4 Off-Road Racing	39.95	29.95	Dark Fusion	44.95	29.95	Last Duel	- 29.95
500cc Grand Prix	32.95	24.95	Darkside	44.95	29.95	Last Ninja 2	44.95 29.95
1942	24.95	19.95	Deep, The	39.95	29.95	LED Storm	44.95 29.95
1943	44.95	29.95	Desolator	44.95	29.95	Live and Let Die	39.95 29.95
Academy (Tau Ceti 2)	49.95	-	Dominator	39.95	29.95	Living Daylights	49.95 32.95
Acrojet	49.95	39.95	Double Dragon	49.95	-	Mad Mix - Pepsi Challenge	44.95 29.95
Adventure 4-Pack	32.95	27.95	Dragon Ninja	44.95	29.95	Mach 3	32.95 24.95
After Burner	44.95	29.95	Driller	44.95	29.95	Major Motion	44.95 29.95
Airborne Ranger	44.95	-	Echelon	44.95	29.95	Mercenary Compend. (2 games)	29.95 19.95
Andy Capp	-	29.99	Eddie Edward's Super Ski	39.95	29.95	Mega Apocalypse	34.95 34.95
Artura	44.95	29.95	Empire Strikes Back	49.95	34.95	Monopoly	39.75 29.00
ATF	44.95	29.95	F-15 Strike Eagle	49.95	39.95	Motor Massacre	44.95 29.95
Bad Cat	-	29.95	Fernandez must Die	44.95	29.95	New Zealand Story	39.95 29.95
Bactron	-	9.95	Flippit	29.95	24.95	Nigel Mansell's Grand Prix	49.95 35.95
Bard's Tale, The	44.95	29.95	Forgotten World	39.95	29.95	Night Raider	44.95 29.95
Basil, the Great Mouse Detective	-	29.95	Fury, The	34.95	34.95	Not a penny more...	49.95 -
Batman - The Caped Crusader	44.95	29.95	Galactic Conqueror	49.95	39.95	Operation Wolf	44.95 29.95
Bedlam	-	29.95	Game Over 2	39.95	29.95	Outrun	- 29.95
Beyond the Ice Palace	34.95	34.95	Games, The - Winter edition	35.95	29.95	Overlander	39.95 29.95
Bionic Commando	-	29.95	Garfield	44.95	29.95	Pacmania	44.95 29.95
Blasteroids	39.95	29.95	Gauntlet II	44.95	-	Pegasus Bridge	34.95 29.95
By fair means or foul	44.95	29.95	Giant Killer - maths adventure	49.95	-	PHM Pegasus	34.95 34.95
Captain Blood	49.95	39.95	Gnome Ranger	44.95	29.95	Professional 4 Soccer Simulator	34.95 24.95
Charlie Chaplin	44.95	29.95	Gm. Gooch's Cricket	29.95	-	Pro Tennis 3-D	24.95 -
Chicago 30's	39.95	29.95	Guerilla Wars	44.95	29.95	Psycho Pigs	44.95 29.95
Chubby Gristle	44.95	29.95	GunShip	59.95	49.95	Purple Saturn Day (Capt. Blood II)	39.95 29.95
Chuck Yeager's Adv. Flt. Trainer	54.95	45.95	H.A.T.E.	39.95	29.95	Raffles	39.95 26.95
Classic Quest Adventures:			Head over Heels	-	29.95	Rambo III	44.95 29.95
Goblin Towers (mod.)	49.95	-	High Steel	39.95	-	Real Ghostbusters	39.95 29.95
Forestland (hard)	49.95	-	Hopping Mad	34.95	34.95	Red Heat	39.95 29.95
Witch Hunt (very hard)	49.95	-	Hot Shot	37.95	29.95	Renegade 3	39.95 29.95
Cluedo	39.95	29.00	Human Killing Machine	39.95	29.95	Return of the Jedi	- 29.95
Corruption (6128s only)	59.95	-	Hunt for Red October	-	39.99	Robocop	44.95 29.95
Crazy Cars 2	49.95	34.95	Impact	49.95	-	Rodeo Games	39.95 -
			Impossible Mission II	39.95	29.95	Rolling Thunder	- 29.95
			Incredible Shrinking Sphere	44.95	29.95	Roy of the Rovers	44.95 29.95
			Ingrid's Back	49.95	34.95	R-Type	44.95 29.95
			Inside Outing	44.95	29.95	Running Man	39.95 29.95
			Iron Lord	49.95	39.95	Run the Gauntlet	39.95 29.95
			Jack the Ripper	44.95	29.95	Sapiens	39.95 29.95
			Jaws	39.95	-	Savage	39.95 29.95
			Knight Orc	49.95	34.95	Scalextric	- 29.00

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Comprehensive catalogue of Entertainment and Business Software, Books, Add-ons and Consumables for Amstrad computers.

CPC - continued

Scrabble de luxe (6128)	44.95	-
Scrabble (standard)	39.75	29.00
SDI	39.95	29.95
Silk Worm	49.95	-
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Slaine	35.95	-
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Sorcerer Lord	44.95	29.95
Space Racer (Space jet bikes)	32.95	-
Star Wars	49.95	35.95
Storm Lord	36.95	-
Street Fighter	44.95	29.95
Super Scramble	39.95	29.95
Technocop	44.95	29.95
Terramex	34.99	29.99
Tréris	34.99	29.99
Thunder Blade	44.95	29.95
Thunderbirds	39.95	29.95
Time Scanner	39.95	29.95
Tiger Road	-	29.95
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<i>Young Players edition</i>	-	22.95
<i>Baby Boomer edition</i>	27.95	22.95
Trivial Pursuit - a new beginning	42.95	35.95
Turbo Cup	39.95	29.95
Typhoon	44.95	29.95
Vigilante	39.95	29.95
Vindicator, The	-	29.95
Vixen, The	34.95	-
Wanderer 3-D	39.95	29.95
WEC Le Mans	44.95	29.95
Wizard Warz	44.95	29.95
World Class Leaderboard	44.95	-
Wolfman	44.95	29.95
Xybots	34.95	24.95
Yes Prime Minister	49.95	39.95

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Advanced Pinball Simulator	-	11.95
BMX Simulator	-	9.95
Core	-	12.95
Dizzy Dice/Joe Blade	22.00	-
Fruit Machine Simulator	-	9.95
Future Knight	19.95	12.95
Grand Prix Simulator	-	9.95
Jet Bike Simulator	-	21.95
Metal Army	-	12.95
Professional BMX Simulator	-	21.95
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Super Stuntman	-	9.95
Tanium	-	12.95

CPC COMPILATION PACKS

ARCADE MUSCLE

with *Bionic Commandos, Street Fighter, 1943, Side Arms and Road Blasters* 49.95 —

DALEY THOMPSON'S OLYMPIC CHALLENGE

10 Decathlon events (not 664s) 49.95 39.95

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ELITE SIX-PACK - VOL 1

with *Shockway rider, Eagle's Nest, ACE, Batty, International Karate and Lightforce* 39.95 34.95

CPC - continued

ELITE SIX-PACK - VOL 3		
with <i>The Living Daylights, Ghost 'n' Goblins, Paper Boy, Dragon's Lair, Escape from Singes Castle (on tape only) and Enduro Racer</i>	39.95	34.95
FISTS 'N' THROTTLES		
with <i>Thundercats, Ikari Warriors, Dragon's Lair, Enduro Racer and Buggy Boy</i>	39.95	34.95
FOUR SMASH HEWSON HITS		
with <i>Zynaps, Exolon, Ranarama and Uridium Plus</i>	39.95	29.95
FLIGHT ACE		
with <i>Air Traffic Control, ACE, Spitfire 40, Strike-force Harrier, Tomahawk, ATF</i>	49.95	39.95
GAME, SET AND MATCH II		
with <i>Super Hang-on, Basket Master, Ian Botham's Test Match, Championship Sprint, Steve Davies Snooker, Match Day II, Nick Faldo's Open and Track & Field events</i>	49.95	39.95
GIANTS		
with <i>Gauntlet II, Outrun, California Games, 720° and Rolling Thunder</i>	49.95	39.95
GOLD, SILVER, BRONZE		
Three discs or tapes containing <i>Summer Games 1 and 2 and Winter Games</i>	59.95	49.95
IN CROWD		
with <i>Karnov, Gryzor, Barbarian, Platoon, Combat School, Crazy Cars, Target Renegade & Predator</i>	-	39.95
KARATE ACE COMPILATION		
with <i>Exploding Fist, Bruce Lee, Kung Fu Master, Avenger, Samurai Trilogy, Uchi Mata etc.</i>	49.95	39.95
KONAMI ARCADE COLLECTION		
with <i>Shao-Lin's Road, Jail Break, Mikie, Yie Ar KungFu I and II, Hypersports, Green Beret, Nemesis, Jackal and Ping Pong</i>	49.95	39.95
LEADERBOARD PAR 3		
with <i>Leaderboard, Leaderboard Tournament, and World Class Leaderboard</i>	52.95	42.95
LIVE AMMO COMPILATION		
with <i>Green Beret, Rambo, Top Gun, Army Moves & Great Escape</i>	49.95	39.95
MAGNIFICENT SEVEN COMPILATION		
with <i>Wizball, Short Circuit, Arkanoid, Head over Heels, Great Escape, Cobra, Franki goes to Hollywood + FREE Yie Ar Kung Fu</i>	49.95	39.95
SPECIAL ACTION		
with <i>Daley Thompson's Olympic Challenge, Driller, SDI, Captain Blood and Vindicator</i>	49.95	39.95
STORY SO FAR Vol 2		
with <i>Space Harrier, Live 'n' let die, Hopping Mad, Overlander & Beyond the Ice Palace</i>	39.95	34.95
STRAIGHT SIX		
Lorciel's compilation with <i>3D Fight, Billy, Soccer, MGT, Flash and ZOXX2099</i>	29.95	19.95
SUPREME CHALLENGE		
compilation with <i>Elite, Sentinel, Tetris, ACE II and Starglider</i>	49.95	39.95
TAITO'S COIN OP HITS		
with <i>Rastan, Arkanoid 1, Arkanoid 2, Slap Fight, Bubble Bobble, Legend of Kage, Renegade and Flying Shark.</i>	-	39.95
TAU GAMES + (6128s only)		
<i>Dominoes, Snakes and Ladders, Mah-Jong, 3-D Noughts & Crosses, Trucking, Tycoon plus Graphic Designer and Sprite Designer</i>	32.95	-
TEN MEGA GAMES VOL 1		
with <i>North Start, Cybernoid, Deflektor, Triaxos, Blood Brothers, Mask 2, Tour de Force, Hercules, Blood Valley,</i>		

CPC - continued

<i>Masters of the Universe</i>	44.95	39.95
TIME AND MAGIK TRILOGY (disc for 128k only)		
<i>Lords of Time, Red Moon and Price of Magik</i>	49.95	39.95
WE ARE THE CHAMPIONS		
with <i>Renegade, Barbarian, SuperSprint, Rampage and International Karate</i>	49.95	39.95

CPC YEAR DISCS

<i>Containing all the monthly type-ins published</i>		
Year Disc 1 - Issues 1 to 12	50.00	-
Year Disc 2 - Issues 13 to 16	22.50	-
Year Disc 3 - Issues 17 to 20	25.00	-
Year Disc 4 - Issues 21 to 24	25.00	-
Year Disc 5 - Issues 25 to 28	25.00	-
Year Disc 6 - Issues 29 to 32	25.00	-
Year Disc 7 - Issues 33 to 36	25.00	-
Year Disc 8 - Issues 37 to 40	25.00	-
Year Disc 9 - Issues 41 to 44	25.00	-
Year Disc 10 - Issues 45 to 48	25.00	-
Year Disc 11 - Issues 49 to 52	25.00	-
Separate tapes for each issue's type-ins are also available : each	-	5.00

CPC SERIOUS SOFTWARE

ADVANCED ART STUDIO (Rainbird)		
Graphics package (128k only)	69.95	-
BRAINSTORM - ideas and reporting system(6128s only)	99.00	-
CARDBOX - card index system (6128s only)	129.00	-
CARDBOX PLUS - enhanced version of Cardbox (6128s only)	199.00	-
EXTRA EXTRA - a disc full of ready made graphics, fonts and clip art compatible with Stop Press	89.00	-
MASTERFILE III - the best relational database system (128k only)	109.00	-
MASTERCALC 128 - spreadsheet program for 6128s (or 464 with disc drive and expansion)	99.00	-
MATRIX - spreadsheet with text editing facilities, database, mail merging etc.	79.95	-
MINI OFFICE II - a comprehensive value package which includes six different modules enabling you to write letters, prepare reports, create computerised files, compile mailing lists, set up financial records, carry out complicated calculations, draw graphs, print out labels and communicate directly with other computers over the telephone	59.00	49.00
MONEY MANAGER - powerful cash book program	59.95	-
PERSONAL EXCELLENCE PACKAGE - High quality Mental performance analyser	109.00	-
PLAN-IT - desktop organiser	39.95	-
PRINT MASTER PLUS - create your own Banners, Letter-heads, Signs, Calendars or Greeting Cards with graphics or borders supplied.		
(Runs under CP/M Plus only)	59.95	-
PRINT MASTER ART GALLERY 1 - 140 pictures including holidays, animals, sports office etc.	50.95	-
PRINT MASTER ART GALLERY 2 - 140 pictures including ornamental letters, flags, people	50.95	-
PROTEXT - high speed w/p	89.95	-
PROTEXT FILER - pop-up database module for Protext. (Requires Promerge & Protext)	69.95	-

CPC - continued

PROTEXT OFFICE - pop-up add-ons for Protext including mailmerge and invoice generator. (Needs Promerge & Protext)	99.95	-
PROSPELL - spell checker	79.95	-
PROMERGE - mail merger	79.95	-
STOCKMARKET - monitors shares etc.	49.95	-

STOP PRESS

The ultimate Desktop Publishing package for CPC owners. Combine text and graphics with 'what you see is what you get' facilities. The ideal publishing software solution for home enthusiasts, schools, societies and small businesses. (Stop Press needs 128k)

Stop Press (disc only)	159.00	
With AMX MkIII Mouse	289.00	
Extra Extra clip art	89.00	
Mouse only	150.00	

Tasword 464	-	59.95
Tasword 464/D	69.95	-
Tasword 6128	69.95	-
Tas-spell	49.00	-
Tasprint	39.00	39.00
Tascopy	36.00	39.00
Tasdiary	39.00	-
Tas-sign	69.95	-
Touch 'n' Go - Typing tutor (6128s only)	69.00	-
Ultrabase - easy database	69.95	-

CPC EDUCATIONAL

From SCHOOL SOFTWARE

Play School (Ages 3-7)	29.95	22.95
Magic Maths (Ages 4-8)	29.95	22.95
Maths Mania (Ages 8-12)	29.95	22.95
Better Maths (Ages 12-16)	29.95	22.95
Maxi Maths (Ages 12-16)	29.95	-
Physics (Ages 12-16)	29.95	22.95
Better Spelling (Ages 9-99)	29.95	22.95
Chemistry (Ages 12-16)	29.95	22.95
Biology (Ages 12-16)	29.95	22.95
Weather/Climate (Ages 12-16)	29.95	22.95

From LCL SOFTWARE

Micro Maths (Grades 9-11)	59.95	49.95
Mega Maths (Grades 9-11)	59.95	49.95
Micro English (Grades 9-11)	59.95	49.95
Primary Maths (Ages 7-11)	79.95	49.95

From FERNLEAF SOFTWARE

(Developing Reasoning, Logic, Estimating and Forward Planning skills).

1. Treasure/Perfume Hunter (7-10)	49.95	39.95
2. Fletcher's Castle/Raider(8-12)	49.95	39.95
3. Thorn Seal/Ferry Captain (9-13)	49.95	-

From FUN SCHOOL: three discs in the series each containing 10 educational programs.

Vol 1 - ages 2 to 5	29.95	-
Vol 2 - ages 5 to 8	29.95	-
Vol 3 - ages 8 to 12	29.95	-

(All reviewed Issue 48 - Jan '89)

From DATABASE EDUCATIONAL SOFTWARE: A Fun School 2 series of three discs or tapes each containing 8 educational programs (Rev'd Jul 89).

CPC - continued

Fun School 2 - Under 6	34.95	24.95
Fun School 2 - 6 to 8	34.95	24.95
Fun School 2 - Over 8	34.95	24.95
THE MAGIC SWORD - Full colour reading book and complementary child's adventure	39.95	-
THREE BEARS - graphic adventure to improve logic, deduction and reasoning	34.95	-

CPC PERIPHERALS

AMX MOUSE Mk III - with superior ball technology and high resolution movement this updated mouse from Database gives total control and flexibility, and compatibility with Stop Press. Comes with an interface for CPC owners 150.00

COMPUTER/TV MODULATOR CONVERTER - an Amstrad unit (MP3) allowing a CPC colour monitor(CTM644 only) to be used as a colour television - all you need to connect is a TV aerial to watch your favourite stations 149.00
(Please add \$7.50 for certified post & packing)

KEMPSTON MOUSE - comes complete with Blueprint, a comprehensive graphics package 199.00

MOUSE MATS - keeps Mouse clean 19.95

RS232 SERIAL INTERFACE - for CPC464, 664 or 6128 229.50

64k MEMORY EXPANSION (464/664)

Converts the 464 into a 6128 (except for the ROMs) and gives 128k of memory. Is supplied with bank switching software in the form of RSXs to use the second 64k RAM as storage for screens, windows, arrays and variables. Allows the use of CP/M Plus as supplied on the 6128. 149.00

256k MEMORY EXPANSION (464/664)

Converts the 464 into a 6128 (except for ROMs) and gives a total memory of 320k. Is supplied with bank switching software in the form of RSXs. The 256k can store 16 full 16k screens or four extra banks of 64k. Allows the use of CP/M Plus as supplied on the 6128. 289.00

256k SILICON DISC SYSTEM (464/664)

Provides 256k of RAM disc accessible many times faster than the conventional drive and with a greater disc capacity. It can be logged on as drive B or in atwo drive system as drive C. Data can be transferred onto the silicon disc from a normal disc or from RAM, application programs can then work on the data at vastly increased speed. Will accept all normal disc commands such as LOAD, SAVE, CAT etc. 329.00

256k MEMORY EXPANSION (6128) 289.00

256k SILICON DISC SYSTEM (6128) 329.00

CPC UTILITIES

Model Universe - 3D rotating drawing program	54.95	-
Rampak - nearly fifty machine code subroutines	44.95	37.95
Supersprites - sprite designing and control program	29.95	19.95
System X - adds over 40 new Basic extension commands	29.95	19.95

JOYSTICKS

STAR CURSOR - very tough, all Australian designed and manufactured joystick with three year guarantee. Fully micro-switched, fire buttons on base and handle. Adjustable 4- or 8-way action. 54.95

WINNER 220 - a really robust joystick with built-in precision control. Fully micro-switched with two fire buttons on the base

CPC - continued

and two on the stem for fast and furious action 34.95

ZIPSTICK SUPERPRO - 90% British made quality moulded high impact plastic with self-centring actuator & eight-way micro switches. 1.4m of cable. Left and right hand fire buttons, steel shaft, non-slip rubber pads 39.95

ZIPSTICK ELITE - a smaller, specially designed hand-held model with similar specifications to the Superpro, but with just one forward centrally located fire button. Also has rubber pads on base for flat surface use 29.95

NEW KONIX NAVIGATOR - hand-held joystick with micro-switch precision control, steel shaft. 39.95

CPC MISCELLANEOUS

SCREEN FILTER	29.95
DUST COVERS - Australian made vinyl fabric dust covers in light grey colour for:	
464 monitor and keyboard	35.00
6128 monitor and keyboard	35.00
DMP2000/2160/3160 Printer	17.00

RIBBONS

Black Nylon for DMP 2000/3000/3160	19.95
Black Nylon for DMP4000	19.95

3" DRIVE CLEANING KIT 19.95

CF-2 3" DISCS EACH 7.25

JOYSTICK SPLITTER CABLE - to allow the use of two joysticks through the single joystick port of the CPCs (not simultaneously) 19.50

6128 'SEAL 'N' TYPE' KEYBOARD PROTECTOR Stops damaging spills etc. 29.95

Amstrad PCW Range 8256, 8512 and 9512

(unless otherwise stated)

(The games marked with a \$ symbol are known to work only on the 8256/8512)

PCW GAMES

Academy (Tau Ceti II) \$	65.95
Armageddon Man	57.95
Catch 23	57.95
Classic Invaders (Space Invaders style)	29.95
Classic Quest Adventures:	
Goblin Towers (moderate)	49.95
Forestland (hard)	49.95
Witch Hunt (very hard)	49.95
Corruption	59.95
CP Compilation - with 3-D Clock Chess, Backgammon, 3-D Draughts and Bridge 2000 - all on one disc	59.95
Distractions: 3 graphics games compilation: On the Run, 2112 AD and Nexor \$	59.95
Double T Patience - compilation of six frustrating games including Kuala Lumpur, Poker Patience and Fourways	64.95
Giant Killer - maths adventure 10 to adult	54.95
Graham Gooch Cricket (Ltd.Overs & Test Match)	49.95
Guild of Thieves	69.95
Gnome Ranger	59.95
Head over Heels	57.95
Heathrow ATC/Southern Belle	57.95
Ingrid's back	59.95
Knight Orc	59.95
Lancelot	59.95

PCW - continued

Living Daylights	49.95
Match Day II - <i>animated soccer action</i>	57.95
Mindfighter	65.95
Pawn, The	69.95
Return to Doom (<i>Topologika adventure</i>)	54.95
Scrabble de luxe	65.95
Steve Davis' Snooker	54.95
Strike Force Harrier	49.95
Time and Magik Level 9 trilogy: <i>Lords of Time, Red Moon & Price of Magik</i>	54.95
Tomahawk: helicopter simulation	49.95
World of Soccer - international Soccermanagement simulation	59.95
PUBLIC DOMAIN DISCS	17.50

PCW YEAR DISC

<i>Containing all the PCW type-ins published in The Amstrad User for issues shown</i>	
Year Disc 1 - Issues 25 to 40	27.50

PCW EDUCATIONAL

Better Maths (12-16 yrs)	39.95
Better Spelling (12-16 yrs)	39.95
Biology (12-16 yrs)	39.95
Chemistry (12-16 yrs)	39.95
Giant Killer - maths adventure 10 to adult	54.95
Magic Maths (4-8 yrs)	39.95
Maths Mania (8-12 yrs)	39.95

PCW PUBLISHING

Desk Top Publisher	99.00
Newsdesk International	89.00

STOP PRESS

The ultimate Desktop Publishing package for PCW owners. Combine text and graphics with 'what you see is what you get' facilities. The ideal publishing software solution for home enthusiasts, schools, societies and small businesses

Stop Press (disc only)	179.00
With AMX Mk III Mouse	299.00

PCW DATABASES

Cardbox	129.00
Cardbox Plus	199.00
Condor One	149.00
Masterfile 8000	119.00
TAIT Database and Labeller	49.95

PCW MISCELLANEOUS

BRAINSTORM - tool for structuring raw ideas in a logical manner	99.00
DAATAFAX PERSONAL ORGANISER a Gift Pack by Kempston - with software, stylish binder, subject tabs, and starter stationery	149.00
DATASTORE II - menu-driven customised report generator, mailing list and label printer. Can be used with type styler Supertype II.	89.95
FLIPPER 2 - splits your PCW (8256, 8512 or 9512) memory into two environments and lets you flip between them, eg.	

PCW - continued

between CP/M and Loco2. Not suitable for LocoScript 1.	89.95
GRAPHICS, THE UNIVERSE AND EVERYTHING... This latest version (2.0) provides the means to create professional graphics output and more. Source code included (All PCWs)	75.00
LIGHTNING BASIC PLUS - turbo charge your Mallard Basic (All PCWs)	75.00
MASTER PAINT - deluxe graphics program, for use with either mouse or keys	59.95
MINI OFFICE PROFESSIONAL - the PCW version of the highly successful Mini Office II with Spreadsheet, Wordprocessor, database, graphics and communications	149.00
MONEY MANAGER PLUS - cashbook/personal accounting	99.00
NEWWORD2 - only one available just	100.00

PERSONAL EXCELLENCE PACKAGE - High quality mental performance analyser	109.00
PLAN-IT - desktop organiser, plan budgets, sort files etc.	39.95

PRINT MASTER PLUS - create your own Banners, Letterheads, Signs, Calendars or Greeting Cards with graphics or borders supplied. (Runs under CP/M Plus only)	59.95
PROTEXT FILER - pop-up database module for Protex	69.95
PROTEXT OFFICE - as Protex Filer but with mail-merge and invoice generator module	99.95
PROTEXT PCW	179.99
PROSPELL PCW - spellchecker for most word processors incl. WordStar and LocoScript	89.95
SCRATCHPAD PLUS spreadsheet	99.00

STARTRACK - tracks you through 88 constellations and more than 600 stars	54.95
STOCKMARKET - watch your investments	79.95
SUPERTYPE II - 8 new different typestyles for use with all CP/M, LocoScript 1/2, LocoMail and Mini Office Professional files	39.95

TAIT ACCOUNTING SYSTEM - small business Debtors, Creditors and Invoicing	129.00
TEMPDISC - a disc full of instant templates exploiting LocoScript to the full. Provides a wide range of heading styles, agendas, invoices, borders and documents: Tempdisc 1 (needs Loco1) 59.95 Tempdisc 2 (needs Loco2) 59.95 Tempdisc 8.2 (needs Loco2, Locomail and 8512) 67.95 Tempdisc 9 (for 9512) 67.95	

T/MAKER - Relational database, Spreadsheet, Word Processor, Spell Checker, Graphics, List processor - for 8512s and 9512s only	149.00
TOUCH 'n' GO - typing tutor	69.00

PCW PERIPHERALS

8256/512 'Seal 'n' Type' KEYBOARD PROTECTOR Stops damaging spills etc.	29.95
9512 'Seal 'n' Type' KEYBOARD PROTECTOR Stops damaging spills etc.	29.95
CPS8256 SERIAL INTERFACE for PCWs for communications or adding extra printers	145.00
AMX MOUSE plus interface - the most popular and sought after peripherals for your PCW, especially with Stop Press	165.00
MM3 MARGIN MAKER - Single sheet locator and aligner for	

PCW - continued

PCW 8000 printers	34.95
PCW JOYSTICK INTERFACE from Kempston	T.O/S
SCANNER - Master Pack - a scanning device which attaches to a PCW printer head to copy photos or other art work, Master Scan software and MasterPaint, a powerful graphics package. Compatible with Desktop Publisher, FSE and Newsdesk International (8256 and 8512s only)	279.00
SCREEN FILTER	29.95

PCW DUST COVERS

Australian made vinyl fabric dust covers complete for the following PCWs:	
8256/8512 monitor, keyboard and printer	55.00
9512 monitor, keyboard and printer	60.00

PCW TASMAN RANGE

Tasword 8000	69.95
Tas-spell 8000	49.00
Tasprint 8000	39.00
Tas-sign 8000	69.95

PCW CONSUMABLES

PCW 8000s PRINTER RIBBONS Black Carbon/Multistrike or Nylon 19.95 Coloured Nylon - Blue, Red or Green 24.95	
PCW 9000s PRINTER RIBBONS Black Carbon/Multistrike 15.95 Black Nylon 19.95	
DAISY WHEELS FOR 9000s Prestige Pica 10; Prestige Elite 12; Courier 10; Cubic Pica 10; Mini Gothic 15/Micro; Orator 90%/10; Letter Gothic 10/12; Script 12 each 19.95	
3" DISC DRIVE CLEANING KIT	19.95
CF2 3" DISCS each	7.25

PCW LOCOMOTIVE PRODUCTS

LOCOSCRIPT 2 (latest) with manual	87.00
LOCOSCRIPT2 (latest) Disk only	49.95
LOCOSCRIPT 2 + LOCOSPELL2 pack	130.00
LOCOMAIL2	105.00
LOCOSPELL2	75.00
The following are for PCW 8000s using LocoScript 2.12 and above (Please state 8000s):	
24 PIN PRINTER DRIVER - suitable for most 24 pin print-head printers attached to 8000s	64.95
PRINTER CHARACTER SET DISC for defining new character sets	59.95
EXTRA PRINTER DRIVERS DISC containing a Printer File for every LocoScript2 compatible printer	59.95
KEYBOARDS DISC to configure LocoScript2 to use American, Canadian, Danish, English, French, German, Italian, Norwegian, Spanish or Swedish keyboard layouts with any nationality of LocoScript2.	59.95
LOCofile/8000 - the resident 'pop-up' database for LocoScript2	110.00
LOCOfont SET 1 adds nine extra fonts to your matrix printer	75.00
LOCOfont SET 2 adds a further set of five fonts to your matrix printer	65.00
LOCOKEY to customise your keyboard	59.95

PCW - continued

LOCOMAIL SORTING PROGRAM	39.95
LOCOMAIL2 EXAMPLES DISC	17.50
LOCOMAIL2 NEW USER GUIDE	54.95

The following are for PCW 9512s
(Please state 9512 when ordering):

24 PIN PRINTER DRIVER - suitable for most 24 pin print-head printers attached to the 9512 64.95

PRINTWHEELS DISC allows the correct printing of the characters from any printwheel supplied for the built-in printer. 59.95

LOCOFILE/9000 - the resident 'pop-up' database for LocoScript2 on the 9512 110.00

KEYBOARDS DISC to configure LocoScript2 to use American, Canadian, Danish, English, French, German, Italian, Norwegian, Spanish or Swedish keyboard layouts with any nationality of LocoScript2. 59.95

PRINTER DRIVER AND CHARACTER SETS supports a wide range of printers and printwheels used as an alternative to the built-in printer 59.95

LOCOMAIL SORTING PROGRAM 39.95

LOCOMAIL2 EXAMPLES DISC 17.50

Amstrad PC Range PC1512/1640, PPC512/640, PC20 and PC2000 series (unless otherwise stated)

Items marked with a "+" symbol are also available in 3.5" disc format. Items marked with a "#" symbol are supplied with both 5.25" and 3.5" discs.

PC & COMPATIBLES GAMES

221b Baker Street	49.95
2000 leagues under the sea	39.95
3-D Helicopter Simulator #	52.95
4 x 4 - Off-Road Racing †	49.95
4th and Inches (Grid Iron)	44.95
4th and Inches Construction Set	35.95
Abrams Battle Tank	54.95
ACE 2	33.50
Action Service	54.95
Airball (now supports EGA and VGA)	59.95
Airborne Ranger †	59.95
Ali	39.95
Amazon	32.95
Annals of Rome #	64.95
Apollo 18	59.95
Auto Duel	59.95
Backgammon	24.95
Bard's Tale #	49.95
Battle Chess (needs 640k) #	69.95
Battle Hawks 1942 #	64.95
Battle Tech #	61.95
Batman	69.95
Beyond Zork	59.95
Billiards	52.95
Bionic Commandos	54.95
Black Cauldron #	49.95
Black Jack Academy †	49.95
Blockbuster	48.50
California Challenge (Test Drive 2 add-on)	39.95
California Games †	49.95
California Raisins	

PC - continued

Captain Blood †	69.95
Captain Power	29.95
Carrier Command	59.95
Caveman UGH-Iympics †	64.95
Charlie Chaplin	69.95
Chuck Yeager's Adv. Fit. Trainer †	54.95
Circus Games †	59.95
Classic Quest Adventure Series:	
Forestland	39.95
Witch Hunt	39.95
Catacombs	39.95
Cornucopia	39.95
Classic Arcades 2: with Penngo, Arnold and Grand prix	59.95
Classic Invaders	29.95
Club Casino - 4 gambling programs	19.95
Computer Yahtzee #	29.95
Concentration	49.95
Convoy - road and transport games	19.95
Corruption	59.95
Crazy Cars 2 †	59.95
Crossbow #	59.95
Crusade in Europe	59.95
Curse of the Azure Bonds # (D.&Dragons)	64.95
Daley Thompson's Olympic Challenge	61.95
Dark Castle	49.95
Dark Side	54.95
Decision in Desert	59.95
Def Con 5 (American 'Star Wars' defence)	59.95
Demon Stalkers	54.95
Destroyer †	49.95
Doctor Ruth's Game of Good Sex (AO)	47.95
Double Dragon	61.95
Dragonworld	32.95
Dream Warrior	29.95
Driller	59.95
Earl Weaver's Baseball	47.95
Earl Weaver's Baseball Stats	34.95
Echelon	54.95
Elite	69.00
Emmannelle (AO)	39.95
Empire	47.95
F-15 †	59.95
F-16 Falcon †	62.95
F-16 Combat Pilot †	59.95
F-19 Stealth Fighter †	109.95
Fahrenheit 451	32.95
Family Feud	49.95
Fantasy Pak - arcade, war and mazes	19.95
Fast Break (Basketball)	59.95
Fire and Forget †	59.95
Fire Power #	47.95
First Expedition †	49.95
Fish	69.95
Flippit	39.95
Galactic Conqueror †	69.95
Games, The - Summer Edition †	49.95
Gnome Ranger	59.95
Gold Rush †	52.95
Gone Reel Fishin' #	61.95
Grand Prix Circuit #	59.95
Gunship †	69.95
Hardball	49.95
Heavy Metal	52.95
Hitch Hiker's Guide to the Galaxy	64.95
HKM (Human Killing Machine) - CGA & VGA	59.95
Horse Racing - strategy game	69.95
Hunt for Red October	49.95
Indiana Jones and the Temple of Doom	69.95
Impossible Mission II †	49.95
Ingrid's back	59.95

PC - continued

Inside Trader	59.95
International Team Sports - five Olympic events - coach and select the team then play the Games	59.95
Into the Eagle's Nest	48.50
Jack Nicklaus Golf	59.95
Jack Nicklaus Courses Vol 1	39.95
Jaws (from the movie)	59.95
Jeopardy	49.95
Joan of Arc	52.95
Kampfgruppe	69.95
Kings Quest 1 #	49.95
Kings Quest 2 #	49.95
Kings Quest 3 #	49.95
Kings Quest 4 (9x5.25" and 4x3.5") #	79.95
Knight Force †	69.95
Knight Orc	59.95
Kong Quest - four arcade classics	19.95
Kult	59.95
LA Crackdown †	39.95
Lancelot	59.95
Laptop Computer Chess 3.5" only	52.95
Leisure Suit Larry (AO) #	59.95
Leisure Suit Larry II (AO) #	59.95
Lombard R.A.C Rally	59.95
Man Hunter - New York #	64.95
Maze Adventures - four on one disc	19.95
Mean 18 Famous Courses 3/4	29.95
Millenium 2.2 (superb in CGA)	59.95
Mini Putt	49.95
Moto Cross #	59.95
Murder in Venice	59.95
Nebulus	49.95
Night Raider	59.95
Nine Princes in Amber	32.95
Nord & Bert couldn't make head nor tail...	47.95
Operation Neptune	59.95
Outrun	69.95
Pawn, The	69.95
Personal Nightmare †	79.95
Peter Rose Penmant Fever	47.95
PC Gold Hits Compilation (for CGA) with Infiltrator, Bruce Lee, Ace of Aces and World Class Leaderboard	49.95
Perry Mason - Mandarin Murders	32.95
Phantasie 1	69.95
Phantasie 3	69.95
PHM Pegasus †	59.95
Pinball Wizard	69.95
Pirates	59.95
Police Quest 1 #	59.95
Police Quest 2 #	59.95
Portal	47.95
Pools of Radiance (D. & Dragons) #	54.95
President Elect	69.95
President is Missing	59.95
Project Space Station	49.95
Prophecy	61.95
Psycho - the trail to the Bates Motel	49.95
PT-109	64.95
Purple Saturn Day † (Capt. Blood 2)	59.95
Quadralien	59.95
Quest for Timebird	69.95
Rack'em (Pool, Billiards, Snooker)	54.95
Rambo III	69.95
Reach for the Stars †	49.95
Red Lightning	64.95
Rendezvous with Rama	32.95
Robocop	59.95
Rodeo Games	59.95
Santa Paravia - 15th century strategy	29.95
Sapiens	69.95

PC - continued

PC - continued

PC - continued

Scavengers	54.95
Scrabble de luxe	52.95
Scruples	43.95
Serve and Volley	54.95
Sherlock	61.95
Shiloh	69.95
Shogun	52.95
Silent Service	59.95
Silicon Dreams	59.95
Silpheed #	52.95
Skweek †	59.95
Sleeping Gods Lie	59.95
Slots and Cards - casino simulator	59.95
Solomon's Key	69.95
Sorcerer Lord	59.95
Space Harrier	59.95
Space Max	69.95
Space Quest 1 #	59.95
Space Quest 2 #	59.95
Space Quest 3 #	52.95
Space Rogue †	59.95
Speed Ball	64.95
Sports Spectacular: golf, gridiron, archery	19.95
Spitfire Ace	59.95
Star Command	79.95
Star Trek: Promethian	49.95
Star Quake (Amstrad /stick port only)	59.95
Star Ray	59.95
Steel Thunder	61.95
Stellar Crusade	69.95
Star Glider	59.95
Station Fall	47.95
Street Sports Baseball †	49.95
Street Sports Soccer †	49.95
Strike Force - airborne arcade action	19.95
Sub Battle Simulator †	49.95
Super Cars (Test Drive 2 add-on)	39.95
Superman	69.95
Takedown (Wrestling)	59.95
Teenage Queen (Strip Poker) AO	49.95
Technocop	49.95
Test Drive 1	59.95
Test Drive 2 †	61.95
Tenth Frame	59.00
Tetris	62.95
Thexder #	59.95
Thud Ridge	54.95
Thunderchopper †	89.95
Time and Magik	59.95
Times of Lore	59.95
Titan	59.95
Ultima Trilogy (Ultima 1,2 & 3 + Hint Books)	69.95
Ultima V	59.95
UMS (War game simulator)	59.95
USS Stinger - submarine simulator	29.95
Usurper, The	59.95
'Vette (Corvette simulator)	69.95
War in Middle Earth	52.95
Wargame Construction Kit	69.95
WEC Le Mans	69.95
Wheel of Fortune	44.95
Where in Europe is Carmen Sandiego †	74.95
Where in Time is Carmen Sandiego †	79.95
Where in the World is Carmen Sandiego †	74.95
Where time stood still	61.95
Who framed Roger Rabbit †	54.95
Wibarm - puzzle solving arcade action #	69.95
Winter Games †	49.95
Wizardry 5	79.95
Wizard's Crown	69.95
Wierd Dreams	59.95

World Class Leaderboard Golf value pack	64.95
World Class Leaderboard with real sound	52.95
World Tour Golf †	45.95
Zac McKracken & alien mindbdrs (Hi-res) #	64.95
Zork Trilogy (Zork 1, 2 and 3)	69.95

PC HINT BOOKS

Gold Rush	13.95
Kings Quest 1	13.95
Kings Quest 2	13.95
Kings Quest 3	13.95
Kings Quest 4	13.95
Leisure Suit Larry 1	13.95
Leisure Suit Larry 2	13.95
Manhunter - New York	13.95
Police Quest 1	13.95
Police Quest 2	13.95
Police Quest 3	13.95
Space Quest 1	13.95
Space Quest 2	13.95
Space Quest 3	13.95
Zork Trilogy (Zork 1,2 and 3)	24.95

PC BUDGET GAMES

Arcade 1: Pitfall, Artillery, Goob and X-Wing	14.99
Arcade 2: Munchman, Bowling and Depth charge	14.99
Arcade Bonanza: Frog, Pac-em, Tank & Red Alert	14.99
Board Games	14.99
Master Blaster: Paratrooper, Round 42 & Rockets	14.99
Mind Games: Concentration, Magie, Hide-away and Mindscan	14.99
Sink the Bismark: Computer Battleships and Naval Trivia	14.99
Space Battles: Space War, Meteor Shower, Moon Lander and Space Zombies	14.99
Space Games	14.99
Strategy Games: Ruler, Killer Bees, Engineer, Sabotage and Vampire	14.99

PC EDUCATION

Alphabet Zoo	59.95
Better Maths (12-16 yrs)	39.95
Better Spelling (9- Adult)	39.95
Biology (12-16 yrs)	39.95
Chemistry (12-16 yrs)	39.95
Computerease - tutorial on PC	19.95
COMPUTEREASY EDUCATION SERIES:	
Maths Climbers	18.95
Mind Games	18.95
Mr. DOS	18.95
Read Easy	18.95
Schultz Treasure	18.95
Spell Castle	18.95
Type and Learn	18.95
Wordsearch 2000	18.95
Cryptocube	59.95
Decimal Dungeon	49.95
Delta Drawing	52.95
Fraction Action	49.95
FUN SCHOOL 2 SERIES (Reviewed Jul 89)	
Under 6	49.95
6 to 8	49.95
Over 8	49.95
Grammar Examiner	59.95
In search of the most amazing things	59.95
Kids on Keys	59.95
Kidwriter	59.95

Kindercomp	59.95
Lex, Wizard of Words (Ages 10 to 99) #	39.95
Magic Maths (4-12 yr) CGA	39.95
Maths Mania (8-12 yr) CGA	39.95
Maxi Maths (12-16 yrs)	39.95
Micro Maths - advanced for Years 9-11 students	69.95
Mixed up Mother Goose #	59.95
Notable Phantom	59.95
Number Fun 1 (5 to 15 yrs) #	34.95
ONCE UPON A TIME SERIES: for children (6 - 12) to write, edit and print their own book.	
Volume 1	69.95
Volume 2	69.95
Physics (12-16 yrs)	39.95
Race Car Arithmetic	49.95
Remember!	89.95
Sesame Street series - covers problem solving, predicting, logic & reasoning	
Ernie's Big Splash (4-6 yrs)	39.95
Astro Grover (3-6 yrs)	39.95
Grover's Animal Ad (4-6 yrs)	39.95
Big Bird's Delivery (3-6 yrs)	39.95
Ernie's Magic Shapes (4-6 yrs)	39.95
Pals around Town (4-6 yrs)	39.95
Science & Engineering - examples	49.95
Ships Ahoy	59.95
Spellagraph	59.95
Spellakazam	59.95
Spelling Fun 1 (5 to 15 yrs) #	39.95
Ten Little Robots	49.95
Typing Tutor 4 #	62.95
Word Fun 1 (5 to 15 yrs) #	39.95
Where in Europe is Carmen Sandiego †	74.95
Where in Time is Carmen Sandiego †	79.95
Where in the World is Carmen Sandiego †	74.95

PC BUSINESS

Ability Plus	299.00
Ability	199.00
Brainstorm	99.00
Business Dynamics - primer	39.95
Capital Budgeting	199.00
Cardbox PC	149.00
Cardbox PC Personal	349.00
Cardbox Plus Standard	895.00
Chartman - business graphics	129.00
Condor 1 Jnr	149.00
Corporate Finance	199.00
Desktop Accountant	450.00
Financial Accounting for non-Accountants	199.00
In-house accountant	169.00
MASTERFILE PC version 3 standard - the most popular database for Amstrad PCs and compatibles #	199.00
MASTERFILE PC version 3 full - the standard version with an integrated word processing module included #	269.00
MINI OFFICE PERSONAL - integrated database, wordprocessor, Spreadsheet and label printer	99.95
MONEY MANAGER PC - cash book including graphics	79.00
PERSONAL EXCELLENCE PACKAGE - a serious approach to assessing your thinking skills, IQ, mental performance and aptitudes	109.00
Personal Cardbox Plus	399.00
Protex PC	199.00
Protex Filer PC	69.95
Protex Office	99.95

PC - continued

RAM JET EXECUTIVE - gives PC1512 only a disc cache, print buffer, screen accelerator	189.00
Scratchpad Plus	99.00
SAGE SERIES (fully supported in Australia) †	
Bookkeeper	299.00
Accountant	449.00
Accountant (network version)	900.00
Accountant Plus	749.00
Accountant Plus (network version)	1200.00
Financial Controller	1149.00
Financial Controller (network version)	2500.00
Payroll (up to 999 employees)	599.00
Sales Force Management	199.00
Stockmarket - watch your shares	79.95
Tait Accounting - small business accounting with Debtors, Creditors and Invoicing	149.00
TBM (formerly ABC Business Pack) - an Australian supported integrated accounting and stock control package with many extras	499.00
TOP COPY PLUS - advanced word processing + macros	299.00
TWIN ADVANCED - integrated spreadsheet (like Lotus), graphics and database	189.00

PC UTILITIES

AWARD WARE - certificates, banners, cards Designer	49.95
BANNER MANIA # (for colour printers too)	59.95
CREDIT CARD ACCOUNTING SYSTEM	29.95
DISCO HARD DISK MENU SYSTEM - creates personalised menus, runs common DOS commands with one keypress.	99.00
EXPERT SERIES:	
Disc Tools	39.95
Filer	39.95
Money Power	39.95
PC Protection	39.95
Perfect Typing	39.95
Personal Finance	39.95
Personal Forms	39.95
Personal Publisher	39.95
Personal Skills	39.95
Writer	39.95
FILE RESCUE PLUS	69.95
GO! SERIES (all contain Computer ToolBox utility)	
GO! START - four function calculator, letter writer and typewriter, computer toolbox, address filer, notepad, maze game, print function for printing envelopes and address lists	29.95
GO! WRITE - prompts for business letters, memos, reports, invitations, calendars, banners and address forms	29.95
GO! FILE - fully functional database, just fill in the blanks in ready made file forms	29.95
GO! PLAN - fully functional spreadsheet, just fill in the ready made forms for planning retirement, savings, car expense, loans, etc.	29.95
HOME ORGANISER - with Inventory, Shopping list, Librarian and Planner	14.99
IANKEY TYPING TUTOR - crash course #	59.95
IANKEY TYPING TUTOR - for 2 finger typists #	59.95
MAIL SHOT PLUS - with graphical layout	99.00
MASTERING YOUR PC - a DOS & Typing tutorial	39.95
PERSONAL BANKING RECONCILER	29.95
PERSONAL POSSESSIONS INVENTORY	29.95

PC - continued

PRINT MAGIC	49.95
PRINT SHOP - over one million copies sold of this easy to use personal graphics package. 8 type styles, 9 borders, dozens of pictures to create personal cards etc. †	89.95
PRINT SHOP COMPANION - adds a calendar to Print Shop (monthly and weekly formats) plus facility to edit existing P/Shop graphics †	84.95
PRINT SHOP GRAPHIC LIBRARIES	
Disk 1 - over 100 pictures for holidays, special occasions, sport, zodiac signs, animals †	54.95
Disk 2 - symbols for hobbies, occupations, travel, music and health †	54.95
Holiday Edtn - 70 graphics for Christmas, Hanukkah, New Year, 10 new typefaces, 14 borders & 12 full panel designs †	54.95
PRINT POWER - multi fonts & borders	69.95
SPLASH - a VGA paint program with over 256000 colours which makes full use of the incredible high quality VGA graphics. 60 pattern and brush sizes, flip, stretch, fill, zoom, merge. Compatible with most DTP programs #	199.00
Tasword PC - word processor †	99.00
Tas-spell PC - spell checker †	95.00
Tas-print PC - style writer †	95.00
Tas-sign PC - sign maker †	95.00
Tascopy PC - graphics editor †	95.00

PC JOYSTICKS

ANKO PRECISION JOYSTICK: top of the range - with free floating or auto centring operation modes, dual axis trim controls for accurate control of cursor/aiming/movement, two fire buttons on base and one on stem and rubber feet for surface grip	49.95
ANKO STANDARD JOYSTICK: mid-range joystick with fire button on base and one on the stem, dual axis trim controls for accurate movement, rubber feet for surface grip	39.95
JUNBO JOYSTICK: the smallest in the range but just as accurate, with auto return centring and fine tuning to adjust movement control, long life variable resistor control, two fire buttons, suitable for hand held control	29.95
KONIX SPEED KING - hand-held (in the left hand) for a natural grip and total control. Microswitched twin fire buttons positioned under trigger fingers. Free or self centring solid steel shaft. Autofire feature.	49.95

MISCELLANEOUS

DISK DRIVE HEAD CLEANERS	
3.5" for PPC, PC20 or PC2000s	17.95
5.25" for PC1512/1640	17.95
JOYSTICK GAMES CARD: Easily fitted - allows the use of an IBM style joystick on your Amstrad	49.95
PC1512/1640 'SEAL 'N' TYPE KEYBOARD PROTECTOR	29.95
Stops damaging spills and dust	29.95
MOUSE DRIVER for Microsoft windows (allows the use of Amstrad with MicroSoft products)	59.95
MODEM - Amstrad's MC2400 (V21, V22, V22 bis and V23 2400 bps). Works with any IBM compatible and comes with communications software.	399.00

DUST COVERS

Australian made vinyl fabric dust covers in light grey for the following equipment: (please state your printer)	
PC1512 or PC1640 monitor and keyboard	36.00
PC20 system/keyboard	18.00
PC2086 monitor/system and keyboard	39.00

PC - continued

PC2286/2386 mon/system and keyboard	39.00
DMP3160 or LQ3500	17.00
DMP4000 or LQ5000	30.00
Epson LX-800 or Star NX-1000	17.00

DISK DRIVES/CARDS

FOR PC1512 or PC1640 (The PHDs also suit PC2086s without hard disks)	
20mb Portable Hard Drive on a card *	849.00
30mb Portable Hard Drive on a card *	929.00
40mb Portable Hard Drive on a card *	1249.00
20mb Internal Hard Disc *	649.00
* Add \$15 for certified post and insurance	
720k 3.5" int. disc drive **	289.00
720k 3.5" Ext. disc drive **	385.00
360k 5.25" Disc drive kit **	375.00

FOR PC20 and PC2086	
360k 5.25" External disc drive **	315.00
720k 3.5" External disc drive **	315.00

FOR PC2286 and 2386	
1.2 mb 5.25" External disc drive **	385.00
1.44mb 3.5" External disc drive **	385.00
** Add \$10 for certified post and insurance	

TAPE STREAMERS

Tape Streamer for the PC2086 **	1150.00
Tape Streamer for the PC2286/2386 **	1150.00
** Add \$15 for certified post and insurance	

MICROSOFT RANGE

Chart	550.00
Excel for Windows #	835.00
Flight Simulator †	95.00
Learning DOS †	95.00
Multiplan #	345.00
Project #	695.00
QuickBasic Compiler †	185.00
QuickC †	185.00
Windows 286 †	195.00
Windows 386 #	345.00
Word †	675.00
Works #	295.00
Word Exchange †	115.00

BOOKS for all Amstrads

Please note that there is a P&P charge of \$5.00 on all orders containing books over a value of \$20.00. This should be added to your remittance. Overseas orders please add \$10.00 to all orders.

CPC TITLES

Advanced User Guide	21.95
Amstrad Compendium	23.95
Childs' Guide to the Amstrad Micro	13.95
Disc System, The Amstrad CPC 464	28.95
Filing Systems and D/Bases for the CPC464	30.95
Graphics Programming Techniques	25.95
High Energy Programs for the Amstrad	9.95
Ins and Outs of the Amstrad	23.95
Machine Code for Beginners	21.95

BOOKS - continued

Machine Language for the Absolute Beginner	23.95
Practical "C"	29.65
Ready made Machine Language routines	23.95
Starting Basic - Bk 1	19.95
Sound, Graphics & Handling - Bk 2	24.95
Structured Programming on 464/664/6128	30.95
Watson's Notes Series (for younger readers)	
Book 1: First Steps in Basic	17.95
Book 2: Exploring Basic	17.95
Book 3: Computer Games	17.95
Whole Memory Guide - 464	30.95

LOGO TITLES

LOGO Pocketbook	17.95
Practical Logo on the Amstrad	27.95
Using DR Logo on the Amstrad	37.95

PCW TITLES

Advanced LocoScript on the PCWs	39.50
Desktop Publishing with the PCW	35.95
All in one business computing with the PCW and Mini Office Professional	37.95
Locomail User Guide - new version	54.95
LocoScript Pocketbook	17.95
LocoScript2 and the Amstrad PCW	
Computers - a complete guide	43.00
LocoScript2/LocoMail/LocoSpell: assignments and solutions	32.95
Mallard Basic - Introduction and Reference by Locomotive Software	39.50
Mastering the Amstrad PCW 8256/8512	32.25
Pocket Wordstar	30.95
PCW Machine Code	39.95
Program your PCW	32.95
Using Databases on the PCW	35.95
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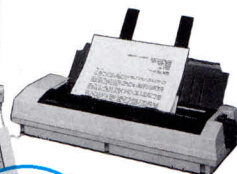
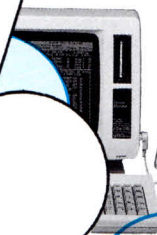
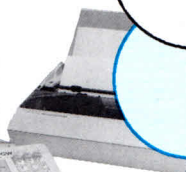
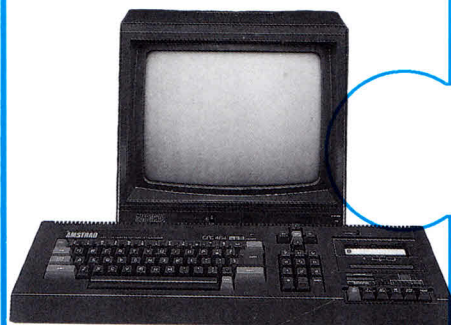
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