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# Computing *with the* AMSTRAD

Vol. 2 No. 8  
August 1988  
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# Computing with the AMSTRAD



Vol. 2 No. 8 August 1988

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Subscriptions: 081-480 0171

Telecom-Solid Mailbox: 72-MAG001

Telex: 255871 HONREF G

Quoting Ref MAG001

Postal Mailbox: 814548263

Published by:

**Dataseis Publications Ltd,  
Europa House, 88 Chiswick Road,  
Hazel Grove, Stockport SK7 9NR.**

Subscription rates for  
12 issues, post free:

£12 - UK & Eire (airmail only)

£25 - Europe

£40 - Overseas (airmail)

**ADP** 28.882 July-December 1988

"Computing with the Amstrad" welcomes program listings and articles for publication. Material should be typed or computer-printed, and preferably double-spaced. Program listings should be accompanied by cassette tape or disc. Please enclose a stamped, self-addressed envelope, otherwise the return of material cannot be guaranteed. Contributions accepted for publication by Dataseis Publications Ltd will be on an all-rights basis.

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"Computing with the Amstrad" is an independent publication and neither Amstrad Consumer Electronics Ltd nor Amstrad are responsible for any of the articles in this issue or for any of the opinions expressed.

News trade distribution:

Business Sales and Distribution Limited, Unit 1, Burgess Road, Inhouse Lane, Hastings, East Sussex TN35 4WZ, Tel 0424 630423.

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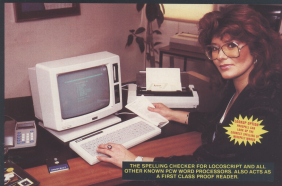




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**SAGE**'S Adele Kross-Roberts, technical support, and Jim Backworth, training manager, giving a dramatized presentation of Sage business software.

The demonstration was just one of a succession of non-stop business presentations which played daily to packed houses in the 150 seat theatre at the three day Amstrad Computer Show.

## Crackdown on copiers

A **CRACKDOWN** on sales of tape-to-tape copying devices was ordered by Database Exhibitions during the Amstrad Computer Show.

This followed reports that at least two companies had deliberately ignored a directive from the organisers that the products encouraging piracy should not be sold.

"We told them quite plainly that if they persisted, we would have to ask them to leave the show immediately", said Peter Barnard of Database.

"It was particularly irritating

**AMSTRAD** computers finally came of age during the fourth national show held in London. For the first time, businessmen and women along with professional users almost outnumbered hobbyists among the 13,000 visitors to the three days event.

Within an hour of the doors opening on Friday, exhibitors reported a statistically heavy demand from serious users, particularly those interested in the two PCW models. And a

significant proportion of this came from overseas visitors - mainly from Europe - eager to take part in the Amstrad experience in England, where it all started.

Many came looking for goods to import to their own countries where demand is currently outstripping supply. As a result there were numerous reports of deals worth in excess of £100,000 being struck over the weekend.

One exhibitor confided to *Computing with the Amstrad*

that an export contract he had signed would result in income of not less than £500,000 during the next 12 months.

"I came hoping for a breakthrough and it couldn't have been better", he said.

Gareth Lister of networking specialists Northern Computers best summed up the show: "I've been at each of the Amstrad Computer Shows and each one has reflected back what has been happening in the market.

"Since the first one, where it was mainly enthusiasts - and a lot of youngsters - the type of people attending has been transformed.

"This latest one exactly mirrored what has been happening of late with its shift to business.

"Not that it means it was full of people in bowler hats wearing ties - although there were a few of those around - but there was a substantial number of what I took to be self-employed people or those with greater business."

Richard White of Quest International was yet another who noticed the swing to the more serious user. "People were looking for products to make their machines more useful, rather than just to entertain them", he said.

Not that the show was exclusively the domain of the business market. Far from it. The number of new games for the CPC range in fact outnumbered those launched at any previous show.

"I took my 10-year-old son along with me and left him to his own devices while I looked for some business software", said game owner Paul Johnson.

"Obviously he was quite happy, because after three hours I had to drag him away from some games or other.

"As far as I am concerned it proved it was a great show, catering for all ages and tastes".

in the light of the fact they had chosen to ignore our previous warning. But you can rest assured we will make certain it doesn't happen again".

Yet at least one of the companies that had slipped through the net claimed it had ignored the instructions from Database because of Amstrad's own attitude to copying.

"Have you have the firm that is offering twin tape decks with its hi fi equipment. And what more obvious purpose do they have apart from copying other tapes", asked the info-exhibitor.



**THE** news that MML Systems was giving away free PCW512s at the Amstrad Computer Show resulted in a posse of computer journalists heading in their direction.

It turned out the laugh was on them. For the "freebie" was a paper cut-out of the machine that they needed to assemble themselves.

Andrew Clarke, of MML, and Alan Post, the wife of William Post, head of New Star Software, show off the joke offer.

## New award for 8256

**AMSTRAD'S** money-spinning PCW8256 has gained its second award in just two months, being named top in the consumer durables category at the 1986 Awards for Marketing.

This follows its success at the British Microcomputing Awards when it was judged the Best Home and Small Business Computer of the Year.

Alan Sagar, Amstrad's chairman, who was tipped by

newspaper publisher Eddie Shee for the Marketing Personality of the Year award, received the Crystal Lighthouse Trophy from Geoffrey John, chairman of Allied Bakeries, at the Dorchester Hotel, London.

The annual awards, organised by The Marketing Society and its co-sponsors Marketing Week, this year attracted over 80 nominations for individuals and organisations.

# Great News from GARWOOD

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(See also our Newsletter 1, September 2, September, and October)

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FREE PCW8256/8512 DUST COVER SET (worth £11.45) with every Software Order over £100 OR 2 pieces of software ordered

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## Modem battle rages on

THE battle for the Amstrad modem market is still being waged fiercely despite the fact that the company itself has already nominated Pace Micro Technology to carry its standard.

One leading challenger, Modern House, is claiming that Amstrad has made a major marketing mistake by deciding to lend its name to the Nightingale from Pace.

"As far as I am concerned, Amstrad has not looked around the market sufficiently before making its decision", insists Keith Rose, boss of Modern House.

"I have the greatest respect for Alan Sugar, and that's why I suspect he was not in on this, for there is little doubt he could have got a better deal from us or someone else".

Rose claims that notwithstanding Amstrad's decision to badge the Pace Nightingale, the Modern House Amstrad package will come out on top in the battle for customers. We can't really lose", he told Computing with the Amstrad, "after all, our package is not only better but cheaper".

Charger it is, for although the Amstrad/Pace modem is being offered for sale for £29.95, the additional cost of the software and interface from Pace would bring the total package price to more than £150.

In its own case, Modern House is offering a complete package based on its Voyager 2 modem for less than £120.

But does the Modern House come bundle compare favour-



Keith Rose

ably with the well known Nightingale modems and software? According to Keith Rose, there is no doubt.

"It has everything including auto dial and auto answer as standard", he says, "and it compares most favourably with the Pace package".

"If people are in any doubt perhaps they should realise that this is the only Amstrad CPC communications software currently stocked by Boots stores. And they are rapidly making a name for themselves in the camera field".

The first headline in what is likely to be a long and bitter battle for the Amstrad modem market was filed at the Amstrad Computer Show.

Modern House offered its Amstrad come package at a special show price of £29.95, while Pace countered with £175.

## An IBM clone for £399?

AMSTRAD is to launch its top secret IBM clone at the PCW Show in London on September 4 with a price tag of £399.

Though this has yet to be confirmed by the company, the news came from a source close to Amstrad itself.

If it proves to be correct, Amstrad will once again confront the market, where it has been confidently predicted the new machine will go on sale for £399.

However the one cloud on Amstrad's horizon, according to Computing with the Amstrad's informant, is that the back room boys are still having problems with the machine's graphics.

"This is the only thing that is holding them back for the moment", said our source. "but you can be certain that with Alan Sugar waving the big stick behind them they are pulling out all stops".

Meanwhile Amstrad is maintaining an official silence on the subject of the IBM-compatible computer.

Considered about it at the Amstrad Computer Show,

Amstrad technical wizard Roland Peavy was non-committal. "The standard reply is you shouldn't believe what you read in the newspapers", he said.

"One of the ways Amstrad stands out from other computer manufacturers is that you will only hear about new machines when they are ready to roll into the shops.

"Within a week of launch, you'll be able to buy one".

If the machine does hit the streets in September it may well be in time to meet the requirements for the priced Open University students course.

The OU recently asked all manufacturers for their comments on its specifications, which include that it should be sufficiently IBM-compatible to run both Lotus 123 and dBase packages. And they are asking for this and a lot more for just £399.

If the £399 price is right it would seem that there's just about only the Amstrad machine that could fit the bill", said one industry analyst.

Meanwhile a leading computer magazine in Germany has reported that the Amstrad IBM clone will be on sale there in September, with a price tag of £390.

## DIGGING FOR CHIPS?

COMPUTERISED amateur gardening becomes possible with the new release, Planter's Guide Pack, for the CPC range.

RAI Associates have listed over 1,000 plants and by keying in the conditions found in the garden, a list of suitable ones will be displayed.

The height, colour and best month for steady of each plant is also listed. An accompanying book gives a comprehensive description of each plant, plus a botanical/chemical and common/folklorical index.

## A kiss from Biggles



EXHIBITION organiser Christine Lees was the envy of all the girls at the Amstrad Computer Show when heart-throb actor Neil Dimes planted a kiss on her cheek.

Neil, the star of the movie "Biggles", was there to launch the computer game of the same name on the Microsoft stand.

## Free CPC games

FOR the first time MicroLink is offering free software for the Amstrad CPC range, with 30 new games available for downloading.

Among the titles on offer are Missile Command, Orkell, Town Cycles, Castle of Fear and Digger.

## Compilers for 8256

IBM's new versions of Pro Pascal and Pro Fortran compilers have been launched for the PCW8256.

Prosper Software is making them available through Software Toolbase, the Dunstable-based utility software distributor at £75 each.

Andrew Lomas, marketing manager for Prosper said: "Amateur users can now have a try at programming using some of the best professional software available and at a minimal cost".

Both products are equipped with a number of extensions such as long integers, random-access file handling and single and double precision floating point arithmetic.

The Amstrad versions feature new-style packaging and A4 sized manuals.

## WORDSTAR UPGRADE

AN improved version of Prolet WordStar has been released by MicroPro for the CPC8128, PCW8256 and 8512.

Prolet WordStar Deluxe has all the features of the original program plus SpellStar, for checking spelling, and a facility for creating a personal dictionary. Price: £89.95.



Programmer Matthew Neal explaining the Amstrad to Joel Grounau, Andrew Jones and Luke Grant

## They're the micro beach boys

A SEASIDE cafe overlooking Anglesey, North Wales, is the unusual setting for the newest and probably the smallest computer club.

Retired amusement machine engineer Harry Trew, 62 years young, set up the club with his Amstrad PCW8256, in the beach pavilion and cafe at Llanfihangel, near Gony.

"About five years ago I became interested in a computer using it to do the cafe accounts. Now I have retired I thought it a good idea to encourage youngsters and give up to see the cafe as a base for swapping computer ideas and knowledge", said Harry. The nearest club is at Colwyn Bay, about 15 miles away.

"We have two local experts able to help the youngsters. Some of them are studying A levels and use the machine for their homework".

When Computing with the Amstrad first about the Welsh club we contacted Inter-Action's Community Computers UK's managing director, Moll Lovell.

She said: "We are more than happy to respond. We will send him two of our handbooks which will answer all his problems about setting up a computer club".

## Focus on fun

UNARMED combat skills are vital factors in the new adventure game for the CPC range released by Acclaim.

The object is The First Axis to defeat the cyborgs in a race for artifacts from different periods of history.

It contains realistic graphics and multi-level challenges. The disc version costs £14.95, the cassette £9.95.

\*\*\*

THE CPC version of Mercenary - Escape from Tang - is to be re-released next month by Newagen. It will cost £9.95.

\*\*\*

GOBLING and "horrible funny spiders" are promised in the new adventure game for the CPC range.

The Knight, from CRL, has the ancient wizard Grandad riding Blimbo into a quest to find a dragon's secret cave.

The game is split in three parts and has over 100 locations. It will cost £7.95.

\*\*\*

FLAME-throwers, grenades and rocket launchers have come into their own in the war game Green Beret from Imagine Software for the CPC range.

Players act as a war machine and have to infiltrate four of the enemy's defense installations.

The game can be played via keyboard or with joystick. The cassette version costs £8.95 and the disc £14.95.

\*\*\*

A COMPUTER game version of the science fiction television series 'V' is the latest offering from Ocean Software for CPC computers.

In the game the visitors plot to destroy the Earth's population from a mother ship commanded by their leader Diana.

The game can be played by joystick or keyboard. The cassette costs £8.95 and the disc £14.95.

## Insure against breakdowns

A UNIQUE personal computer insurance package which for the first time offers breakdown cover is now available to subscribers to Computing with the Amstrad.

Underwritten by the giant Cornhill Insurance group, the scheme also provides protection against theft, accidental loss and damage at savings of up to 50 per cent, making it the cheapest in the country.

While the theft clause only applies to micros that are stolen from lockable buildings, the accidental loss and damage cover is for anywhere in the UK

- even while the computer is in transit.

Organized by Database Publications on behalf of its readers with leading brokers Mason and Mason, the breakdown section covers call out, labour and materials charges for all micros not under warranty.

As with all current policies, different rates apply to urban and metropolitan areas, the latter being judged high risk areas for theft.

Typical examples of annual premiums revealed that cover for a system - micro and peripherals - valued at £200

would be £15, at £500 some £18, and at £1,000 approximately £25.

Businessmen who subscribe to Computing with the Amstrad will also have the opportunity to join a company scheme which provides additional cover.

"The market has been crying out for a policy of this kind - particularly involving breakdown - for parts", says Derek Moxley, head of Database. "We are just pleased that we are able to offer it first to subscribers to Computing with the Amstrad".

For further details see Page 85.

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Now Digital Research, creators of the CP/M operating system, bundled with these business calibre Amstrads, offer serious users professional program development power and applications portability via two high level Digital Research languages: PASCAL/MT+ and CBASIC COMPILER.

Both languages come as complete packages of standard Amstrad 5<sup>1/4</sup> disks with full documentation.

### The most complete PASCAL £49.95.

PASCAL/MT+ is a full ISO standard PASCAL, extended to provide a comprehensive professional programming environment for industrial, business and educational applications.

It's faster, more versatile, more portable and easier to use in sophisticated applications demanding segmented development.

The package includes a compiler to generate relocatable object files, a linker to generate executable files from compiler outputs, a run-time support library covering transcendental functions, machine interrupts and other tasks, a disassembler and a symbolic debugger.

As well as standard ISO numerics, PASCAL/MT+ supports BCD and floating point real numbers for arithmetic precision. Special features reduce program size and enhance I/O capabilities. PASCAL/MT+ is the fully implemented PASCAL you can try with and never outgrow.

### Ten times faster with CBASIC £49.95.

CBASIC Compiler is a native code compiler that allows separate modules to be written, tested and combined to create a complete program. And it combines machine code speed with BASIC ease to produce programs that execute eight to ten times faster than the same interpreted programs.

A fully integrated set of device independent graphics statements and functions permits direct output to any graphics peripheral without recompiling.

Extended precision 16-digit decimal arithmetic ensures that fractional parts of pound amounts are exact and ledgers balance to the penny.

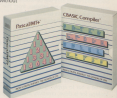
CBASIC Compiler also supports integer arithmetic, so you can use integer variables to increase execution speed.

Multiple line-function capability with multiple parameters provides features found in block-structured languages. Local variables can be declared in an MLR/MLF function or may be declared as external, belonging to an entirely different program module.

### Development Potential.

PASCAL/MT+ and CBASIC Compiler run on the Amstrad CPC 6128, PCW 8256, CPC 664 and CPC 464 with DD-1 disk drive. Use of graphics with CBASIC Compiler is only available on CPC 6128 and PCW 8256.

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**L**ET'S leave behind the lumps we get entangled with last month and move on to a whole new way of programming. But first we'll look at an old, horrible way of programming in the form of Program 1.

```
10 REM Program 1
20 PRINT "Enter monthly income"
30 INPUT monthly
40 IF monthly<200 THEN GOTO 100 ELSE
   GOTO 300
100 REM before tax threshold
110 PRINT "net pay is 'monthly' tax
   paid is 0"
120 GOTO 300
300 REM tax routine
110 tax=monthly*.1
120 net=monthly-tax
130 PRINT "net pay is 'net' tax paid
   is 'tax"
140 GOTO 300
300 END
```

Program 1

By now you should be well aware of my prejudice against GOTOs. They should be avoided at all costs, but in Program 1 there is not too bad as it's fairly easy to see what's happening.

All the program does is ask you how much you earn per month and stores it in the variable monthly. Line 40 then tests monthly to see if it is less than 200, in which case no tax has to be paid. If this is so the program jumps to line 100. Otherwise it goes to line 300.

Suppose that monthly had the value 100. In this case it's true that monthly is less than 200, so the program immediately moves to line 100. This is just a REM hinting at what the next few lines are going to do.

In fact they don't do much. Line 110 just tells you your net pay and the fact that you pay no tax. The next line is more interesting. Its GOTO has the program going to line 300, which is the END that ends the program.

Now, if monthly was 300 or over, say 300, the test of line 40 would fail and the part after the ELSE would be performed. This sends the program to line 300 which is the start of a section of code that works out the tax paid and the net pay.

There's nothing difficult in either

# GOSUB!

It isn't an instruction to collect your pay in advance, but it makes life easier in other ways

By PETE BIBBY

the coding or the maths. At the end of that, line 340 tells the program to GOTO line 300, the end again.

This last GOTO isn't really necessary, as the program would have come to line 300 anyway. However it's good practice to put it in to keep things tidy and allow easier modification of the program.

Notice the way that the IF of line 40 chooses between two sections of code. Also see how the two bits of code are completely separate. I've highlighted this by using line numbers starting at 100 and 300 for each section.

Only one of these bits of code is performed, the GOTOs being used to leap over the unused lines. Figure 1 shows the program's flow of control diagrammatically.

This idea of having separate sections of a program doing separate things is extremely important, as you'll find when you come to write more complicated, practical programs of your own. We'll see that they make it much easier to write, correct and modify programs.

We can also be fairly confident that they will work. The trouble is the GOTOs are messy and in a long

program they get messier. What we need are subroutines. Program 11 has an example of one of these in use.

Looking at lines 10 to 60 the program seems fairly straightforward. It takes a number from the keyboard and stores it in number. Line 60 obviously prints out the value of number squared and line 60 brings things to a halt. But what is this GOSUB 100 in line 40?

GOSUB tells the micro that it is to go to a section of code beginning at the line specified—in this case 100—and perform that. This code is known as a subroutine. The Amstrad obeys line 40 and goes to the subroutine starting at line 100.

This is just a REM labelling the subroutine. Take my advice, and always use a REM or two to explain what the subroutine does—or at least what you hope it does. It saves a lot of

```
10 REM Program 11
20 PRINT "Give me a number"
30 INPUT number
40 GOSUB 100
50 PRINT "the square of 'number' is "
   square
60 END
100 REM square routine
110 square=number*number
120 RETURN
```

Program 11



time, trouble and torment when you come to correcting or debugging faulty programs.

Once the program has entered the subroutine at line 100 it carries on as normal, going from line to line. In this case it ignores the REM and goes on to calculate the square of number, storing it in square.

The next line contains another new keyword, RETURN. This does two things. First of all it marks the end of the subroutine - note that there's nothing to show the start of a subroutine, hence the use of a REM.

In addition to that it also tells the micro to go back to the line that follows the one that called the subroutine, the line after the original GOSUB.

In this case it was line 40 that sent the program hurtling off to the subroutine starting at line 100, so the RETURN of line 120 sends the program back to line 50.

The micro then carries on as normal, going from line to line. Line 50 just displays the value of square and the next line, 60, ends the program.

If you like you can look on the subroutine as a little program in its own right. In Program II we only had one simple assignment statement before the micro came across the

RETURN that ended the subroutine.

In fact you can have all the normal Basic commands in a subroutine. So you can have loops, IF statements and even subroutines.

More of the latter later, but the point to grasp here is that GOSUB allows us to use a section of code without all the messiness we'd meet if we tried doing it with GOTOs.

A closer look at Program II produces a bit of a puzzle. After all, the END of line 90 brings things to a halt. So how does the program get to use lines 150 to 170 which come after the END?

The answer lies in the fact that the GOSUB that accesses the routine comes before the END. As this sends the program off to the code beginning at line 100 the END is jumped over.

It's rather like the way the GOTOs leap over code in Program I. At the end of the subroutine the program goes back to line 50 and then reaches the END of line 60, this END has to be there. Try leaving it out and see what happens. You get an:

## Inspected RETURN in 128

What's happened is that the program has performed as before, calling the subroutine and then RETURNing to the line after it, and carrying on from there. Only now the END is missing.

The program carries on undaunted and gets on with executing lines 100 and 110. So far so good, but what does the poor Amstrad do with the RETURN of line 120?

Normally when it needs a GOSUB the micro keeps a note of the following line number so it knows where to go back to when it needs a RETURN.

The GOSUBs and RETURNs are neatly paired, except at line 120 where the program now comes across a RETURN without having a matching GOSUB and hence no place to return to. The result is the computer gives up and an error message is issued.

So the rule is tuck your subroutines away at the end of the program after an END. You can look on these subroutines at the end of the program as similar to the appendices of a book.

When the program comes across a GOSUB it refers to the subroutines at the end of the program to find out what to do. After this brief diversion it

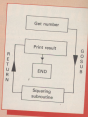


Figure 4. Flow of control for Program II

carries on with the main program. Figure 4 shows the flow of control in Program II.

Program III is a variation of Program I. This time it uses the much superior subroutines rather than the horrible GOTOs.

The first three lines do the same job as before, but line 40 has changed. It now chooses between two subroutines, rather than two sections of code insulated from each other by a series of GOTO-inspired jumps.

The code in these two subroutines is just the same as before, except that now they are tucked away after the END of line 60 and they are both terminated with RETURN.

In this case it makes little or no



Figure 3. Flow of control for Program I

```

10 REM Program III
20 PRINT "Enter monthly income"
30 INPUT monthly
40 IF monthly<200 THEN GOSUB 100 ELSE
   GOSUB 200
50 END
100 REM below tax threshold
110 PRINT "net pay is 'monthly' tax
   paid is 0"
120 RETURN
200 REM tax routine
210 tax=monthly*.1
220 net=monthly-tax
230 PRINT "net pay is 'net' tax
   paid is " tax
240 RETURN
  
```

Program III

## From Page 17

difference whether we use subroutines or not. The code is practically the same, although I think you'll agree that once you know about subroutines, Program III is easier to follow. As well as making programs simpler, subroutines can also save a lot of typing.

Many other programs use the same bits of code over and over again with only minor differences. A games program might calculate the score after every screen, the only difference in the sums being the actual bonus per screen held in, say, the numeric variable bonus.

It's much easier to have just one scoring subroutine and call it with the appropriate value of bonus, rather than copy out all the lines of the scoring routine each time you want to use it.

Subroutines not only simplify programs, they also make it much easier to alter them. Suppose that the tax laws suddenly changed and instead of being taxed at 10 per cent it becomes 20 per cent.

In Program I we have to search through the listing, find the appropriate line and change it. In Program III we can go straight to the tax routine subroutine and modify that in the light of the new rate.

In fact we could change all the code in that subroutine, adding new lines, and the program would still work. We could plug in an entirely new routine as needed, without having to worry about the rest of the program.

In the longer, more practical programs that you'll soon be writing this ability to modify programs by changing the subroutines makes life a lot easier. But before you start on creating an epic listing have a look at Program IV.

It consists of just two subroutines. The first — lines 100 to 130 — simply asks for the user's age and stores it in age. The second — lines 200 to 260 — prints out an appropriate message if the right age is entered.

Notice how the subroutines begin with an explanatory REM and each start on a line number which is a multiple of 100, making them easy to find.

The program itself is deceptively simple, but it does show a couple of

```
10 REM Program IV
20 GOSUB 100 collects age
30 GOSUB 200 displays message
40 END
100 REM collects age
110 PRINT "How old are you?"
120 INPUT age
130 RETURN
200 REM displays message
210 IF age=0 THEN PRINT "Liar"
220 IF age=0 AND age<3 THEN PRINT "to
a heart to read early"
230 IF age=18 THEN PRINT "You can't r
ate"
240 IF age<12 THEN PRINT "Over teen &
lissed?"
250 IF age=18 THEN PRINT "Your life i
s beginning again"
260 RETURN
```

Program IV

things. Look how short the main program is, it's only four lines long and one of those is a REM and another the END.

Really the only two lines doing the work are the two that call the subroutines. Yet in those two lines the whole structure of the program is shown clearly.

Can you see anything odd about lines 20 and 30? They both have a comment after them, but there's no REM. Normally this would cause a syntax error, but here nothing happens. Why not?

Let's look at line 30. First of all the Amstrad comes across the GOSUB 100. This is exactly what it does, working its way through the subroutine until it comes to line 130.

Here the RETURN tells the micro to go back to the statement following the one that called the routine. Hence the program goes straight to line 30. The message "collects age" is ignored completely so there's no syntax error.

It's the same with the next line. The "displays message" is lost because the GOSUB goes sliding — if there's such a word — and the RETURN returning to the next statement. This little trick allows the subroutines to be given a comment that makes the lines read like English. Unfortunately this only works on the CPC464. On the others in the CPC series you need a colon followed by a REM to annotate these lines.

I said earlier that subroutines could be looked on as mini-programs. They

```
10 REM Program V
20 GOSUB 100 collects age
30 GOSUB 200 displays message
40 END
100 REM collects age
110 PRINT "How old are you?"
120 INPUT age
130 RETURN
200 REM displays message
210 IF age=0 THEN GOSUB 300
220 IF age=0 AND age<3 THEN GOSUB 400
230 IF age=18 THEN GOSUB 500
240 IF age<12 THEN GOSUB 600
250 IF age=18 THEN GOSUB 700
260 RETURN
300 PRINT "Liar"
310 RETURN
400 PRINT "You heart to read early"
410 RETURN
500 PRINT "You can't rate"
510 RETURN
600 PRINT "Over teen & lissed?"
610 RETURN
700 PRINT "Your life is beginning ag
ain"
710 RETURN
```

Program V

can have IF statements and loops and all the normal structures. They can even call their own subroutines as Program V, which does the same job as Program IV, demonstrates.

The big change comes in the subroutine formed by lines 300 to 260. Here, instead of a simple PRINT after the IF, another subroutine is called.

These new subroutines are listed from lines 300 to 710. I haven't put in the normal opening REMs as I think the PRINT statements document them fully.

Of course it's a trivial example, but suppose that these subroutines were more useful than just a silly message. They might in fact be routines to work out age-related benefits.

So if you are between 18 and 65 and five years old the subroutine at 400 might contain all sorts of child welfare information and calculations. It might even call other subroutines.

● But none of that need worry. For the moment just grasp that the like file have little files, so subroutines can call subroutines. Next time we'll have a look at this in greater detail and see how it can help us plan our programs.

# Backgammon

By PAUL GOODINGS

**T**HIS version of the traditional game for the Amstrad CPC series pits you against your mirror.

It is played on a rectangular board which is divided into two halves, the Outer table (left) and inner table (right). The tables are in turn divided horizontally so that each player has half the Outer and half the inner table. Each table contains 12 points between which your 15 pieces move.

The object is to move all your pieces into your inner table (the bottom righthand quarter of the board) and then off the board. Each player in turn throws the two dice and may move two points an equivalent number of points according to the value on the dice.

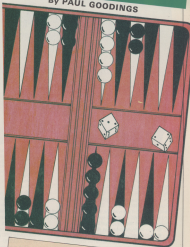
Alternatively a single piece may be moved according to the sum of the values of the dice. You have double moves when a doublet is thrown. The computer will move its pieces in a clockwise direction while you must move anti-clockwise.

Your piece may only land on a point which is either vacant, occupied by up to four of your own pieces or occupied by one of the computer's pieces - this is called a hit. Then the computer's piece goes to the middle of the table and the computer may not move again until the dice permit the movement of the hit piece to a vacant point (or a point occupied by one of your pieces) in your inner table. The computer may then resume play. You may be hit by the mirror in a similar fashion.

Only when all your pieces reach your inner table may you remove them from the board as the dice allow.

If you remove all your pieces from the board first, you are the winner. If the computer is hit or still has a piece in your inner table, you win a Backgammon. If the computer has not begun to remove its pieces from the board you win a Gammon or, if the computer has begun to remove it's pieces, you win a hit.

A game may be saved to tape or disc at any stage and detailed instructions can be called during a game while preserving the pieces' positions.



## MAIN VARIABLES

- col (24,2) Array holding coordinates of each point and number of pieces on each point.
- order (24,2) Array holding priority of each point in relation to the computer's next move.
- hit (12pt) Array holding coordinates of hit pieces.
- own, opp Numbers of pieces on board.
- hit, hit Numbers of hit pieces.
- score, score Points currently under bear's skin.
- score, score Scores.
- chance, chance Character codes of pieces.
- origin, dest Origin point and destination point of piece moved.

Full listing starts on Page 27

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```

2338 count=UPPER(ascii)/P:ascii**
2339 RETURN ELSE SPKOUT:ascii
2340 PRINT#9,a,ply,tc,fp,pc,pcr,111,r
(2)
2350 FOR y# 1 TO hp:FOR x# 1 TO 3
2360 PRINT#9,bi,ci,pl,ncnt:GOTO 2370
2370 FOR x# 1 TO hp:FOR y# 1 TO 3
2380 PRINT#9,bi,ci,pl,ncnt:GOTO 2390
2390 FOR x# 1 TO 3:FOR y# 1 TO 3
2400 PRINT#9,cd,bi,pl,ncnt:GOTO 2410
2410 GOTO 2420:GOTO 2430
2420 REM *** load game ***
2430 CL:OPEN I:PRINT:LOAD A:SAVE FROM
"APP":LOCATE 9,25:PRINT:GOTO
2440 LOCATE 1,18:FOR I=3:PRINT:PRINT:GOTO 2450
2450 count=UPPER(ascii)/P:ascii**
2460 a=FUNCTION ELSE OPEN:ascii
2470 PRINT#9,a,ply,tc,fp,pc,pcr,111,r
(2)
2470 FOR x# 1 TO hp:FOR y# 1 TO 2
2480 INPUT#9,bi,ci,pl,ncnt:GOTO 2490
2490 FOR x# 1 TO hp:FOR y# 1 TO 2
2500 INPUT#9,bi,ci,pl,ncnt:GOTO 2510
2510 FOR x# 1 TO 3:FOR y# 1 TO 2
2520 INPUT#9,cd,bi,pl,ncnt:GOTO 2530
2530 CL:PRINT:PRINT#9,P:PRINT:GOTO 2540
2540 RETURN
2550 REM ** reprint game **
2560 FOR pcnt# 1 TO 34
2570 IF col:point,1 THEN FOR y# 1 TO
col:print,11:clear:GOTO 2580:GOTO 2590
2580 IF col:point,2 THEN FOR y# 1 TO
col:print,21:clear:GOTO 2580:GOTO 2590
2590 GOTO 2600:GOTO 2610
2600 FOR y# 1 TO hp:LOCATE bi,11:bi
ci,2:PRINT:PRINT:GOTO 2620
2610 FOR y# 1 TO hp:LOCATE bi,11:bi
ci,2:PRINT:PRINT:GOTO 2620
2620 RETURN
2630 REM *** read coordinates & print
initial placements ***
2640 RESTORE 2700
2650 FOR pcnt# 1 TO 24
2660 READ col:point,11:READ col:point,
21:READ col:point,21
2670 FOR x# 1 TO col:point,11:clear:GOTO
2680:GOTO 2690
2680 FOR x# 1 TO col:point,21:clear:GOTO
2680:GOTO 2690
2690 GOTO 2700
2700 DATA 8,2,17,A,B,24,A,B,21,A,B,20
A,B,23,A,23
2710 DATA 8,A,18,13,A,15,A,B,13,A,B,A,
8,A,B,A,5,3
2720 DATA 5,A,18,A,B,8,A,B,1,A,B,12,A,
5,15,A,B,18
2730 DATA 8,2,22,A,B,25,A,B,20,A,B,21

```





**Program:** Harvey Headbanger  
**Price:** £7.99  
**Supplier:** Franklin/Westminster  
**Address:** Upper St Martin's Lane, London WC2N 3RL  
**Tel:** 01-7378 8338

THE screen is set right from the very beginning as the Morby Python theme tune plays while the game loads in.

Harvey Headbanger and his real Harshish Highball are two rather unusual characters who swing about the screen like a pair of crazy overweight rockers on teapots.

You take the part of either Harvey or Harshish with either your Amstrad or a friend controlling your opponent.

The screen consists of a 6 by 8 matrix of boxes. As you swing into a new box it

## Headaches can be fun

changes colour. If you completely surround an area of the screen with your colour a number of cocktail glasses appear which you can collect for extra points.

If your opponent is within this area he is instantly popped, leaving you swinging head over heels on a teapot with a big toothy grin on your face. Of course at the same time your opponent is trying to pop you, making it rather a difficult feat to accomplish.

With such large characters dashing about the screen there are bound to be many collisions and this can be used as a weapon against your

opponent.

However it has the unfortunate effect of giving you a blinding headache leaving you dazed and careering randomly about the screen for a while.

The cocktails when drunk give you extra immunity against these headaches and enable you to recover quickly.

If you can't find a friend to play against, the Amstrad makes an excellent opponent with five levels of difficulty.

The graphics are top class, the characters well animated and the music to accompany the game is quite pleasant.

Harvey Headbanger is great fun to play and although the



basic idea of the game is quite simple it's very addictive, requiring strategy and planning in order to win.

There's not a great deal of originality these days, but this is definitely different. I can thoroughly recommend it.

### Richard Woodhouse

Sound:	4
Graphics:	5
Playability:	5
Value for money:	10
Overall:	5

**Program:** Sai Combat  
**Price:** £8.99 (Amstrad), £12.99 (Atari)  
**Supplier:** Microsoft, Maxwell House, 74 Warwick Street, London EC2A 3ER

Sai Combat is the latest program to appear in the ever-growing field of martial arts simulations. Sai Karate is similar to normal Karate, but with the addition of a wildly stik with which to beat your opponent senseless.

You can choose either a 1 or 2 player game, with joystick or keyboard for control. A total of 18 different jumps, kicks and sweeps with your stik can be executed using combinations of joystick movement

with or without fire button.

The sound effects employed in the game are very realistic - the stik whistles through the air and lands with a satisfying crunch.

As both you and your opponent are armed with lengthy stiks you need to be both quick and clever to get in close enough to execute a karate style kick without being clattered round the head with a boom handle.

The action takes place against various colourful oriental settings. At the bottom of the screen there are

two pictures of a dragon's head.

These are both white at the beginning of the bout, but as you inflict damage upon your opponent his dragon begins to fill with colour. When it is completely coloured he loses a life.

Defeat him three times and you progress to the next level, of which there are eight in all.

Your opponents become increasingly stiffer and hit far harder - I was laid out by a single blow while necking a green tea.

Sai Combat has taken the



large colourful sprites of Yie Ai Gang Po, and successfully combined them with the superior action of Exploding Fist. Not to say more.

### James Kiddell

Sound:	7
Graphics:	8
Playability:	8
Value for money:	9
Overall:	8

**Program:** Dr Plo and the Mines of Toros  
**Price:** £7.99 (Amstrad), £14.95 (Atari)  
**Supplier:** Micro Power, Northwood House, North Street, Leeds LS1 2AA

YOUR old adversary the Master has taken over one of the moons of the planet Plo to mine for topazite, a rare mineral used in the building of a Time Instant Replay Unit (TIRU).

He plans to build his own TIRU to aid him in his plans to conquer the universe and he intends using your brain to make it more powerful. Can you, as the Doctor, put an end

## Who to the rescue

to his plans?

Out to stop you are the Controllers, Dalek-like machines that can sense your presence if you get too near.

Movement around the moon is by use of the platform and ladders that abound, but there is also a control lift that provides access to all sections of the complex.

There are two ways to get to this lift - both very dangerous and requiring split second timing.

The game can be saved and

you should be careful when using this facility. You score points by reaching machines with CCS written on them, and you only have the option of saving when you are at one of these machines.

Once you have saved in the computer does a hard reset. This means that if you save the game after having completed a difficult manoeuvre - something I do regularly when I can - you have to reload the game back in from the beginning.

The game itself, while having an excellent concept,



falls short in implementation. The graphics are jerky and sometimes near the standard we have come to expect from arcade adventures recently.

Sound:	1
Graphics:	2
Playability:	3
Value for money:	3
Overall:	4

**Program: Utopia**  
**Price: \$29.95 (ROM)**  
**Supplier: Amos, Via Studio,**  
**Lanham Place, Covington**  
**MSD 147, Tel: 01-888**  
**8553**

UTOPIA is a utility ROM enabling you with around 50 extra Basic commands in the form of RSDs. They can be split up roughly into disc utilities, programming utilities and ROM commands plus a few odds and ends.

The disc utilities include some of the commands found on the CP/M utilities disc, but they're much more convenient on ROM as they are instantly available.

**FORMAT** and **DISCOPY** will be familiar and are for

## Yours to command

formatting and copying discs. I will try **TYPE** and **DUMP** for displaying the contents of a file without actually loading it.

The normal **LOAD** and **SAVE** commands have been enhanced so, for example, it is now no longer necessary to load **HMMEM** before loading a binary file. Any block of memory can be saved as an **ASCII** file which wasn't previously possible.

There is a powerful disc editor which can be used for examining and modifying the contents of a disc. A similar facility does the same for memory.

The programming utilities

include **VARPS** which lists all variables used in a Basic program and **FN5** to list the names of all functions and the lines in which they occur.

**STATUS** displays useful information on a program, such as the start address, end address, length, first free location, memory taken up by the variables and so on.

**MOVE** allows you to move a block of Basic lines in a program. Regularly though, they're not remembered as you could and so with a program with line numbers like 10, 20, 50, 80, 30, 40, 70, 80

You can remember 2, but Basic gets confused by



**GOTOs** and **GOTOs** as it can't find the lines.

The function keys are conveniently set up with useful functions like **List Mode 2** and **Run**. The definitions can be listed with **Tokans**.

Utopia is an excellent ROM and one which I can thoroughly recommend.

**Richard Weddmore**

**Program: Equinox**  
**Price: \$9.95 (RAMROM),**  
**\$14.95 (disk)**  
**Supplier: Micro Gen, Unit 12,**  
**The Western Centre, West-**  
**ern Road, Buntingford SG12**  
**1996, Tel: 0344 422217**

It's clean up the environment time, and what better to get rid of than all those nuclear containers left lying about.

If you'd prefer to practice first Mike-Geri's Equinox will show you how hard the task will be, even if the precise details may not be realistic.

The containers are dispersed throughout eight levels of an asteroid mine, and the dispersal drill under your control has to deliver the radioactive containers to the

## Nuclear challenge

specifically designed chutes.

Nuclear objects may be picked up and dropped to enter the chute in this manageable task, and proper use of these is essential as the chute is constantly harassed and often destroyed by enemy aliens who infest the mines.

Nasty as they may be they show real character - one gets impatiently, while another is obviously a mutant dread driven daff by the radioactive levels.

Your dread has three lives, and the usual lives/energy remaining indicators appear at the top of the display. Also

provided are strange looking machines which transport the dread around the current level or have one level to another.

Unfortunately these odd ideas have to be paid for with a specially obtained credit, costing nothing more than one dread life. The magnetic life is free though, saving three lives energy.

The sprites are well and smooth, and the design of the mine screen is clear and colourful.

The sound effectively describes the screen activity, and with a good title page, definable keys, a jolly tune and



a genuinely challenging game there shouldn't be any complaints.

This is a well finished product, one of a number of good programs released by Mike-Geri over the past few months. Recommended.

**Phil Murfin**

Sound:	5
Graphics:	10
Playability:	8
Value for money:	5
Overall:	5

**Program: TurboBasic**  
**Price: \$14.95 (RAMROM),**  
**\$19.95 (disk)**  
**Supplier: Alan's, 180 Alga,**  
**Green Bank, Dunstable**  
**LU6 1AT, Tel: 0582**  
**89421**

**TURBOBASIC** is a Basic compiler which is designed to turn a Basic program into pure 286 machine code. The machine code can then be run directly with a consequent increase in performance.

The package consists of a tape or disc and small manual. On the disc version I used is the compiler itself and two demonstration programs written in Basic.

## Useful compiler

TurboBasic is a 286 machine code program which can be located anywhere in memory. It adds three new RSD commands: **MARK**, **COMPILER** and **RUN**.

Large Basic programs can be compiled directly from disc or tape and the code stored back on disc or tape.

The speed increase varies depending on what the program is doing and the code can be up to 40 times faster than Basic. However all variables and maths must be integer.

My only criticism is that the

manual is rather brief. All the information you require is there and an experienced programmer will have no trouble at all with it.

The compiler does impose certain restrictions and I would like to see more help for the novice programmer.

TurboBasic is far from perfect, but on the whole I prefer it to Ocean's Laser Compiler. It is much more flexible, it's easier to develop programs and it will cope with more Basic programs than Laser. If you're after speed and



haven't the time or knowledge to program in machine code Alan's TurboBasic could be just what you need. It won't solve all your problems and there are programming restrictions, but on the whole I can recommend it.

**Richard Weddmore**

**Program:** *Monopoly*  
**Price:** £9.99 (unrated).  
 £14.99 (rated)  
**Supplier:** Leisure Games, c/o  
 Virgin Games, 2-4 Hanson  
 Yard, Faversham Road,  
 London SE17 3JQ. Tel:  
 01-737 8670

**MONOPOLY** from Washington Games is probably one of the most popular board games on the market.

Up to six people can play or the computer can play all six places. Once the players and the pieces have been selected you can then play the normal game or the short version.

The only difference between the two is that in the shorter one a time limit is set -

## Monopoly for one

the winner being the person with the most monopolies at the end of the time period.

Each player starts off with £1,000. If you land on unoccupied property you can buy it, but if you land on occupied property you must pay rent to the owner.

If you own a full set of properties you can buy houses and hotels to increase the value of the rent payable.

The computer acts as the banker and takes care of all transactions as well as rolling the dice and dealing out Chance and Community Chest cards.

The menu allows the player to instruct the computer during the game to mortgage or un mortgage property, list all properties with the owner's number and give players access to their own properties.

The computer can also be told to buy or sell houses and hotels, trade with another player, claim rent from someone who has landed on bought property and throw the dice.

The board displayed on the screen doesn't show the details of the spots, but is just used to move the pieces around.



Monopoly plays well and the fact that one player can play is the obvious advantage, although the computer version does tend to lack some of the atmosphere of the proper board game. **Ian Saunders**

Sound:	3
Graphics:	2
Playability:	2
Value for money:	2
Overall:	2

**Program:** *Heavy on the Magic*  
**Price:** £9.99  
**Supplier:** Galaxy Games, 24  
 King Street, Dulles, West  
 Midlands B12 8JH

**THE** is the story of Axl the Axl who ever stopped the wizard during a session of wizard battling.

For his sins he was banished to a dank dungeon beneath Colodren's Pike. Armed only with OSE grade 3 Magic, he sets out to find the exit.

**Heavy on the Magic** is an adventure game which incorporates animated graphics, as opposed to an arcade adventure game.

The upper half of the screen

## Animated adventure

shows a pretty picture of Axl and his immediate surroundings and the lower half is divided into three windows.

The first shows spells, inventory or spots. The second is the window in which you enter your commands and receive answers to your queries. The third displays your levels of skill and luck.

The game is accompanied by a well written booklet which, in true adventure tradition, tells you the basic minimum about the game. One of the main challenges of the game is learning how to

play it.

As the game begins Axl stands there, cloak blowing in the breeze, waiting for your first command.

The commands available are entered using a single letter, such as A for examine, followed by the name of the object to be examined.

Axl will then walk to the object, peer down at it and report his findings. Similar commands are available for Pick, Drop, directions and spells.

Learning to use spells correctly is a must if you are to



survive for any length of time in the dungeon.

**Heavy on the Magic** is a game that will keep any adventure happy for a long long time. **Steve Brook**

Sound:	2
Graphics:	3
Playability:	3
Value for money:	3
Overall:	3

**Program:** *Spiky Hazard*  
**Price:** £1.99  
**Supplier:** Fantasy Software,  
 Wellington House, Upper  
 St Martin's Lane, London  
 WC2Y 9RL. Tel: 01-379  
 8788

**ACCORDING** to the latest weather report there will be a severe frost tomorrow. Unless Spiky Hazard the hedgehog can gather sufficient food in the next 24 hours he won't be able to hibernate and will fall foul of the weather.

The aim of the game is simple - guide Hazard through each of the 57 chambers which run under the hedgehog. Each chamber contains an item of food, and Hazard

## Prickly problems

must consume each's last meal within the 24 hours.

Unfortunately for Hazard he is not the only inhabitant of the hedgehog. The chambers are over run with weasels, snails, worms and sulphur clouds, all of which are fatal to the touch.

The screens are well designed, and although the programmer didn't see overboard with his use of colour they are quite acceptable.

The status line at the bottom of the screen displays the number of lives remaining, number of items collected and

an elapsed time clock. The bad guys are easy to identify as they are always coloured pale blue.

The game can be played using either joystick or keyboard, and the choice of key is user-definable. Response to the keyboard is instant and the animation fluidities.

Successful negotiation of a screen depends on spotting the safe path between the bad guys and split second timing when making your run. The multitude of lives proves invaluable when calculating either of these factors.



**Spiky Hazard** is unlikely to top the software charts, but it is still a competent piece of programming. At a price of £1.99 it should sell well.

**Carol Barrow**

Sound:	2
Graphics:	2
Playability:	2
Value for money:	2
Overall:	2

**Program:** 3-D Clock Chess  
**Price:** £19.95  
**Supplier:** CP Software, 15  
Seaport Road, London  
N7 8AP. Tel: 01-272  
2878

**Program:** Colossus 4 Chess  
**Price:** £18.95  
**Supplier:** CDS Software, Silver  
House, Silver Street, Don-  
caster, South Yorkshire  
DN1 7AG. Tel: 0302  
27134

## NOW-CHESS ON THE PCW

3-D CLOCK is an impressive program written specifically for the PCW, and Colossus has earned itself the reputation of being the most powerful home computer chess program around.

The obvious first point of comparison in reviewing these two packages was to pit them directly against each other. Various levels of play were tried, and the results were unequivocal - Colossus won nine games out of the ten played.

Does a performance like this mean that Colossus must be a better choice than 3-D Clock? Not necessarily.

In the first place screen presentation can be a crucial consideration in computer chess, and here 3-D Clock draws back what it loses in power to Colossus.

It offers superb graphics - in fact as good as that vector-writing linear GL display often left on the screen in computer games.

Secondly 3-D Clock gave its rival a good run for its money in most of the games. Colossus' record against a human former county player - me as a matter of fact, though that was a long time ago - was only slightly better than 3-D Clock. The scores were 5-3 and 3-3 respectively.

What is certain is that both these programs will offer a fair challenge to the majority of club players, without an interminable wait between each computer move.

Both offer all the standard facilities now expected in chess software: full play, limited computer moves, solving mating problems - unfortunately only of the chess variety - reverse board-colouration, save and load games from disc and so on.

Colossus has a wider range

of features but some players may well feel that 3-D Clock has all they will need.

The 3-D Clock display consists of a large board with beautifully drawn shaded pieces and an animated analog chess clock, complete with buttons and sweeping second hands, all giving an amazing life-like effect.

But it is not just a matter of approximating the computer wizardry that went into its development - it really does recreate a match-play atmosphere.

One of the problems of a 3D board is that it can be difficult to distinguish pieces when they overlap on the display, and I occasionally found myself checking the tops of other free pieces to be certain that I had not made a mistake.

However the problem has been reduced in 3-D Clock by clear outlines and a good board angle.

The screen also shows digital read-outs of elapsed move time and total time, and various pieces of information concerning the program's activity, such as the number of positions it has analysed and the depth of its look-ahead



search measured in ply - as in plywood - a move by one side being one ply. It also shows the move it predicts you will make - which you can use as a hint, or an assessment based on pieces and position of how the program thinks you are doing and so forth.

As with all modern chess

programs the level of play is set on a sliding scale by how much thinking time the computer is allowed - in this case between two seconds and about 10 minutes.

During this time it will systematically search deeper and deeper, while displaying the best line it has so far found, and its time is up.

Colossus matches all the screen information given in 3-D Clock, but its display is not of the same standard. The 3D



board is smaller, the pieces are less well drawn and confusing, and overlaps sometimes causes serious problems of piece recognition.

Fortunately the 2D context has been kept, and produces a more readable and playable display.

When it comes to board control, however, Colossus wins hands down. Whereas in 3-D Clock all moves have to be entered in alphanumeric form - e7-e3 and so on - Colossus makes full use of the cursor keys, allowing you to keep an eye on the chess board instead of carefully looking at the keyboard for fear of making a mistake with the coordinates.

Another major plus for Colossus, and no doubt one of the reasons why it plays a stronger game, is that it uses its opponent's time to carry on thinking.

It assumes that its opponent will make the move it has predicted - as with 3-D Clock this can be displayed as a hint - and calculates a

response accordingly.

Of course if the opponent decides to do a different move the extra thinking time has been wasted, but I found in practice that Colossus was predicting nearly 50 per cent of my moves.

Other features not found in 3-D Clock include the ability to single-step backwards or forwards through a game and to disable the computer move and thus provide an electronic chess board for two players - illegal moves and positions are still trapped.

Unlike 3-D Clock, Colossus can disable the openings book (which incidentally is far more extensive than that of 3-D Clock), provide a continuous display of the last seven moves, adjust the mechanism controlling the extent to which the computer will play for a win or a draw and print out a symbolic representation of the current position instead of just a screen dump.

3-D Clock comes with just a folded piece of A5 paper. Colossus, with a densely packed 20 page instruction manual.

Now, the author of Colossus has more to explain, but his manual does contain a mixture of redundant information.

In contrast the 3-D Clock instruction sheet is all lean meat and no fat, and crystal clear. Many technical writers would do well to take a leaf out of this book.

If you want to sit looking at a magnificent screen display, get the feeling of playing a real match and have a reasonably good game of chess plans for 3-D Clock.

If you want a stronger game, easier control of the pieces and are not too worried about good 3D graphics Colossus will be a better bet.

Gabriel Jacobs

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## Adventuring with Gandalf



# There's always a better way to cheat!

**O**NE of the enjoyable things about writing an adventure column is the feedback from those who read it.

This month I have had an improvement to Mike Wong's cheat program and a detailed strategic overview of winning with Lords of Midnight, as well as the usual cheery letters, as well as the usual cheery letters. I like this last type as it usually offers criticism as well as advice.

I quite often do something about this criticism and indeed, this is how Hall of Fame started. Which seems like a good time to say that if you have any improvements to suggest, we not write in and let the know? Remember, this column is for you - I just write it!

You may remember my asking in my review of Lords of Midnight in the March 1988 issue, whether it was possible to capture Uthgarak without losing Xajorkith to the forces of Doordank. John Invern seems to have done so and has sent in a complete summary of how he did it

plus some general tips on playing the game.

This should help those of you who have written in asking for help and should help with the follow up, Doordank's Revenge.

You will of course, have noticed that I have started putting part of a map of an adventure in this column each month. This month we take our second look at Tarnmoorica. If anyone wants me to publish maps or parts of particular adventures please write in.

Therstein Konatzke has written from West Germany with an improvement to Mike Wong's cheat program that also featured in the March 1988 issue. Program 1 is the updated version.

David Brown offers help with Subrunk, Neverending Story and Heroes of Karn. Any reader who would like help with any of these adventures should write to him at 18 Sylvana Close, Uxbridge, Middlesex UB 10 0SH. Don't forget an a/c.

```

28 REM Mike Wong's Cheat program
29 REM Improved by T.Konatzke.
30 REM (c) Computing with the Aestral
40 REM a lot easier to use!
42 TAPE
50 MODE 3:INK 0,0:INK 1,20:INK
3,44:INK 3,340:INK 0
60 PRINT "Reset tape-counter and
insert cassette"
70 PRINT
80 PRINT "Press ESCAPE twice when you
see a (aaa) block I &"
90 PRINT
100 ON BREAK GOTO 370
110 END
120 @=VAL("A"*(HEX(POD1)/7366)
,21)+HEX(POD1/7366), "0"
130 @=VAL("A"*(HEX(POD2)/7366)
,21)+HEX(POD2/7366), "0"
140 PRINT "Reset tape to 000"
    
```

```

150 PRINT/PRINT
160 MEMORY a-c
170 PER 3: L&@ ""
180 CL@: MO@ 3: PER 3: PRINT
"Modular" @ PER 3: PRINT CHEAT1
190 PER me to a/c
200 @=POD1/3
210 IF @11 @@ @1129 THEN PER 3:
PRINT CHE 01: @10 120
220 IF @11 THEN PER 3: PRINT "a";
230 NEXT @: PRINT CHE 170: PRINT@
PRINT/PRINT/ PER 3: PRINT "M&@": @:
PER 3: @=0: @
240 @=VAL(HEX(LEFTH @),10)
250 IF @10 "y" THEN CL@: @10
260 @10 100
270 ON BREAK GOTO 290
280 @10 120
290 END
    
```

Program 2: The improved cheat program



## From Page 37

it goes on.

**10. NOTHING** is what the rich man wants.

**1. TREES** have cold blood.

If you have the roots you can go into the twisted roots room.

Put the electrical cabling and throw the flask of water at the bodysuited. If you have the piles you can leave via the grating, otherwise you will have to show the busker your credit card.

Only gamble six times at the casino. Listen at the fountains. Search the frame park thoroughly for adverts and remember the numbers on them.

In the house insert the credit card into the terminal and drop the coins near the statue.

Rip up the washing powder for a free train ticket.

Get out of the train at the first stop and go to the Habibihome lift. Enter the number from the adverts. Add a zero to two digit numbers. Do not visit the charity or the dentist. To get back to the station use 000.

## Lords of Midnight—J&A Books

**The concept:** An attack by 25,000 Free/Pay on Uthgarak from the north using the eastern approach route via Ithron, the Plains of Longrim and Deadheaps.

The main events in chronological order are as follows:

■ Recruitment of Free/Pay Lords as quickly as possible.

■ Holding battles on the Plains of Blood and Dawn to allow recruitment and deployment of more distant Lords.

■ Dispatch of a small force, approximately 3,000, north along the west flank for deception, recruitment of Lords Gloom and Lothern in the northwest, and the protection of Morlin on his quest.

■ Dispatch of Morlin with Harflame to seize the Ice Crown and hide it.

■ Movement of recruited Lords via the Forest of Wipers and the Plains of Longrim towards the rendezvous point just south of Deadheaps.

■ Defence of Conley and Dawn by four Lords and 5,500 men with a progressive withdrawal towards Sajeekit.

■ Combined and simultaneous attack on Uthgarak by 25,000 men made up of the main army (18,000) assembled at Deadheaps and a second army moving east from Gloom (6,100). This takes place on the 22nd day and succeeds in the following eight period (23RD NIGHT).

**Also:** To win the wargame, assuming Morlin and Laxor stay alive, all you have to do is capture Uthgarak. In principle there is no need to defend Majorith or defeat Doomdark's armies in the field.

You should constantly ask yourself if your actions are really necessary to achieve this aim and therefore avoid fighting unnecessary battles.

**Enemy capability:** The computer controls very large forces but they move to a great plan and without coordination. Doomdark's armies tend to attack piecemeal, take little notice of the odds and do not respond to feints or deception. Thus if you avoid the main enemy lines of advance it is possible to attack Uthgarak without first fighting any large battles.

**Supply:** This is a vital aspect to the game and easily overlooked. Tired armies fight poorly and take heavy casualties. In essence, armies become tired following movement and, in particular, battle. They can be re-supplied by rest, that is not moving, visiting settlements (villages, keeps and castles) and – best of all – lakes.

However lakes and settlements can only be used once – although they will replenish a force of any size. When moving a large force over roughly the same route it is essential to plan the allocation of supply resources in minute detail so that all the armies are in a good condition to fight. For instance, an army which arrives early at a rendezvous can regain its strength by resting and leave the lakes untouched for forces that arrive later. (To be continued)

## PROBLEMS, PROBLEMS

Anette Flowers is having problems getting past the troll in Classic Adventures. She knows he wants some treasure but wants to know which one.

Lots of puns spring to mind here, such as "Egg him on" . . . "Don't be chicken-hearted" . . . "You could end up with egg on your face", and so on.

Throw the eggs to him and if you return to the location where you originally found them, saying "See the top boy" will restore them to your clutter (there we go again).

Simon Hadley is in difficulty with his first adventure, Message from Andromeda. You should **READ THE MESSAGE** and say **YES** when asked if you wish to investigate. Then **WAND THE SHIP** and **EXIT** on to the planet's

surface to begin the adventure.

Hilary Anderson keeps getting killed by the carnivorous willow tree in *Barad of the Rings*. Try **CRY HELP**. K. Pilgram is also stuck in this game at the Mirona gate. Drop the pepper.

Timothy Haley has nearly reached the end of *Adventure Quest* but cannot find the Black Tower. From the standing stones go through the marsh to the vampire's house. From the high rooms go out and south through the quicksand and you will find it. The boots will stop you sinking in the quicksand.

Stephen Hopwood is stuck in the goblin's dungeon in *The Hobbit*. Before you try to escape search your surroundings and break a wooden door to get something that will increase your score later. To get out, wait until either Gandalf (the real one)

or Thorin appears. Then **SAY TO GANDALF/THORIN 'OPEN WINDOW'**. Then **SAY TO GANDALF/THORIN 'CARRY ME'**. Then **SAY TO GANDALF 'LEAVE'**, or if it is Thorin, **SAY TO THORIN 'GO WINDOW'**.

Because the game is in real time, you should realise that both of your friends may be dead somewhere and that waiting for them may be pointless. They also sub-consciously, so you may need to keep trying the above commands.

S. Saltmarsh is also tackling his first adventure, *Heroes of Kern*. Kill the lanternlight with the bible to get the money. The frog on the dead man has in *Beren*, one of the heroes, so kiss the frog. To get out of the dungeon give the money to the guard.



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setanta software Ltd.

**T**HE classic format for arcade adventures appeared in 1984 when *Ultimate* unveiled *Knightlore* — the first 3D one to appear in Britain.

By now thousands of you must be familiar with the diamond-shaped 3D view created by looking down to the middle of each room from one of the corners.

However there still must be loads of you who have failed to crack the game and, apart from a couple of cheat codes, I have never seen a genuine analysis and fair solution of this original classic.

To play the game you must have a map (see Figure 1), an understanding of how and where the eight different objects are scattered and the ability to anticipate what order they must be placed in the central cauldron.

The map gives one of the eight

# A couple of classics

**ALEATOIRE** advises on *Knightlore*, and poses Ramanujan's problem

possible random scatters, and all you need do to generate the other seven is add 1 to each number and take the result modulo 8 — that is  $0 \rightarrow 1, 1 \rightarrow 2, \dots, 6 \rightarrow 7, 7 \rightarrow 0$ .

The order of objects into the

cauldron always starts somewhere in the cyclic pattern 7 6 5 4 3 2 1 4 2 7 1 6 5 3 and back to 7. As there are 14 objects in all knowing the first two required means you know precisely the order of the remaining 12 that must be collected, and so you can plan your itinerary accordingly.

Of-course moving around is not easy, but further analysis reveals that many of the rooms/areas can be ignored entirely because they are too dangerous, too avoiced or simply a waste of time. Such rooms are marked with an X in Figure 1.

Once all this is appreciated almost anyone who has a little expertise with the joystick and a lot of patience can solve the game. Note that patience is often essential. For example, the

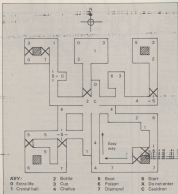


Figure 1: *Knightlore* map

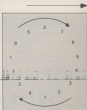


Figure 2: Cyclic order of objects into the cauldron

## From Page 35

room in the top left hand corner cannot be reached if you are a wirecuff — you must wait to metamorphose back into Salseman.

Incidentally some of the objects are hidden, but you can verify their presence because the program never allows more than two objects to be dropped in a room.

To actually get hidden objects needs a little confidence as you drop into the unknown — but given that, plus a little practice, and you should succeed well within the 40 day limit. My best time is 21 days, so the game still has some interest even after the dust has cleared and whirled around you for the first time and you have been told to "go forth to millennium".

Another classic puzzle was set many years ago by the British mathematician S.H. Hardy when visiting a sick friend in hospital. The friend, an Indian called Ramanujan,

was a self-taught mathematical genius who lived and breathed number theory — mention almost any number number to him and he could give it a unique property.

Hardy, attempting to make conversation, remarked that the taxi he had just used had the rather uninteresting number 1729. "On the

With the aid of a computer and a little bit of analysis you can solve it in less than an hour

other", said Ramanujan. "It is the smallest number that can be represented as the sum of two cubes in two different ways" — that is,  $1729 = 1^3 + 12^3 = 9^3 + 10^3$ .

Hardy immediately asked what then was the smallest number

representable as the sum of two biquadrates — that is, numbers to the power of four. Ramanujan replied that he did not know the answer, though he imagined it must be very large. A few months later he was dead.

Can you solve Ramanujan's problem? To encourage you I have calculated that  $3252611042 = 7^4 + 238^4 = 167^4 + 333^4$ .

However this is not the smallest solution by a long way. The attraction of the problem is that with the aid of a computer and a little bit of analysis you can solve it in less than an hour. There is a prize for the first correct answer, but tackling the problem is a rewarding exercise in itself.

My advice is to study the two cubes in two different ways first, and then generate the 10 unique numbers less than 100,000 that can be expressed in this way. Having done that you should see how to efficiently solve the much bigger biquadrate case. ■

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# A Z80 assembler and screen editor

Part VIII of  
**COLIN  
FOSTER's**  
exploration  
of CP/M 2.2

**T**HIS month we'll look at **ZSM.COM** — a Z80 assembler for CP/M and **EDIT.COM** — a fairly basic but usable screen editor which you can use to create assembler source files.

Both of these programs are in the public domain and are available through the CP/M Users Group, but as a special service to our readers we are distributing them both together on this month's listings disc.

**ZSM.COM** is a typical CP/M assembler, and much of what follows will be applicable to any other similar program you may have. If you are used to Amstrad editor/assembler programs such as DevPac you'll find **ZSM** a bit different.

For a start you need a separate editor to create the source file on disc which the assembler will use as input. Instead of using an editor which comes built-in to the assembler — almost all CP/M assemblers and language compilers work in this way.

Figure 1 shows a simple **ZSM** example program as it would be

typed into an editor — this program uses **BDOS** function 9 to print a message string on the screen.

Also Amstrad assemblers normally produce executable machine code output either in memory which you run there and then, or as a **DIR** disc file — CP/M assemblers and languages normally do not.

Instead they produce a file on disc containing one of two common types of intermediate object code — either Intel **HEX** (decimal or Digital Research/Microsoft **RELOCatable**, signified by **.HEX** and **.REL** filetypes respectively). **ZSM** produces **.HEX** format files.

**HEX** files are simple to understand, but difficult to explain to someone who is not used to the idea. Basically they contain the same machine code as a **.COM** file, but in a form which is readable instead of being executable — an **Ascll** representation of the binary numbers.

They also contain other information, such as the load address of the code and checksums. We can use the **Type** command to look at a **.HEX** file

on the screen. Figure 2 shows how such a file is made up, and Figure 3 shows the **HEX** output from our example source program.

Microsoft **REL** relocatable intermediate files are a common form of output from more powerful assemblers and most CP/M language compilers — for example, Microsoft's **Macro-80** assembler, **Pascal MV+**, **Fortran-80**, and **DR's** **Amstrad** assembler supplied with **CP/M Plus**.

**REL** is a much more complex form of output than **HEX**, and I won't go into it in any great detail here. Basically **REL** format is designed to allow programs to be written as separate and independent modules, each of which can nevertheless refer to routines and variables in other modules or in existing library files.

The different modules are then put together into one program, and all the external references between modules resolved by a program called a linker. Examples of linkers are **DR's** **Link**, which is supplied with **CP/M Plus**, and Microsoft's **Link-80**.

**HEX** files are designed for transmission along **RS232C** or telephone cables, and for downloading to target hardware under development from another computer — their set **Ascll** format and checksums allow easy error checking when they are received at their destination.

Before we can run such files we must convert them into straight binary **.COM** files — CP/M's equivalent to **AMSDOS** **.BIN** program files. There are two ways of doing this.

Firstly we can use the utility **LOAD.COM** — if we type:

```
load prog
```

then **Load** will read the **OURPROG.HEX** file created by the assembler and will create an **OUR-**

```
1)  Use program for Z80 assembler
2)  Use BDOS function 9 to print message on Console

org    1000

mov    r0, #0
mov    r1, #0
mov    r2, #0
mov    r3, #0
mov    r4, #0
mov    r5, #0
mov    r6, #0
mov    r7, #0
mov    r8, #0
mov    r9, #0
mov    r10, #0
mov    r11, #0
mov    r12, #0
mov    r13, #0
mov    r14, #0
mov    r15, #0
mov    r16, #0
mov    r17, #0
mov    r18, #0
mov    r19, #0
mov    r20, #0
mov    r21, #0
mov    r22, #0
mov    r23, #0
mov    r24, #0
mov    r25, #0
mov    r26, #0
mov    r27, #0
mov    r28, #0
mov    r29, #0
mov    r30, #0
mov    r31, #0
mov    r32, #0
mov    r33, #0
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mov    r57, #0
mov    r58, #0
mov    r59, #0
mov    r60, #0
mov    r61, #0
mov    r62, #0
mov    r63, #0
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mov    r962, #0
mov    r963, #0
mov    r964, #0
mov    r965, #0
mov    r966, #0
mov    r967, #0
mov    r968, #0
mov    r969, #0
mov    r970, #0
mov    r971, #0
mov    r972, #0
mov    r973, #0
mov    r974, #0
mov    r975, #0
mov    r976, #0
mov    r977, #0
mov    r978, #0
mov    r979, #0
mov    r980, #0
mov    r981, #0
mov    r982, #0
mov    r983, #0
mov    r984, #0
mov    r985, #0
mov    r986, #0
mov    r987, #0
mov    r988, #0
mov    r989, #0
mov    r990, #0
mov    r991, #0
mov    r992, #0
mov    r993, #0
mov    r994, #0
mov    r995, #0
mov    r996, #0
mov    r997, #0
mov    r998, #0
mov    r999, #0
mov    r1000, #0
mov    r1001, #0
mov    r1002, #0
mov    r1003, #0
mov    r1004, #0
mov    r1005, #0
mov    r1006, #0
mov    r1007, #0
mov    r1008, #0
mov    r1009, #0
mov    r1010, #0
mov    r1011, #0
mov    r1012, #0
mov    r1013, #0
mov    r1014, #0
mov    r1015, #0
mov    r1016, #0
mov    r1017, #0
mov    r1018, #0
mov    r1019, #0
mov    r1020, #0
mov    r1021, #0
mov    r1022, #0
mov    r1023, #0
mov    r1024, #0
mov    r1025, #0
mov    r1026, #0
mov    r1027, #0
mov    r1028, #0
mov    r1029, #0
mov    r1030, #0
mov    r1031, #0
mov    r1032, #0
mov    r1033, #0
mov    r1034, #0
mov    r1035, #0
mov    r1036, #0
mov    r1037, #0
mov    r1038, #0
mov    r1039, #0
mov    r1040, #0
mov    r1041, #0
mov    r1042, #0
mov    r1043, #0
mov    r1044, #0
mov    r1045, #0
mov    r1046, #0
mov    r1047, #0
mov    r1048, #0
mov    r1049, #0
mov    r1050, #0
mov    r1051, #0
mov    r1052, #0
mov    r1053, #0
mov    r1054, #0
mov    r1055, #0
mov    r1056, #0
mov    r1057, #0
mov    r1058, #0
mov    r1059, #0
mov    r1060, #0
mov    r1061, #0
mov    r1062, #0
mov    r1063, #0
mov    r1064, #0
mov    r1065, #0
mov    r1066, #0
mov    r1067, #0
mov   
```











works you may like to refresh your memory about the structure of a Basic line with the articles *More Basic Works in the November and December 1985 issues of Computing with the Amstrad*.

The logical structure of the program runs like this:

Use the first two bytes of the line to generate the address of the next line. If the bytes are both zero then we're past the end of the program so return, else store new address. Get and store the line number, find the address of the first program byte in

the line and subtract the length of the variable name from the remaining line length.

If the answer is less than or equal to zero then the line is too short so jump to the next line, else make this value a loop counter for the next step. Move along the line comparing the first byte of the variable name with the bytes of program data converted to upper case if required.

If at the end of the line move to the next line. If a match is found then compare any remaining bytes of the variable name with subsequent bytes

of program data. If at any stage a mismatch occurs then carry on the main search where it was left off, otherwise if a total match was found convert the line number to decimal, print it and continue searching on the next line.

The routine to convert a 16 bit number to decimal and print it out is fairly simple and is just the job for printing out, for example, the score in your latest Ataris Masterpiece. Yarpump and Vind together should save you hours in debugging your Basic programs. Happy hunting. ■

## Program 1

```

100 DATA 47,00,40,41,00,44,00,00
110 DATA 51,AC,FF,70,FE,41,0A,00
120 DATA FE,C0,AF,00,77,0A,00,00
130 DATA 20,00,70,00,C0,FF,00,21
140 DATA 70,41,00,00,FF,70,40,00
150 DATA 11,00,00,00,0A,00,00,00
160 DATA 00,40,00,0A,00,00,00,44
170 DATA FF,00,00,00,00,0A,00,70
180 DATA 00,00,00,00,00,00,1A,00
190 DATA 20,00,00,00,00,00,00,00
200 DATA 00,00,1A,00,00,00,0A,00
210 DATA FF,0F,1A,00,0F,00,00,0A
220 DATA 70,70,C0,00,70,40,00,00
230 DATA 70,21,AC,FF,00,70,0A,70
240 DATA 44,0A,00,00,C0,0F,00,00
250 DATA 00,C0,FF,FE,00,21,00,00
260 DATA C0,70,FF,00,00,00,00,00
270 DATA 0A,0F,00,00,00,00,00,00
280 DATA 00,00,00,00,00,00,00,00
290 DATA 00,00,00,00,00,00,00,00
300 DATA 00,00,00,00,00,00,00,00
310 DATA 00,00,00,00,00,00,00,00
320 DATA 00,00,00,00,00,00,00,00
330 DATA 00,00,00,00,00,00,00,00
340 DATA 00,00,00,00,00,00,00,00
350 DATA 00,00,00,00,00,00,00,00
360 DATA 00,00,00,00,00,00,00,00
370 DATA 00,00,00,00,00,00,00,00
380 DATA 00,00,00,00,00,00,00,00
390 DATA 00,00,00,00,00,00,00,00
400 DATA 00,00,00,00,00,00,00,00
410 DATA 00,00,00,00,00,00,00,00
420 DATA 00,00,00,00,00,00,00,00
430 DATA 00,00,00,00,00,00,00,00
440 DATA 00,00,00,00,00,00,00,00
450 DATA 00,00,00,00,00,00,00,00
460 DATA 00,00,00,00,00,00,00,00
470 DATA 00,00,00,00,00,00,00,00
480 DATA 00,00,00,00,00,00,00,00
490 DATA 00,00,00,00,00,00,00,00
500 DATA 00,00,00,00,00,00,00,00
510 DATA 00,00,00,00,00,00,00,00
520 DATA 00,00,00,00,00,00,00,00
530 DATA 00,00,00,00,00,00,00,00
540 DATA 00,00,00,00,00,00,00,00
550 DATA 00,00,00,00,00,00,00,00
560 DATA 00,00,00,00,00,00,00,00
570 DATA 00,00,00,00,00,00,00,00
580 DATA 00,00,00,00,00,00,00,00
590 DATA 00,00,00,00,00,00,00,00
600 DATA 00,00,00,00,00,00,00,00
610 DATA 00,00,00,00,00,00,00,00
620 DATA 00,00,00,00,00,00,00,00
630 DATA 00,00,00,00,00,00,00,00
640 DATA 00,00,00,00,00,00,00,00
650 DATA 00,00,00,00,00,00,00,00
660 DATA 00,00,00,00,00,00,00,00
670 DATA 00,00,00,00,00,00,00,00
680 DATA 00,00,00,00,00,00,00,00
690 DATA 00,00,00,00,00,00,00,00
700 DATA 00,00,00,00,00,00,00,00
710 DATA 00,00,00,00,00,00,00,00
720 DATA 00,00,00,00,00,00,00,00
730 DATA 00,00,00,00,00,00,00,00
740 DATA 00,00,00,00,00,00,00,00
750 DATA 00,00,00,00,00,00,00,00
760 DATA 00,00,00,00,00,00,00,00
770 DATA 00,00,00,00,00,00,00,00
780 DATA 00,00,00,00,00,00,00,00
790 DATA 00,00,00,00,00,00,00,00
800 DATA 00,00,00,00,00,00,00,00
810 DATA 00,00,00,00,00,00,00,00
820 DATA 00,00,00,00,00,00,00,00
830 DATA 00,00,00,00,00,00,00,00
840 DATA 00,00,00,00,00,00,00,00
850 DATA 00,00,00,00,00,00,00,00
860 DATA 00,00,00,00,00,00,00,00
870 DATA 00,00,00,00,00,00,00,00
880 DATA 00,00,00,00,00,00,00,00
890 DATA 00,00,00,00,00,00,00,00
900 DATA 00,00,00,00,00,00,00,00
910 DATA 00,00,00,00,00,00,00,00
920 DATA 00,00,00,00,00,00,00,00
930 DATA 00,00,00,00,00,00,00,00
940 DATA 00,00,00,00,00,00,00,00
950 DATA 00,00,00,00,00,00,00,00
960 DATA 00,00,00,00,00,00,00,00
970 DATA 00,00,00,00,00,00,00,00
980 DATA 00,00,00,00,00,00,00,00
990 DATA 00,00,00,00,00,00,00,00

```

## Program 2

Variable final source code

```

1000 LINE$=""
1010 PRINT "Error Checking messages"
1020 PRINT "====="
1030 PRINT
1040 PRINT "==== Get String Contents ==== "
1050 PRINT
1060 IF 1 THEN GOTO 1070
1070 GET C$
1080 IF C$="" THEN GOTO 1090
1090 IF C$=" " THEN GOTO 1090
1100 IF C$="." THEN GOTO 1110
1110 IF C$="," THEN GOTO 1110
1120 IF C$=";" THEN GOTO 1110
1130 IF C$=":" THEN GOTO 1110
1140 IF C$="|" THEN GOTO 1110
1150 IF C$="{" THEN GOTO 1110
1160 IF C$="}" THEN GOTO 1110
1170 IF C$="[" THEN GOTO 1110
1180 IF C$="]" THEN GOTO 1110
1190 IF C$="(" THEN GOTO 1110
1200 IF C$=")" THEN GOTO 1110
1210 IF C$="<" THEN GOTO 1110
1220 IF C$=">" THEN GOTO 1110
1230 IF C$=":" THEN GOTO 1110
1240 IF C$=";" THEN GOTO 1110
1250 IF C$="," THEN GOTO 1110
1260 IF C$="." THEN GOTO 1110
1270 IF C$="|" THEN GOTO 1110
1280 IF C$="{" THEN GOTO 1110
1290 IF C$="}" THEN GOTO 1110
1300 IF C$="[" THEN GOTO 1110
1310 IF C$="]" THEN GOTO 1110
1320 IF C$="(" THEN GOTO 1110
1330 IF C$=")" THEN GOTO 1110
1340 IF C$="<" THEN GOTO 1110
1350 IF C$=">" THEN GOTO 1110
1360 IF C$=":" THEN GOTO 1110
1370 IF C$=";" THEN GOTO 1110
1380 IF C$="," THEN GOTO 1110
1390 IF C$="." THEN GOTO 1110
1400 IF C$="|" THEN GOTO 1110
1410 IF C$="{" THEN GOTO 1110
1420 IF C$="}" THEN GOTO 1110
1430 IF C$="[" THEN GOTO 1110
1440 IF C$="]" THEN GOTO 1110
1450 IF C$="(" THEN GOTO 1110
1460 IF C$=")" THEN GOTO 1110
1470 IF C$="<" THEN GOTO 1110
1480 IF C$=">" THEN GOTO 1110
1490 IF C$=":" THEN GOTO 1110
1500 IF C$=";" THEN GOTO 1110
1510 IF C$="," THEN GOTO 1110
1520 IF C$="." THEN GOTO 1110
1530 IF C$="|" THEN GOTO 1110
1540 IF C$="{" THEN GOTO 1110
1550 IF C$="}" THEN GOTO 1110
1560 IF C$="[" THEN GOTO 1110
1570 IF C$="]" THEN GOTO 1110
1580 IF C$="(" THEN GOTO 1110
1590 IF C$=")" THEN GOTO 1110
1600 IF C$="<" THEN GOTO 1110
1610 IF C$=">" THEN GOTO 1110
1620 IF C$=":" THEN GOTO 1110
1630 IF C$=";" THEN GOTO 1110
1640 IF C$="," THEN GOTO 1110
1650 IF C$="." THEN GOTO 1110
1660 IF C$="|" THEN GOTO 1110
1670 IF C$="{" THEN GOTO 1110
1680 IF C$="}" THEN GOTO 1110
1690 IF C$="[" THEN GOTO 1110
1700 IF C$="]" THEN GOTO 1110
1710 IF C$="(" THEN GOTO 1110
1720 IF C$=")" THEN GOTO 1110
1730 IF C$="<" THEN GOTO 1110
1740 IF C$=">" THEN GOTO 1110
1750 IF C$=":" THEN GOTO 1110
1760 IF C$=";" THEN GOTO 1110
1770 IF C$="," THEN GOTO 1110
1780 IF C$="." THEN GOTO 1110
1790 IF C$="|" THEN GOTO 1110
1800 IF C$="{" THEN GOTO 1110
1810 IF C$="}" THEN GOTO 1110
1820 IF C$="[" THEN GOTO 1110
1830 IF C$="]" THEN GOTO 1110
1840 IF C$="(" THEN GOTO 1110
1850 IF C$=")" THEN GOTO 1110
1860 IF C$="<" THEN GOTO 1110
1870 IF C$=">" THEN GOTO 1110
1880 IF C$=":" THEN GOTO 1110
1890 IF C$=";" THEN GOTO 1110
1900 IF C$="," THEN GOTO 1110
1910 IF C$="." THEN GOTO 1110
1920 IF C$="|" THEN GOTO 1110
1930 IF C$="{" THEN GOTO 1110
1940 IF C$="}" THEN GOTO 1110
1950 IF C$="[" THEN GOTO 1110
1960 IF C$="]" THEN GOTO 1110
1970 IF C$="(" THEN GOTO 1110
1980 IF C$=")" THEN GOTO 1110
1990 IF C$="<" THEN GOTO 1110
2000 IF C$=">" THEN GOTO 1110
2010 IF C$=":" THEN GOTO 1110
2020 IF C$=";" THEN GOTO 1110
2030 IF C$="," THEN GOTO 1110
2040 IF C$="." THEN GOTO 1110
2050 IF C$="|" THEN GOTO 1110
2060 IF C$="{" THEN GOTO 1110
2070 IF C$="}" THEN GOTO 1110
2080 IF C$="[" THEN GOTO 1110
2090 IF C$="]" THEN GOTO 1110
2100 IF C$="(" THEN GOTO 1110
2110 IF C$=")" THEN GOTO 1110
2120 IF C$="<" THEN GOTO 1110
2130 IF C$=">" THEN GOTO 1110
2140 IF C$=":" THEN GOTO 1110
2150 IF C$=";" THEN GOTO 1110
2160 IF C$="," THEN GOTO 1110
2170 IF C$="." THEN GOTO 1110
2180 IF C$="|" THEN GOTO 1110
2190 IF C$="{" THEN GOTO 1110
2200 IF C$="}" THEN GOTO 1110
2210 IF C$="[" THEN GOTO 1110
2220 IF C$="]" THEN GOTO 1110
2230 IF C$="(" THEN GOTO 1110
2240 IF C$=")" THEN GOTO 1110
2250 IF C$="<" THEN GOTO 1110
2260 IF C$=">" THEN GOTO 1110
2270 IF C$=":" THEN GOTO 1110
2280 IF C$=";" THEN GOTO 1110
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2310 IF C$="|" THEN GOTO 1110
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2430 IF C$="." THEN GOTO 1110
2440 IF C$="|" THEN GOTO 1110
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2570 IF C$="|" THEN GOTO 1110
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3120 IF C$="[" THEN GOTO 1110
3130 IF C$="]" THEN GOTO 1110
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3250 IF C$="[" THEN GOTO 1110
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3270 IF C$="(" THEN GOTO 1110
3280 IF C$=")" THEN GOTO 1110
3290 IF C$="<" THEN GOTO 1110
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3610 IF C$="|" THEN GOTO 1110
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3740 IF C$="|" THEN GOTO 1110
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3810 IF C$="<" THEN GOTO 1110
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3870 IF C$="|" THEN GOTO 1110
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3980 IF C$="," THEN GOTO 1110
3990 IF C$="." THEN GOTO 1110
4000 IF C$="|" THEN GOTO 1110
4010 IF C$="{" THEN GOTO 1110
4020 IF C$="}" THEN GOTO 1110
4030 IF C$="[" THEN GOTO 1110
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4060 IF C$=")" THEN GOTO 1110
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4100 IF C$=";" THEN GOTO 1110
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4120 IF C$="." THEN GOTO 1110
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4240 IF C$="," THEN GOTO 1110
4250 IF C$="." THEN GOTO 1110
4260 IF C$="|" THEN GOTO 1110
4270 IF C$="{" THEN GOTO 1110
4280 IF C$="}" THEN GOTO 1110
4290 IF C$="[" THEN GOTO 1110
4300 IF C$="]" THEN GOTO 1110
4310 IF C$="(" THEN GOTO 1110
4320 IF C$=")" THEN GOTO 1110
4330 IF C$="<" THEN GOTO 1110
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4370 IF C$="," THEN GOTO 1110
4380 IF C$="." THEN GOTO 1110
4390 IF C$="|" THEN GOTO 1110
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4570 IF C$="(" THEN GOTO 1110
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5880 IF C$=")" THEN GOTO 1110
5890 IF C$="<" THEN GOTO 1110
5900 IF C$=">" THEN GOTO 1110
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5920 IF C$=";" THEN GOTO 1110
5930 IF C$="," THEN GOTO 1110
5940 IF C$="." THEN
```

**From Page 43**

	DP 17,0 JP 1,checkend	compare first char	LD 11,octal2 LD 17,hexdigits LD 5,0
END 441p	.endchar		
SET 7,(17-1) add 10 to last	INC 11		.fndloop1
**** Search ****	END 11loop JP searchloop		LD 5,(10-0) LD 8,(10+1) LD 8,0
LD 0,0000 print of basic LD 11,addr1,0	.checkend check following chars		.fndloop2
.searchloop	PSH 11 PSH 17 PSH 0C LD 4,baseaddr1 get base length LD 0,A pass it a counter		LD 0 INC 0,0C JP 0,find INC 0 JP fndloop2
LD 4,16 CALL 0000E SET 01 LD 11,11addr1 LD 5,(10-0) LD 8,(10+0)	.strdig		.fnd
LD 0,baseaddr,0C LD 5,(10+0) get line length LD 8,(10+0) LD 0,0 OR 0 if zero then finished SET 0	LD 4,(11) DP 17 JP 0,loop2 BIT 7,0 last char? JP 0,loop1 RES 5,0 JP 0,orig		ADD 0,0C LD 0,0 INC 11 INC 11 INC 0 INC 0 JP 1,print JP fndloop1
.orig1	.orig1		
PSH 0C PSH 11 MOV 11,0C find next line addr LD 11,addr1,0 POP 11 POP 0C LD 0C,4 MOV 11,0C find start prog data MOV 4 INC 0,0C no. bytes to search LD 4,baseaddr1 LD 5,0,LD 0,0 MOV 4 INC 0,0C pointer char used? JP 0,searchloop JP 1,searchloop LD 0,1 LD 0,0 LD 17,baseaddr	DP 115 (last char is 110) JP 0,orig1 RES 5,0  .orig2  DP 171 JP 01,credit (char1 is 01000) INC 11 INC 17 SUN1 strdig1  .credit  LD 0,0 (if counter=0 then DP 0 match found JP 0,matchfound POP 0C no match so resume POP 11 search at point POP 17 where left off JP 0,search		.print  LD 0,4 LD 11,hexdigits  .slip (strip leading zeros)  LD 4,(11) DP "0"-00 JP 01,print LD 11," "-00 INC 11 SUN1 slip  -000 (print number)  LD 0,0 LD 11,hexdigits-1  .prisp (with leading space)  LD 4,(11) MOV 40 (to get ASCII value) CALL 0000A INC 11 SUN1 prisp POP 0C
.lineloop search line			
LD 0,(11) 0 DP 01 lower case? JP 0,loop1 RES 0,0 pass upper case	**** Print Line No. **** .matchfound		
.loop1	LD 0,(11addr1)		

```

POP 01
POP 02
IF searchloop carry on

.dectable
DEFB 1000,1000,100,10,1
DEFB ' ' *40 (loading space)

.secdigits
DEFB 0

.numban
DEFB 1

.lisub
DEFB 2

.lisens
DEFB 3

.inventors
DEFB 40

**** (initialise R0's memory)

.membans
LD R0,flag
LD R1,
CP(R0), done before?
RET 3
LD(R0),1 (set flag)
LD R0,restable
LD R0,workspace
CALL MCON (log (R0))
RET

.restable
WORD restable:
JP rinst

.restable
DEFB 'R01R',0+400

```



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**I**n the March 1985 Cover-story with the *Amend* I showed how the screen could be dumped to the printer (including a hard copy of both text and graphics to be produced). I must admit it is a bit primitive, so I thought it was about time for an update.

The program presented here will produce a large dump — the width of A4 paper and about half as deep — of a Mode 0 or 1 screen. Each pixel is represented by different shades of gray. The Mode 0 dump is in 16 shades and the Mode 1 dump is in four shades.

Unfortunately all printers are different and there's no standard for control codes, so I can't guarantee that the dump won't work on some printers. We use Epson FX-80s here in the office and these are about as standard as you can get.

If your printer is Epson compatible there's a good chance of the program working. If it isn't you'll have to substitute different control codes in the assembly listing. Table 1 shows the codes used.

Program 1 is a Basic listing with the machine code stored in data statements. If you run this the code is stored above HOME which is moved down to \$0FFF.

Program 2 is an assembly listing of the code. If you've got an assembler you can assemble it to a different address if there's a memory clash with any other utilities.

To produce a normal dump of the screen CALL \$A000. This is best for graphs and charts, and draws on a white background. Some pictures will

# DOING UP OUR DUMPS



## ROLAND WADDILOVE updates his screen dump utility

look better if drawn on a black background, so CALL \$A000.1 for an inverse dump.

How does the dump work? Well it is actually fairly straightforward.

No doubt you are familiar with Basic's SYMBOL command for defining characters to print to the screen — well we can do the same

with printers.

Whereas SYMBOL requires eight bytes of data and the character defined is eight pixels wide the printer can accept many bytes of data and the character can be the width of the paper.

If the codes 27.76 are sent to the printer it tells it that the following bytes aren't Ascii codes to print, but are bytes of data instead.

It needs to know how many bytes to expect, so if we are going to send a byte of data we send a MOD 256 followed by a(256 to the printer. Then we can send the data which is printed in a similar manner to a user-defined character.

So if a byte of 66 was subsequently sent we wouldn't see a letter A printed, we would see a pattern of dots corresponding to binary 66 instead, 01000001. By the way, it is actually printed vertically.

At the end of the assembly listing you'll see a block of data. These are

Unidirectional printing	27."n".1
1/36 inch paper feed	27."n".2
Bit image mode	27."n".a MOD 256;n,256

Table 1. Printer control codes used

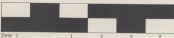


Figure 2. The pattern and data for the 66







## From Page 49

18 rows of six bytes, numbered from 0 to 15. The dump works by scanning each row of pixels across the screen.

If a pixel colour is pen 0 the six bytes of data in row 0 are sent to the printer. If a pixel is pen 1 the data in row 1 is sent. Pen 2 is row 2, pen 3 is row 3 and so on.

So for each pixel on the screen we send six bytes of data which are then interpreted and printed as a binary pattern.

By altering the data you can alter the pattern printed, hence the shade of grey produced for each pen. Figure 1 shows the data and pattern for pen 15, the last 0 bytes of data in the table.

Since there are 160 pixels across the Mode 0 screen there are 160 x 6 or 960 bytes of data sent per scan. Unfortunately we can't tell the printer to expect 960 MOD 256 = 940,256 bytes of data since 960 MOD 256 is 192 and the Amstrad chops off bit 7,

sending 84 instead.

Therefore each row of pixels is split in two so that the number of items of data to send in either section MOD 256 is less than 128. This is why you'll see the printer print about 2/3 of the row, pause slightly and then print the rest.

Since only one row of pixels is

scanned at a time the paper feed is reduced so that there aren't any gaps left between lines.

A Mode 1 dump is almost identical to a Mode 0 dump, so the routine looks to see what mode it's in and then modifies itself accordingly.

A mode 2 dump is pretty similar, so I'll leave that up to you. ■



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Amstrad 486/58	£10.00	£10.00		
Amstrad 486/59	£10.00	£10.00		
Amstrad 486/60	£10.00	£10.00		
Amstrad 486/61	£10.00	£10.00		
Amstrad 486/62	£10.00	£10.00		
Amstrad 486/63	£10.00	£10.00		
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Amstrad 486/68	£10.00	£10.00		
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Amstrad 486/70	£10.00	£10.00		
Amstrad 486/71	£10.00	£10.00		
Amstrad 486/72	£10.00	£10.00		
Amstrad 486/73	£10.00	£10.00		
Amstrad 486/74	£10.00	£10.00		
Amstrad 486/75	£10.00	£10.00		
Amstrad 486/76	£10.00	£10.00		
Amstrad 486/77	£10.00	£10.00		
Amstrad 486/78	£10.00	£10.00		
Amstrad 486/79	£10.00	£10.00		
Amstrad 486/80	£10.00	£10.00		
Amstrad 486/81	£10.00	£10.00		
Amstrad 486/82	£10.00	£10.00		
Amstrad 486/83	£10.00	£10.00		
Amstrad 486/84	£10.00	£10.00		
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Amstrad 486/94	£10.00	£10.00		
Amstrad 486/95	£10.00	£10.00		
Amstrad 486/96	£10.00	£10.00		
Amstrad 486/97	£10.00	£10.00		
Amstrad 486/98	£10.00	£10.00		
Amstrad 486/99	£10.00	£10.00		
Amstrad 486/100	£10.00	£10.00		

### AMSTRAD 486/100

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# DISCOUNT SOFTWARE

## CHECK OUT THESE PRICES

NAME	PRICE	NAME & PRICE	NAME & PRICE
Amstrad 486	199.00	Accounting 1	199.00
Amstrad 586	299.00	Accounting 2	199.00
Amstrad 686	399.00	Accounting 3	199.00
Amstrad 8086	499.00	Accounting 4	199.00
Amstrad 9086	599.00	Accounting 5	199.00
Amstrad 10086	699.00	Accounting 6	199.00
Amstrad 11086	799.00	Accounting 7	199.00
Amstrad 12086	899.00	Accounting 8	199.00
Amstrad 13086	999.00	Accounting 9	199.00
Amstrad 14086	1099.00	Accounting 10	199.00
Amstrad 15086	1199.00	Accounting 11	199.00
Amstrad 16086	1299.00	Accounting 12	199.00
Amstrad 17086	1399.00	Accounting 13	199.00
Amstrad 18086	1499.00	Accounting 14	199.00
Amstrad 19086	1599.00	Accounting 15	199.00
Amstrad 20086	1699.00	Accounting 16	199.00
Amstrad 21086	1799.00	Accounting 17	199.00
Amstrad 22086	1899.00	Accounting 18	199.00
Amstrad 23086	1999.00	Accounting 19	199.00
Amstrad 24086	2099.00	Accounting 20	199.00
Amstrad 25086	2199.00	Accounting 21	199.00
Amstrad 26086	2299.00	Accounting 22	199.00
Amstrad 27086	2399.00	Accounting 23	199.00
Amstrad 28086	2499.00	Accounting 24	199.00
Amstrad 29086	2599.00	Accounting 25	199.00
Amstrad 30086	2699.00	Accounting 26	199.00
Amstrad 31086	2799.00	Accounting 27	199.00
Amstrad 32086	2899.00	Accounting 28	199.00
Amstrad 33086	2999.00	Accounting 29	199.00
Amstrad 34086	3099.00	Accounting 30	199.00
Amstrad 35086	3199.00	Accounting 31	199.00
Amstrad 36086	3299.00	Accounting 32	199.00
Amstrad 37086	3399.00	Accounting 33	199.00
Amstrad 38086	3499.00	Accounting 34	199.00
Amstrad 39086	3599.00	Accounting 35	199.00
Amstrad 40086	3699.00	Accounting 36	199.00
Amstrad 41086	3799.00	Accounting 37	199.00
Amstrad 42086	3899.00	Accounting 38	199.00
Amstrad 43086	3999.00	Accounting 39	199.00
Amstrad 44086	4099.00	Accounting 40	199.00
Amstrad 45086	4199.00	Accounting 41	199.00
Amstrad 46086	4299.00	Accounting 42	199.00
Amstrad 47086	4399.00	Accounting 43	199.00
Amstrad 48086	4499.00	Accounting 44	199.00
Amstrad 49086	4599.00	Accounting 45	199.00
Amstrad 50086	4699.00	Accounting 46	199.00
Amstrad 51086	4799.00	Accounting 47	199.00
Amstrad 52086	4899.00	Accounting 48	199.00
Amstrad 53086	4999.00	Accounting 49	199.00
Amstrad 54086	5099.00	Accounting 50	199.00
Amstrad 55086	5199.00	Accounting 51	199.00
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Amstrad 67086	6399.00	Accounting 63	199.00
Amstrad 68086	6499.00	Accounting 64	199.00
Amstrad 69086	6599.00	Accounting 65	199.00
Amstrad 70086	6699.00	Accounting 66	199.00
Amstrad 71086	6799.00	Accounting 67	199.00
Amstrad 72086	6899.00	Accounting 68	199.00
Amstrad 73086	6999.00	Accounting 69	199.00
Amstrad 74086	7099.00	Accounting 70	199.00
Amstrad 75086	7199.00	Accounting 71	199.00
Amstrad 76086	7299.00	Accounting 72	199.00
Amstrad 77086	7399.00	Accounting 73	199.00
Amstrad 78086	7499.00	Accounting 74	199.00
Amstrad 79086	7599.00	Accounting 75	199.00
Amstrad 80086	7699.00	Accounting 76	199.00
Amstrad 81086	7799.00	Accounting 77	199.00
Amstrad 82086	7899.00	Accounting 78	199.00
Amstrad 83086	7999.00	Accounting 79	199.00
Amstrad 84086	8099.00	Accounting 80	199.00
Amstrad 85086	8199.00	Accounting 81	199.00
Amstrad 86086	8299.00	Accounting 82	199.00
Amstrad 87086	8399.00	Accounting 83	199.00
Amstrad 88086	8499.00	Accounting 84	199.00
Amstrad 89086	8599.00	Accounting 85	199.00
Amstrad 90086	8699.00	Accounting 86	199.00
Amstrad 91086	8799.00	Accounting 87	199.00
Amstrad 92086	8899.00	Accounting 88	199.00
Amstrad 93086	8999.00	Accounting 89	199.00
Amstrad 94086	9099.00	Accounting 90	199.00
Amstrad 95086	9199.00	Accounting 91	199.00
Amstrad 96086	9299.00	Accounting 92	199.00
Amstrad 97086	9399.00	Accounting 93	199.00
Amstrad 98086	9499.00	Accounting 94	199.00
Amstrad 99086	9599.00	Accounting 95	199.00
Amstrad 100086	9699.00	Accounting 96	199.00
Amstrad 101086	9799.00	Accounting 97	199.00
Amstrad 102086	9899.00	Accounting 98	199.00
Amstrad 103086	9999.00	Accounting 99	199.00
Amstrad 104086	10099.00	Accounting 100	199.00

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# MicroLink

Your personal passport to the world of communications with

**TELECOM GOLD**

Published in conjunction with British Telecom's TELECOM GOLD

## What it offers the Amstrad user...

### Electronic mail is much cheaper than the post

Sending e-mail messages to other subscribers, whose numbers are rapidly growing, is the cheapest form of communication possible. You can send a message of any length to another mailbox for less than the cost of a first class stamp. And it doesn't cost a penny more to send the same message to 500 different mailboxes. Even a message sent to a mailbox on the other side of the world only costs 30p.

### The biggest bulletin board of them all

The number of bulletin boards is growing rapidly. The only snag is that the vast majority are single user boards - which means lots of other people are also trying to make contact and all too often all you get is the engaged tone. But with the MicroLink bulletin board there is no limit to the number of people using it at the same time, and no limit to the number of categories that can be displayed on the board.

### Give your micro mainframe power

With MicroLink your micro becomes a terminal linked directly to the Telecom Gold mainframe computer, and able to tap its tremendous power and versatility. Right away you'll be able to use giant number-crunching programs that can only run on a mainframe.

### The mailbox that is always open

MicroLink is open 24 hours a day, every day. That means you can access your mailbox whenever you want, and from wherever you are... home, office, airport - even a hotel bedroom or golf club! Please note to know where you are when you send your message.

### We're only a local phone call away

The majority of MicroLink subscribers are connected to our mainframe computer in London by making a local phone call. This is possible because they use British Telecom's PSE system, which has access points all over Britain. A local phone call is all you need, too, for direct access via MicroLink to all the other countries belonging to the international Dialcom system.

### Telemessages - at a third off

The modern equivalent of the telegram is the telemessage. Send it before 10pm and delivery is guaranteed by first post the following day (except Sunday). The service was intended for people phoning their message to the operator, which costs £3.50 for 50 words. But you can now use it via MicroLink, for only £1.25 for up to 200 words! For an extra 50p your message can be delivered in an attractive greetings card.

### Go teleshopping on your micro

With MicroLink you can study the British Rail timetable - and then buy your ticket in advance. You can book theatre tickets. And even order a couple of flowers. It's all part of the tele-shopping revolution!

### Send and receive telex messages

With MicroLink you can run your micro into a telex machine, and can send and receive telex messages of any length. You will be able to communicate directly to 95,000 telex subscribers in the UK, 14 million worldwide - and even with shops all over the telex machine network. Business people can now send and receive telexes after office hours, from home or when travelling.

### What does it all cost?

Considering all the services you have at once, MicroLink is remarkably inexpensive. You pay a once-only registration fee of £5, and then a standing charge of just £2 a month. On-line rates are 3.5p a minute (between 7pm and 8am) or 1.1p a minute during office hours. There is an additional 2.5p a minute PSE charge if you are calling from outside the UK. London call area. Charges for telex, telegrams and storage of files are given on the next page.

# How much it costs to use MicroLink

**Initial registration fee:** £5.

**Standing charge:** £1 per calendar month or part.

**Connect charge:** 15p per minute or part - cheap rate; 11p per minute or part - standard rate.

Applicable for duration of connection to the Service Minimum charge: 1 minute.

Chase rate is from 9pm to 6am, Monday to Friday, of any locality, and Sunday and public holidays (standard rate is from 9am to 5pm, Monday to Friday, including public holidays).

**Filing charge:** 25p per unit of 2,000 characters per month.

Applicable for storage of information, such as text, short messages and faxes. The number of units available is always calculated by reference to a daily sample.

### Informational Databases: Various charges.

Any charges that may be applicable are shown to you before you obtain access to the database.

**MicroLink FMS service:** 25p per minute or part (2000 baud); 3p per minute or part (2000/75 baud).

On-top-up charges outside the UK London only.

**Telnet registration:** £10.

**Outgoing rates:** 15p per 100 characters (FMS); 11p per 100 (Europe); 35p per 100 (US, America); £1.25 per 100 (Rest of world); £2.75 per 400 (Ship, at sea).

Capital messages sent on the night service are subject to a 75 per cent discount.

**Incoming rates:** 50p for each correctly addressed letter delivered to your mailbox. Obtaining a mailbox reference from the number listed is further charge of 50p.

It is not possible to obtain a new address a mailbox reference. If a letter is received without a mailbox reference the sender will be advised of non-delivery and asked to provide a mailbox address.

Each user entitled to use and using the facility will incur a charge of 6 storage units a month. Further storage charges could be incurred depending on the amount of letter storage used and the use made of short code and message file facilities.

### Telemessages: £1.25 for up to 500 words.

Telemessages can be sent with an unlimited postage card for 45p extra.

### Postalposting No charge.

If you use a BT Mailbox you can be posted automatically whenever a message is waiting in your mailbox.

### International Mail: For the first 2,000

characters - 35p to Germany and Denmark; 50p to USA, Australia, Canada, Singapore, Hong Kong and Israel. For additional 2,000 characters - 15p/15p.

These charges relate to the transmission of information by the Telex service to other Telex services outside the UK and the use of Air Mail. Multiple copies addressed to the same system feature only one transmission charge.

**Billing and Payment:** All charges quoted are exclusive of VAT. Currently, all bills are rendered monthly.

## Software over the telephone

MicroLink is setting up a central store of software programs which you'll be able to download directly into your system. The range will include games, utilities, educational and business programs, and will cover all the most popular areas of interest.

## Talk to the world - by satellite

MicroLink is part of the International Telexnet network. In the USA, Australia and a growing number of other countries there are many thousands of users with electronic mailboxes just like yours. You can contact them just as easily as you can write in Britain - the only difference is that the messages leave your keyboard going around the world via satellite.

## What you need to access MicroLink

You must have three things in order to use MicroLink: a computer (it can be any make of micro, hand held device or even an electronic message transmitter provided it has communications facilities), a modem (it can be a simple Hayes type using 1200/75 baud, or a more sophisticated one operating at 9600/300 or 1200/1200 baud), and appropriate communications software.

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0704

☐ We hereby apply to join MicroLink.

☐ I/We I authorize my cheque for £40 payable to Database Publications as registration fee to MicroLink.

☐ I/We I/We wish to use Telex. I authorize you to charge an additional £10 to my initial bill for activation.

☐ I declare that I am over 18 years of age.

☐ I confirm that I have the best qualifications for the use being to form a copy of which are available on request.

Signature \_\_\_\_\_

Date \_\_\_\_\_

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Please indicate month of commencement

Allow 10 days for activation of mailbox

19

### Payment

Initial Database Publications cheque (the supplier of all the services to you, the communication and

billing thereof) will be provided by Telecom Gold as agent for Database Publications Ltd.

Date of first payment to be on 10th of month following commencement.

Please complete billing information form A, B or C below.

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I/We authorize you until further notice in writing to charge to my/our account with you on or immediately after 10th day of each month (subject to amounts which may be debited) (except at the instance of Bank) Telecom Gold amount of: TELECOM GOLD £50 per month (to be raised 10 days before date is processed).

Name of Account to be debited

Account Number

When the press use such words as "Phenomenal," "Chlorinating," "Total" and "North East Perry," they've obviously discovered something rather special.

But when they see writing special forms set to be a product in which they are already expert, then it must be something very special indeed.

The object of this introduction to AMX Pagemaker — a revolutionary software program that will produce newspapers, posters, leaflets, notices and hand-outs — is in fact anything where text and graphics are required, in an extraordinary professional standard.

It's a complete graphics design system and word processor rolled into one. It has real time graphics with live continuous scrolling up and down an A4 page and uses Mode 2, the highest graphics resolution on the Amstrad CPC computers.

### READ ALL ABOUT IT

You can type directly onto the screen, with any of the 15 typefaces supplied or design your own, alternatively, you can load in any ASCII form-a-word processor file. Your programs such as Fontwork, Fontmaster, Master, or ProFont, with fully automatic on-screen text formatting during editing.

Word processing facilities such as automatic, tagged right and final justification are all available. There's a full page resolution control over text and graphics. Also included is a macro-spacing facility.



# The program that's making front page news.

### EXTRA...EXTRA...

There are outstanding facilities for drawing, scanning and printing, using either the patterns supplied, or your own pattern designs. A screen conversion system is included allowing screens resolution in Mode 1 and 2 to be used within the Pagemaker. The cut and paste facilities include copying, moving, rotating, stretching and horizontal zoom in use available.

The program allows you to view three A4 pages at any time before work is output to a file or to a dot matrix printer available. Amstrad/OSMP (0050-0050) Epson (7000/8100), Canon (P4, 5000), Sage (5700), Microstrat (July 87-88) or Sekonia (2F-2000A, Star Delta, Star 5021) and any that are compatible with the above.

The AMX Pagemaker supports all Amstrad CPC/610 (8 or 16) Amstrad CPC/640 — 64K Minimum add-on-Ram or 1) Amstrad CPC/640 + 64K Minimum add-on-Ram + also other 16K fonts. Ram-boards or compatibles.

Let's leave the last word to the press. "Pagemaker" is phenomenal... It enabled us to create anything where text and graphics are involved — notices, posters, leaflets, hand-outs, newsletters. Packages like this have been the product of the 20-odd years of our life, this product is worth every penny of £49.95.

### AMX MAGAZINE MAKER - WE'LL SHOW YOU HOW TO USE A MAGAZINE IN THE PICTURE

A combination of AMX Pagemaker and the AMX video digitiser. Using any video that provides a compatible signal and the digitiser, images from a camera or TV can be converted into a graphic screen on the Amstrad/OSMP. They can then be used within AMX Pagemaker to produce magazines or newsletters. The digitiser connects into the expansion port and scans a complete picture in only 2 seconds.

A special panel during editing is also included with this clever program. This is specially designed to produce fast, correctly proportioned pictures, with reduced 'Contouring' resulting in a very accurate reproduction of the image.

- Features offered for this package include:
- 100 resolution 256 by 256
  - Standard 1 volt compatible video input
  - 15 bit A/D converter gives 32 grey scale output
  - Low 40 ms/line
  - Contrast and brightness control
  - No external power unit required

These packages are your opportunity to join the desktop publishing revolution.

The AMX Pagemaker costs only £49.95, software is supplied on 5" disc and a fully illustrated

counting manual, AMX Optimiser only £29.95 including software on 5" disc, and AMX Magazine Maker including AMX Pagemaker and AMX Optimiser at only £129.95.

These superb packages are available from all good computer dealers or direct using the Request order form below. (Cheques payable: name only)

NAME OF THE STORE OR THE COMPANY AND ADDRESS

NAME \_\_\_\_\_ ADDRESS \_\_\_\_\_

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☐ FOR INSTANT ACCESS OR VISA ORDERS RING 0925-413600/0/3

**AMX PAGEMAKER**

REGISTRATION AT YOUR LOCAL SHOP

SEND TO: AMSTRAD/OSMP/AMX PAGES/110, 110/110/110, AMSTRAD/OSMP/AMX PAGES/110

# Pull the other one - fast

A CPC6128 utility by LAWRENCE ROWE

**P**ULL-DOWN menus are definitely "in" and no program of any standing can afford to be without them. For best effect the pull-down needs to be fast and smooth and this is not so easy on the Amstrad, with its slow printing on screen.

One obvious solution on the CPC6128 is to store the menus in the spare RAM and to use the Bank Manager routines to copy them to the screen when required. Unfortunately Bank Manager can really only move whole screens, which makes it

unhelpful for single menus.

Another difficulty arises from the fact that the copying is done in one continuous run from start to finish, and because of the way the screen is mapped to memory this causes the infamous vertical blind appearance.

We need a set of routines that can copy the contents of a selected window between the screen and banks 2 to 5 with a nice, even pull-down.

Before a menu can be pulled from one of the banks of spare RAM it must obviously first be put in there, and all

this cunning is going to be wasted if the only way to do that is first to print it out on the screen in full view.

So it would be handy if there were a way of printing, or plotting, or whatever, directly into the spare RAM without ever going on the screen. Of course you wouldn't be able to see what you were printing at the time, but you would have tried it out on the screen beforehand to make sure that your program was properly debugged.

PULLM is a suite of routines for the CPC6128 that provides all these facilities. Program 1 writes the machine code, checks that it is correct and, when it is, saves it to disc as PULLM.C6128.BIN. Program 2 is the program which will load and initialise the R50s. Type it in and save it on the disc as PULLM.R50.

The code is completely relocatable, so it can be loaded and run regardless of the value of HIMEM as long as it is not below 8000. After it has been called, the relocating routine is no longer needed and the space is reclaimed. You will now have a set of four R50s, and one CALL.

The first three R50s, PUSHRM, PULLM and SDAWRM, move data between the spare RAM and the screen. They all have the same

```

1 R00 Pull Down Menu
2 R01 By Lawrence Rowe
3 R02 (C) Computing with the Amstrad
4 R03
5 R04M 0177F,00000000
6 R05 000 000 00 00000000 00 00
7 R06 00 00 00 00 0000 00 00 00
8 R07 00 00 00 00 0000 00 00 00
9 R08 00 00 00 00 0000 00 00 00
10 R09 00 00 00 00 0000 00 00 00
11 R10 00 00 00 00 0000 00 00 00
12 R11 00 00 00 00 0000 00 00 00
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# Software

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ON PAGE 67



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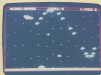
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Zareba

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C88





## From Page 69

most are the IX and IY registers, two 16 bit register pairs which behave very much like the HL pair.

In fact a good general rule is that if you can do it with the HL register pair you can do it with IX and IY. We tend to use them to point at memory locations, in much the same way as we do with HL.

So just as you can LD HL,&1234 so you can LD IX,&1234 and LD IY,&1234. Similarly as you can INC HL so you can INC IX and INC IY.

The difference comes when we use IX to point to something. Remember when we used HL to point to a memory location we used HL in brackets to signify this, as in LD HL,A, which copied the value in A into the location pointed at by HL.

With IX and IY, though, when you're pointing at memory like this not only do you put the register in brackets, but also an offset at displacement number. For instance:

```
LD IX,&7FFF
LD IX+1,A
```

would copy the value of A into memory location &7FFF (&7FFF+1). Similarly:

```
LD IX,&7FFF
LD IX-3,A
```

would copy A into &7FFF (&7FFF-3). What's inside the brackets still points at memory, it's just that you have to do a sum to get at it — contents of register plus offset.

So how do you point directly at the location stored in IX or IY? It couldn't be simpler — just use an offset of zero as in:

```
LD IX+0,A
and
LD A,(Y+0)
```

When we use our zero offset to point at memory like this IX and IY act just as HL. In fact we can use IX+0 and IY+0 to replace (HL).

Take a look at Program II. This stores the value &FF in the first four bytes of Haver's workspace. It shouldn't give you too much difficulty working it out.

Now try Program III. Here instead of pointing to memory with HL as in:

```
LD (HL),
```

```
Prog... 2      ORG 0000
0000:          .workspace+67FF
0000:00 FF      LD A,&FF
0000:01 FF FF   LD IX,workspace
0000:02 FF      LD (IX),A
0000:03        INC IX
0000:04 FF      LD (IX),A
0000:05        INC IX
0000:06 FF      LD (IX),A
0000:07        INC IX
0000:08 FF      LD (IX),A
0000:09        INC IX
0000:0A        RET
0000:         END
```

Program II

I've used IX with:

```
LD IX+0
```

Then to step through memory I've replaced:

```
INC HL
```

with:

```
INC IX
```

The results of the two programs are identical.

Program IV also accomplishes the same thing, except that instead of increasing IX to point to successive bytes of memory we simply use the same load instruction, but with different offsets:

```
LD IX+0,A
```

loads the accumulator into &7FFF. Then:

```
LD IX+1,A
```

```
Prog... 3      ORG 0000
0000:          .workspace+67FF
0000:00 FF      LD A,&FF
0000:01 FF FF   LD IX,workspace
0000:02 FF 00   LD (IX+0),A
0000:03 01     INC IX
0000:04 FF 00   LD (IX+1),A
0000:05 02     INC IX
0000:06 FF 00   LD (IX+2),A
0000:07 03     INC IX
0000:08 FF 00   LD (IX+3),A
0000:09 04     INC IX
0000:0A 05     LD (IX+4),A
0000:0B 06     RET
0000:         END
```

Program III

```
Prog... 2      ORG 0000
0000:          .workspace+67FF
0000:00 FF      LD A,&FF
0000:01 FF FF   LD IX,workspace
0000:02 FF 00   LD (IX+0),A
0000:03 01     LD (IX+1),A
0000:04 FF 00   LD (IX+2),A
0000:05 02     LD (IX+3),A
0000:06 03     RET
0000:         END
```

Program IV

loads it into &7FFF and so on. If you look carefully at the code generated by the assembler you'll readily see from the pattern how the opcodes for the different displacements are formed.

Notice that while Program II wastes least memory, Program IV scores over Program III in this respect. Another advantage of Program IV is that at its end the register you're using the pointing with — IX — hasn't been altered.

However I want you to do some alterations now. Both Programs III and IV used the IX register. I want you to adapt them so that they use the IY register.

If you look at Program V you'll see that it too is adapted. This time we've altered Program I so that it uses the IX register to point to the letter of the string we're printing out at the moment. To do this we've replaced:

```
LD HL,aring
```

with:

```
LD IX,aring
```

Then in the loop print:

```
LD A,(HL)
```

becomes:

```
LD A,(IX+0)
```

and:

```
INC HL
```

changes to:

```
INC IX
```

Perhaps the most common mistake people make is to forget that when you're pointing to memory with IX and IY you need to specify a

displacement, even if it's only zero.

This displacement is what makes these register pairs useful. Take a look at Program VI. This is virtually identical to Program V, except that we use:

```
LD A, IX+3)
```

instead of:

```
LD A, IX+0)
```

However we still:

```
LD IX, string
```

This means that the first time through the loop we don't start by loading the A register with the contents of location string-2, but with those of location string-3.

In other words we don't start at the first letter of the string but at the fourth. If you do the same you'll see that this works out to be the second of its message.

You should also note that I've allowed for standing further into the string by changing the value of length - my loop variable - to six instead of nine. The net result is that it prints out the tail part of message, which is safe.

Once you've worked out what's happening by altering Program VI so that it uses the IX register instead of IX, and also so it prints out age

```

Pass... 2      000 00000

0000:          .CharOut+0004
0001:          .length

0004:06 0F      LD B,length
0005:00 31 15 00 LD IX,string
0006:00 0A 00 00 CALL print
0007:07          RET
0008:          .print
0009:00 7E 00      LD A,(IX+0)
000A:00 5A 00 00 CALL CharOut
000B:00 33        INC B
000C:00 16 04 00 SBC print
000D:07          RET
000E:          .string
000F:          SDF 'message'
0010:00          SDF 33
0011:00          SDF 30
0012:          END
```

Program V

```

Pass... 1      000 00000

0000:          .CharOut+0000
0001:          .length

0004:06 0A      LD B,length
0005:00 31 15 00 LD IX,string
0006:00 0A 00 00 CALL print
0007:07          RET
0008:          .print
0009:00 7E 00      LD A,(IX+0)
000A:00 5A 00 00 CALL CharOut
000B:00 33        INC B
000C:00 16 04 00 SBC print
000D:07          RET
000E:          .string
000F:          SDF 'message'
0010:00          SDF 33
0011:00          SDF 30
0012:          END
```

Program VI

instead of age.

I can remember my first encounter with these LD (IX + d) type instructions - d being the displacement. I kept looking for ways to vary d, such as an INC d instruction, but no such instruction exists. Believe me I've looked. Bear in mind though you can always INC IX.

There is another point about d - it's a relative displacement. That is, if d is in the range 0 to 127 (&FF) the displacement is simply added on to the IX or IY register.

However numbers in the range 128 (&80) to 255 (&FF) are decoded as negative numbers in the range -128 to -1 before being added to the address in the register. In this case you'll be pointing to addresses before the location IX or IY point to in memory.

We've met this kind of coding for negative numbers before, where a displacement was given after a JR.

It's known as two's complement arithmetic and is simply a convention based on the fact that if you add &FF to a number the result is that number minus one. This works if you remember that adding one to &FF takes us round the clock to zero again, so the sum:

$$\text{number} + \&FF$$

gives us:

$$\text{number} - 1 + 1 + \&FF$$

which boils down to:

$$\text{number} - 1 + 0$$

leaving us with:

$$\text{number} - 1$$

That is, since  $1 + \&FF = 0$  as far as a byte is concerned adding &FF to a number is equivalent to adding minus one, so we can represent -1 as &FF.

The same reasoning works for &FE as -2 and so on. We have to call a halt somewhere, so when we get to -128 (&80) - halfway through a byte - we stop, otherwise we'd have no numbers left to represent positive numbers. This all adds up to the fact that:

$$\text{LD A,(IX+\&FF)}$$

will load the A register with the contents of the address one byte before that given in IX since &FF is equivalent to minus one.

Program VII illustrates this idea, again labels the location of E in the string ABCDEF0H. At the start of the

```

Pass... 3      000 00000

0000:          .CharOut+0004

0004:00 31 0F 00 LD IX,ageint
0005:00 7E 00 00 LD A,(IX+0FF)
0006:00 5A 00 00 CALL CharOut
0007:07          RET
0008:          SDF 'AGE'
0009:          .ageint
000A:          SDF '0H'
000B:          END
```

Program VII

program we load IX with the value of ageint. When we:

$$\text{LD A,(IX+\&FF)}$$

the A register is loaded with the contents of the byte before ageint - that is, the Ascii for D. This should explain the output of the program to you. Try altering it so that it prints out the A.

That's all for now. Next month we'll continue with our look at the IX and IY registers, and also see how the stack can be used to print our messages.





# When it makes good sense to GOTO

I MUST started to use the program *Alan Skipper* in your *June issue*.

I had noticed that all your programmers, even Roland Waddell's good chess files, use *RAWs* to good effect — except for one thing.

When they use a *GOTO* or a *GOSUB* command they nearly always send it to a *RAW*. In my opinion this is rubbish.

Why send it to a *RAW* or *RAMs* when they will simply be ignored, taking up precious time?

This is a good tip for fellow programmers — *RAWs* can sit in a program without being executed, thus taking up space at 80 bits, with the *Assemblers* making very little space as well. **Duncan Forrest, Warley, West Midlands.**

■ Where speed isn't critical it makes good sense to *GOTO* or *GOSUB* a *RAM* statement.

If you come across a *GOSUB* *0000* in a program it's easy to list *0000* and get a description of what the sub-routine is actually doing.

The time taken to execute a *RAM* statement is very small and usually not noticeable.

## Down in the dumps

In your February 1985 issue, you published a program by P.L. Waddell's, Variable Dump.

I tried to run this, using the standard listing, with *MY Waddell's RAW Assembler* from the July 1985 issue.

I found that *RAW* does not recognise the lines:

```
DATA 'OK',01,10,0
DATA 'WADD', 'P'+400
LET @RAW=+1
```

Can you say if my use of the assembler is likely to be wrong or if I am wrong, and if *Waddell* changed his rules?

I am, incidentally, using the cassette version of *RAW* as supplied by you. — **P. Mabin, Colne, Lancs.**

■ Variable Dump was written

using *Amor's* assembler and not *RAW*. *RAW* is fine for entering short assembly language programs, but is very slow.

Due to lack of time *Roland* used *Amor* instead which is much quicker.

All assemblers are different, with their own syntax. Programs written using one type of assembler cannot be entered into another without some sort of conversion — usually minor.

For instance:

```
DATA 'OK',01,10,0
```

using *Amor* converted to *RAW* would be:

```
DATA 'OK'
DATA 01
DATA 10
DATA 0
```

As you can see *RAW* is a bit long winded.

```
LET array = 01
```

is a bit more tricky. You'll have to delete from the listing and put at the start:

```
array=address
```

where address is the address of the next byte +1 following 100.

```
LET array = 01
```

## Raw assembler

I MUST thank *Roland Waddell* for his prompt reply to my letter concerning *Raw* assembler.

Thanks to the very simple example he included in his letter I now can only have the *RAW* of it, but have also approximately used it to run *Mike White's* *Bitlines* in his tutorial articles.

What I don't know before was the importance of the following points — it took a while before the second and

fourth of them filtered through the fog.

Firstly reserve space for the machine code before loading *Raw*. Second using *Load 'RAW'*, and not *Run 'RAW'*.

Thirdly prefix each statement with *DATA*, and finally use upper case letters — except for *And's*. — **Maxine Knight, Winchester, Hants.**

## Patience rewarded

*MICHAEL* came from *John Peabody* can take heart — I have just discovered that *Amor* do reply to queries.

I got a letter the other day, dated May 13, which started with "Thank you for your letter of 13th January 1985".

I just takes patience. I now feel *Howard's* paging a series of letters at irregular intervals in reply to my letter up enquiries.

I like reading *Roland Waddell's* articles, but his statement in his article on  *Pascal* in the *June* says that "Basil" is just a Mickey Mouse for the *RAW* is a blatant rubbish.

It makes one doubt the rest of the article, especially when he has to try so hard to show that *Pascal* is better.

He manages to make paging *DEFINT* A-Z at the beginning of a program — which many people do automatically — appear difficult by saying "Turning Basil to use an integer".

Apparently you need to set a variety of compiler options and toggle error checking before you can do it.

Let Basil be the not include the almost mandatory very badly written *Basic* program which so many authors seem to think is necessary to show that *Pascal* is better.

What is so wrong with *Pascal* that people feel they cannot just describe it and

then it is used, but always then to denigrate other languages? *Roland Waddell* even rates a review in *Lisp* and *Fort* as well.

Incidentally the *Hi-Soft* version of *C* seems to be a lot faster than their  *Pascal Counting* from 0 to 1,000,000 takes only 2.8 seconds — about 12 times faster than *Pascal's* 1 second for 30,000. — **J. Howard Wright, Cleeve-on-wedmore.**

## Paging . puzzles

I AM a computer programmer and have been the proud owner of a *1210* since they were released. I am forever puzzled by the paging system used by the computer.

I understand that many *RAMs* may be mapped on to the top area of *RAM* — *0000* to *FFFF* hex — and that each one is given a unique number to identify it.

Calling the appropriate machine with this number enables or disables the required *RAM*, as is clearly explained in the *404* *Hardware* manual.

When I get stuck I have the system use its *RAM* of page *0000*, this is mapped in the same way as *RAM* with an individual number and, if so, what are the relevant numbers to map these blocks in and out of memory?

I would like to be able to use this memory to hold machine code (which can be switched in and out as necessary).

Also what is the amount of memory that the *RAW* (*Y*) needs for its own use, excluding the *2k* buffer it needs when loading — in other words the difference between the lower and upper cable addresses when initializing *RAW* *Y*?

In exchange for this info-

## From Page 73

motion I would like to detail a method of creating invisible lines in Basic code.

The first stage is to type in the code you want to make available on to the rest of an existing, but short, line - for example:

```
10 TAB:: print"hello"
```

The code is added over three columns, then two spaces before the code. Only one command per line is possible.

By joining memory from 300 onwards a pattern of three zeros is loaded in, and when found the first two zeros are passed over the screen. This has the effect of causing a hole and of line marker for the Basic interpreter.

On doing the test after the column will not be printed but will execute. To remove the line either edit the line - which will destroy it altogether - or repeat the zero with ones - Howard G. Saper, Redwood, Cleveland.

■ The CPC4128 has four banks of RAM, each 128 bytes. These are numbered -1 to -4 and are mapped into the address space between \$4000 and \$7FFF.

To select a bank load the A register with the bank number and call \$B058. Save the A register and flags. When you've finished restore the original RAM state by restoring AP and calling \$B058 again.

The routines below show

```
*****
: CPC4128 Screen Save
*****

000 04000

:save
LD B,-1      select bank
CALL $B058  switch in
PUSH AF     save flags
LD HL,$4000 copy screen
LD B,2      to bank RAM
LD C,2
LD HL,$2000
LD B

POP AF      get flags
```

## Computing with the **AMSTRAD** Postbag.

WE welcome letters from readers - about your experiences using the Amstrad, about tips you would like to pass on to other users... and about what you would like to see in future issues.

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how a screen may be stored in a bank of RAM and recalled at any time. In fact even Control + Shift + Escape will not destroy it.

## Recipe for trees

I HAVE tried out your various attempts to construct binary trees using Basic. Here is my own using DR Logo.

Just load Logo, type in the two procedures listed, then type:

```
tree 1
```

with N between 20 and 60 for best results. A quite realistic symmetrical tree will be drawn in random colours.

The procedure tree1 is recursive - it calls itself - and is far more elegant than anything Basic can manage. Change any of the angles or the scale factor - .75 - to

produce different trees. - A.M. Scott, Grangemouth, Strathgairn.

```
to tree (size)
```

```
if
to
to
size: i = random 3
to
to
tree (size)
```

```
to (tree) (size)
if (size < 2) (size)
to (size)
tree (size + 0.75)
to (size)
tree (size + 0.75)
to (size)
end
```

```
to (tree) (size)
if (size < 2) (size)
to (size)
tree (size + 0.75)
to (size)
tree (size + 0.75)
to (size)
end
```

## Screen dump

I HAVE recently got an Amstrad CPC464 and a thermal printer.

I've read about the screen dump commands, which copy on to paper whatever is open the screen. In the May edition of Computing with the Amstrad, my only problem is that I've a more or less randomly searched through the manual to find such a command.

The screen dump commands in the magazine are only for the PCW models. Could you publish a screen dump command, as this would

save me many a sleepless night? - B. Leslie, Wolverhampton, West Midlands.

■ You'll find a simple screen dump for Epson compatible printers in the March 1985 issue of Computing with the Amstrad.

There is also multi-core, full size screen dump in this issue.

## Cycle on show

A GOOD way to see the effect of the repeating cycle of the pseudo random generator can be illustrated as follows:

```
MODE SINGLE TIME:PLIST
MODE:48,320:480:480
```

To fill the whole screen in Mode 3 of the \$40 = 300 - or 128000 - pixels have to be plotted. But because the random generator delivers much less numbers than this total the plotting will come progressively in an and I think 30 sec.

All of a sudden the sparkling emerges as if a blank page occurred. In fact the computer is displaying every pixel already plotted before.

The sequence repeats itself faster in the loop the instruction RANDOMIZE TIME and the plotting will go on until finally it covers the whole screen.

```
MODE SINGLE TIME:RANDOMIZE
TIME:PLIST
MODE:48,320:480:480
```

Now the plotting will continue and the screen will get filled. I had not enough patience for doing this event. - Patrick De Groot, Oppers, Belgium.

## Quint cursor

WHILE using my Amstrad CPC464 - as peripherals attached - I noticed strange things happening in my cursor when a certain combination of keys are pressed:

Clear the screen.  
Press Shift and cursor up key.  
Press Shift and cursor up key.  
Press cursor up key.  
Press cursor up key.  
Press cursor down key.

Press cursor down key  
Press Shift and cursor down key  
Press cursor down key  
Press Shift and cursor down key.

This sequence of operations causes two parameters' cursor blabs - and if you clear the screen or change mode - and the two normal cursor blabs which can be moved about the screen. Could you tell me what is happening? - **Kevin Young, Southton, Surrey.**

■ We're not sure what is wrong with your Amstrad, it certainly isn't normal behaviour. Has anyone else come across this problem?

## Colour fills

Having read Roland Westwood's fine-interesting article on machine code graphics, I typed in the programs, and after the usual hassle with typing errors I had the satisfaction of seeing them work.

We've had a couple of suggestions from so widely disparate.

In the article designer - October 1985 - I found it quite tedious to fill an area with a single colour. I therefore altered line 880 and added a few lines as shown below.

The P key is used as a toggle to set or reset the fill facility. When it is set all the areas are filled.

With the fill set I only need to hold down a cursor key to fill a new or return with the current colour.

```

880 IF (char#CHR(88)) OR
  (P)=1 THEN GOTO 920
  GOTO 880
920 IF (char#P)=88 THEN
  P=(NOT P)
  GOTO 880
  GOTO 910
910 LOCATE 1,24:PRINT "P="
  P;
920 PRINT " ";CHR(34);P
  (CHR(24));
930 PRINT " ";CHR(34);P
  (CHR(24));
  
```

After typing and assembling the pre-processor game I really barked at the prospect of

typing all that data into the Basic window.

I therefore wrote the usual utility before that does the job perfectly. The data is written in Basic program format to the disc, where I have called it *fill*.

It'll run then be loaded, assembled as necessary and merged with the rest of the Basic program. - **Roy Peterson, Rowland's Castle, Hants.**

```

10 REM fill
20 REM assembled to basic 4
30 REM by Roy Peterson
40 INPUT "first address 'out' "
  A
50 INPUT "last address 'end' "
  B
60 GOTO 70:"fill"
70 OPENOUT "fill"
80 GOTO 90
90 FOR out TO end
100 out=out+1
110 PRINT out;"DATA "
120 FOR i=1 TO 11
130 a=POK(i)
140 IF (out THEN PRINT out,
  " ");
150 PRINT out;HEX(i);
160 a=a*255
170 out=out+1
180 NEXT
190 PRINT out;" "
200 GOTO 90
210 END
  
```

## More on Raw

I AMVE unsuccessfully been trying to use Roland's Raw assembler utility. I realise this

All programs printed in this magazine are exact reproductions of listings taken from running programs which have been thoroughly tested.

However, on the rare occasions when mistakes occur corrections are published as a matter of urgency. Should you encounter error messages when you type in a pro-

gram, I am not using it correctly, but exactly how it is used?

I have tried loading it into memory, trying in the examples shown in the article and then running it.

This produces pass 1 and pass 2 with most but not all the typed information shown in assembler format.

However it does stop with the *DATA* message typing 40700 as instructed in the article results in fresh line numbers complete with the word *DATA* plus the original data line entered as, for example:

```
70 DATA DATA :loop
```

and no amount of typing can end the program, let alone work it.

I want to use Roland's program shown from the March 1985 issue of Computing with the Amstrad and have tried typing in the disassembly of the machine code as recommended in the May 1985 Postbag, but have failed abjectly.

Finally can Raw be used to assemble a program already written in Basic? - **Frank Northway, Rayleigh, Essex.**

■ Using Raw is actually quite easy once you get the hang of it. Here is a step by step guide.

First reserve some memory for the machine code with

```
MEMORY 1000
```

and load Raw. Now enter:

```
10 DATA 10 1000
```

This tells the assembler where to store the code. Next enter the program in data statements like:

```
20 DATA 10 4,7
30 DATA CALL, LOOP
40 DATA RET
```

programs, they will almost certainly be the result of your own typing mistakes.

Unfortunately we can no longer answer personal programming queries concerning these mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in the next page.

and type:

```
END
```

The machine code can be run with:

```
CALL 10000
```

You should hear a beep if all goes well.

In answer to your last question Raw can't assemble Basic programs.

## Bug defeated

I SEEM to remember reading somewhere that there is a bug in the CPC464 disc drive which prevents the use of the merge command, and I must say that each time I try to use it I get an *IOF MET* error.

Is there any way Amstrad can be persuaded to carry out a merge, and thus make possible a submerge library? - **M. N. Stand, Caversham, Reading.**

■ It's quite easy to get round the Merge bug. Simply save any programs or routines you want to merge in Ascl form using:

```
SAVE "FILE".A
```

This saves the program in memory in Ascl form with the same PROG.

## Vardump

I AMVE found Vardump from the February 1985 issue very useful, but now that I have added a *DISK* to my 464 I find that it will not run.

I have tried altering the memory location in line 80 to no effect. Can you recommend any alteration that will enable it to run on disc drive? - **C.A. Watts, East Ham, London.**

■ Vardump was written for a CPC464 with disc drive, so the disc unit isn't the problem. There must be some other reason why it is stopped working.

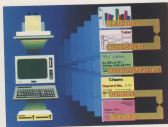
Have you added several ROMs? These can grab a fair chunk of memory. Also *SYMBOL AFTER 0* will prevent it from working.

The solution is to use an assembler and assemble the code lower down in the memory, say at 80000.

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RECOVER Recover "stuffed" files

FORMAT/VERIFY Very quickly format & verify

BACKUP Complete disc backup

ACCESS Lock/Unlock your files

WPE Selectively delete files

DISC MAP Display disc usage info

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DSPD Full details of all files

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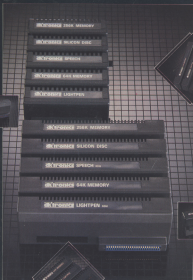
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# Desk top publishing boom forecast

AMSTRAD is set to double sales of its computers come the 1990s by riding the next boom predicted for the industry - desk top publishing. The forecast comes from Nick Pearson, managing director of Advanced Memory Systems, the company that has just released its best selling Pagemaker package for the CPC range.

"Desk top publishing is the next stage in the computer revolution after word processing", he told *Computing with the Amstrad*. "A major report emanating from the United States has stated that it will double the sales of personal computers in the next decade. And with Amstrad being a market leader already, there is little doubt that this is the least the company will achieve".

The AMX Pagemaker for the Amstrad combines a typesetter, graphics and word processor on two discs for £49.95. It lends itself to letters, posters, price lists, news sheets, in fact anything with graphics and text that needs to be created on A4 size paper.

"We have already seen enormous interest in this product", said Pearson, "but fascinating and useful as it is this is only the start. Desk top publishing is about to transform the computer business itself as more and more advances take place".

Pearson predicts that DTP publishing will have a dramatic impact because it will make a significant contribution to cost cutting for businesses around the world. "If you can imagine not having to pay huge printing bills, then you will appreciate what I mean", he said.

"Just think of the money involved in all those glossy annual reports that are produced for companies. Well within a relatively short time, desk top publishing will have become so



Nick Pearson (left) MD of Advanced Memory Systems, discusses the European market with the Amstrad publisher of the Amstrad Show.

advanced that the creative office manager or secretary will be able to produce them - on their own".

Nor will the impact stop there. "It would be possible for every street to have its own newspaper because of desk top publishing packages. Even Eddie Shah with his love of new technology couldn't possibly conceive all the exciting breakthroughs that are just around the corner".

The PCWB256 version of AMX Pagemaker will be out in the autumn.

in general computer hardware sales, with a boom in demand for software. As a result, only 50 branches will stock both hardware and software. Major localities will be carried out in-store to provide modern displays with greater impact.

In these shops software will take the lion's share of display space - seven metres - with hardware taking up the remaining four metres. The other 200 computer branches will now only sell software, with displays taking up between two and three metres.

Rowland stressed that the new moves do not mean that the original computer shops are to be closed or made smaller.

## Gestation..

*The long awaited Amstrad software package for the CPC6128 will now be available in a matter of weeks, according to an Amstrad official. Cliff Lawson revealed this during a question and answer session at the Amstrad Computer Show.*

*But what was the reason for the delay?*

*"Someone had a baby", he disclosed.*

## Sales switch

SALES of the Amstrad PCWB256 have brought about major changes in many computer departments at WH Smith stores.

John Rowland, merchandise controller, says in the company's group newspaper: "The sales of machines like the Amstrad PCWB256 means that the demand for software is growing. The major market is in software and it is here we can do an excellent job". He predicts a decline

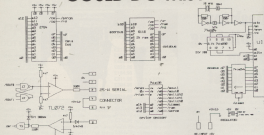
## Bolt-on disc drive

A BREAKTHROUGH for the PCWB256 which will boost its sales worldwide has arrived in the form of a bolt-on 5 1/4 in disc drive from Timatic Systems. Priced at £209, it is being offered as the first viable alternative for large volume users of Amstrad's 3in discs for the PCW.

Launched by Timatic Systems at the Amstrad Computer Show, it has already attracted considerable attention from overseas. A company official said Sean Rowlock - the giant stores group handling sales of the PCW in the States - and several European distributors are currently evaluating the new addition.

News of the disc drive was greeted with considerable interest by market

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### From Page 3

analysts. "This could be very good news indeed for Amstrad", a spokesman for leading stockbrokers told *Computing with the Amstrad*. "For to date the only real area of concern about the PCW8256 has been its reliance on 5 1/4 discs.

"It is no secret that many people believed that this would limit its impact on the vital United States market. Now that this new drive has appeared on the scene all that should change. It will be most interesting to see what happens now".

Meanwhile CPC8128 owners will also be able to buy their machine's own version of Timatic's 5 1/4-in drive. At £240 it is more expensive than the PCW8256 model because of the added complexity of the interface involved.

Both-as 5 1/4-in disc drives are reported to be in the pipeline for the other Amstrad computers, with every likelihood they will appear before Christmas.

"We feel that our add-on will provide yet another first class reason to invest in an Amstrad micro", said a Timatic spokesman.

## AMS telex arrives

AN interface which effectively transforms Amstrad computers into telex terminals has been launched by networking specialists Northern Computers. Unveiled at the Amstrad Computer Show, it offers a host of features which can only be found on machines costing more than double its price tag of £1,195.

Non-do users need any experience of telex machines to operate it. Using their micro as a word processor, the message can then be transmitted automatically over a dedicated telex line.

Designed to be linked with Northern Computers' Amstrad network, it is aimed at the top end of the commercial market—companies that send or receive more than 10 telex communications a day.

However Gareth Litter of Northern Computers was at pains to point out that Amstex is not a replacement for



Gareth Litter of Northern Computers

a reader or electronic mail. "The price alone takes it out of that market", he says.

"But it is a real alternative to a telex machine particularly for companies with an Amstrad network, for it means that anyone on the system can use his Amstrad to send or receive telex messages".

## Upgrade kit

AN upgrade kit to convert a PCW8256 to the full specification of the 8012 model has appeared on the market for £789.95. It is produced by Citadel Products who say that it can be fitted in under 30 minutes by "any one capable of replacing a fuse.

The kit adds a second 5 1/4-in disc drive of 1M6 capacity and copies the RAM disc to 32K.

"We have had a fantastic amount of interest in this product since we introduced it for the first time at the Amstrad Computer Show", says Vic Carter of Citadel.

## Called to the bar

A LEADING business software house is aiming to increase its grip on the local trade with a bar stock control package for the PCW machines.

Quest International has launched the new product in the wake of its

success with Cash Trader, the accounts program which has already sold in excess of 1,000 units, the majority going to licensed premises.

The latest offering—released at the Amstrad Computer Show—enables the user to set up stock descriptions, case sizes, yields, cost and selling prices.

Bar Stock Control allows for rapid entry of purchases and closing stock, providing printouts for each item sold at selling price, cost price, profit percentage and the value of stock in hand.

It also records returns, allowances for credit, spillages and overheads so that gross and net profit can be determined. Price: £399.95.

Also new from Quest is Job Coster, designed for self-employed tradesmen and small contractors to keep accurate records of day-to-day transactions. This too carries a £39.95 price tag.

## Lifespan of PCW 8256

AMSTRAD is likely to carry on manufacturing the PCW8256 for at least two years. That was disclosed by Roland Perry, the company's technical boss, when questioned by a user at the Amstrad Computer Show.

"I think you have got to look at the investment put into the machine, not just in design but in marketing", he said. "I would be surprised if any distinct product like the PCW8256 had a life of less than two to three years".

Asked which of the two PCW models were the most popular, Perry revealed they were selling in almost identical quantities. The Amstrad toffs, while commenting on Amstrad's new spelling checker for the PCW word processor, leaked the news that the company has one of its own in the pipeline.

"There is a general intention of having an official spelling checker which you may see later on this summer", he told the audience in the Amstrad Theatre.

A question about the availability of all Amstrad's computers elicited this answer: "In general all our machines are in full production".

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**WHEN** I've finished writing my column, I always read it through one more time to check that its contents are entirely factual, and as much bias or prejudice as possible has been removed.

Consequently, what may appear as personal comments rather than indicators of good practice or industry standards is frequently altered, even at this late stage.

I'm telling you this since this month's comments regarding the Data Protection Act could not be qualified in this way. If they seem strong to some of the readers it is because our high-ups have well and truly dropped us in it. Contrary to appearances, what follows is still factual.

Let me ask two simple questions:

- What has the Amstrad 464 in common with a multi-million pound bank installation?
- Why can the information on a 664 require more security than the telephone at GCHQ in Cheltenham?

Before assuming you know the answers, I suggest you read on. I also assure you that the following is not a spoof, since no matter how ludicrous parts of it may appear, the situation described is absolutely genuine. Furthermore the actions described are now demanded in law.

The majority of us must have been irritated by the unsolicited mail which clutters our doormats. Most of this increase in tree-felling is due to unscrupulous firms making enough money to run their expensive silicon toys by selling mailing lists to all and sundry. If you sign for a subscription, apply for a credit card, join many a society or even request a brochure you currently stand a better than even chance of having your name and address widely distributed.

All that is needed is for a tape to be produced on one computer, and once sufficient money has changed hands it is then used on a second belonging to a totally separate organisation.

If you suspect that your details may be leased to some third party, try the following little dodge. Make a slight change to your name or address, such as converting Rogers to Rodgers or 131 Leebank Road to 131A Leebank Road. Should you see this repeated on a series of envelopes,

# Your Amstrad and the Data Protection Act

from a variety of sources, it does not need a Nobel laureate to deduce that someone has issued your name to the subsequent senders. Providing you remember who received the original version, you know where to write your stiff letter.

A second, if less frequent irritation, is discovering that somewhere, deep within a computer's electronic heart, erroneous or misleading information has been stored. There is nothing malicious about this, but people do occasionally make unintentional typing errors.

The computing professionals

**By JO STORK**

naturally became concerned when these and similar worries became a political football. They welcomed a set of controls, and had no objection whatsoever to them being backed by the full might of the law.

Unfortunately once the lobbyists had had their say, the disorganised data processing industry was left high and dry. They now have to cope with a law about which the kindest thing that can be said is it has made everyone aware that in 1985 individuals have less rights than governments.

Armchair users may need to register under this law, the Data Protection Act (DPA) which came into force on May 11 last. However before I stand accused of making a party political statement, I stress that most of these lobbyists were civil servants, Ministers or Opposition Front Benchers insisting that the national office would crumble if the computers within their departmental compass were to come under the

provision of such an Act. Consequently, once they had:

- wove their spells on the EEC directives;
- managed the most complicated series of compromises since Salt 1 in order to bamboozle freedom of information activists into thinking they had scored a few tactical points;
- snatched the whole shooting match in legislation;
- ensured the exemption of state-run computers on the grounds that there must be an unrestricted interchange of data between the state's organs, and so on, there was precious little left that the computer professionals could recognise as their original proposals.

If you think I am being unduly harsh on a Bill which leaves government computers exempt from this Act while making our tiddly systems liable, then I assure you I have been extremely restrained. I have immense sympathy with the intention of the DPA, but only wish that the one we are stuck with was not such a lemon.

However, enough of the background, let us have a look at how this hog of a Bill actually affects us.

In essence the DPA states that if any personal records are kept on a non-exempt computer that computer must be registered and its operators carry out the requirements laid down. The main problem is that the wording of these requirements, particularly the word 'personal', was quite knowingly made incredibly vague.

Whereas it was originally anticipated as being material of a potentially sensitive nature, such as

## From Page 7

medical, criminal or personal finance records, it rapidly became obvious to the law-makers that there was a very real danger of these being so many exceptions, little data would actually remain protected.

Were this to happen the full wrath of Brussels would be felt in Whitehall, and so to protect themselves our national leaders decreed that even an organisation such as a publisher's team using an Amstrad to keep track of membership payments and its own running costs must register under the DPA.

This could easily result in more than a million computers in this country needing registration. Only if your Amstrad is solely used for games can you be certain it does not need registration. The essence of the Act is such that a teacher working from home and using his micro to keep track of pupils' marks must technically register.

Naturally enough, most individuals – and many organisations with infinitely more critical data held on their files – are working on the assumption that with so few inspectors they can ignore the DPA on the grounds that they are never likely to be chased. I am not prepared to recommend you to do likewise.

Since this is a patently ludicrous situation I now dream of being granted three wishes, and using one of them like this: "After asking a suitable number of queries of the departments concerned as to whether registration is required, every single micro in Britain would register, thus bringing several of HMG's exempt computers to a grinding halt with an acute case of data congestion".

Fortunately this law will have little effect on most organisations' working practices, but even though you should now have little trouble in answering my two original questions, I wish to take a little more of your time in order to outline what rights individuals have under this law and what further rights you should offer individuals if you have registered.

The letter will also ensure that Amstrad-based organisations can operate within the spirit of the DPA's

intent as originally envisaged by my profession.

The essential points to follow are:

- A responsible member of the organisation must be the registered Data Protection Officer.
- Anyone who believes there is information about them held on the Amstrad can ask for printed copies of data referring to themselves or their next of kin.
- Anyone can demand that false information about them be changed.
- Data on the Amstrad must only be accessed by a very few nominated persons.
- No data held on the Amstrad can be passed to other organisations unless the second organisation is one to which the first is affiliated, or to the organisation's auditors. Also the individuals' identities must be re-

moved and they must be notified about the data transfer.

- Data transfer may be voided in many cases.
- Data held on the Amstrad must be treated as highly confidential and recipients of information must sign for its receipt.

This dry list of points should keep you within the law as well as keeping the most obstreperous individuals off your back. In fact most organisations will continue as if nothing had happened, despite HMG having a new power to play with.

I leave you with this thought. The organisation adhering to the above will in fact be granting more rights than are absolutely required by the DPA. It should enable some flexibility should a Freedom of Information Act ever come into effect.

# Mini Office II database in action

**LAST month, after a brief introduction comparing Mini Office II with other all-in-ones systems, I described the creation of the Database structure and the entry of the records themselves.**

Now we'll look at the facilities provided for manipulating the records once they are on file by looking at a cricket club's casebook.

The first of these requirements is

to be able to list these records, either in whole or in part. The record we created is represented in Figure 1.

In order to have a sensible number of records to work with I have created 10 records on a file called CRICKET. These are listed below. Since we are assuming the treasurer will only need to sort or select the records by the fields marked with a \*, I requested a listing which showed only these fields

Sort	Select	Field	Length
*		Date	3 characters
	*	Transaction type	8 characters
	*	Name	18 characters
	*	Purpose	20 characters
		Quantity	3 characters
		Unit price	3 characters
		Amount received	0 characters +
		Quantity	3 characters
		Unit price	3 characters
		Amount paid	0 characters +
*	*	Reference	4 characters
		Notes	20 characters
		Total	94 characters

Figure 1. Record structure



fields plus the date.

A point to remember when printing is that in calculating whether the record, or the portion of it that is required, will be folded on to two or more lines, you should allocate a couple of spaces between each field. If in doubt as to what the eventual listing will look like, you should select Hardware Options from the main database menu followed by toggling Output to the Screen.

Once satisfied with the design, you should toggle back to your printer type.

Assuming you enter these or similar records on to the file the following examples of sorting and selecting will match the explanations below. However first I will discuss the marking of records. The aim of this feature is to split the file that is held in memory into two, where Group 1 is those records which are marked - in other words identified by a \* in the top right of the screen when they are presented by the Edit Record option - and Group 2 is the unmarked records.

Selecting records for marking can be done either directly from the Edit Record option by pressing M or with the Search Data option.

Records which have been marked may be separately saved on to a new file by using the Save Marked Records option or separately printed with Print Marked Records. The former permits the construction of a series of subfiles, each with identical structures but representing different situations. An example of this would be to search for all records which had:

**Field 2 Transaction Type = MEMFEE**

and save the records which "passed" this on to a separate file called MEMBERS.

After selecting Clearing All Members, in other words restoring the CRICKET to its state before the

11/05/84	MEMFEE	E. DURRICE	CRICKET 8478	1102
12/05/84	Donation Received			
05/05/84	Salary	MATTHEW S. J.	GROUND MAINT.	5000
	2,700/Year			
05/05/84	Salary	MATTHEW S. J.	GROUND MAINT.	5000
	2,700/Year			
04/05/84	MEMFEE	GREGORY S.P.	PLAYING MEMBER	0400
	Wife + 2 Children			
04/05/84	MEMFEE	LEWIS S.B.	PLAYING MEMBER	0400
	Wife + 2 Children			
04/05/84	MEMFEE	BARROW S.H.	PLAYING MEMBER	0400
	5 Purchases + Late Payment			
03/04/84	MEMFEE	PETERS G. S.H.	PLAYING MEMBER	0400
03/01/84	MEMFEE	LAWRENCE S.C.	RETIRED MEMBER	0400
03/05/84	TEAS	140 01 / 3rd 01	vs ABLESTROP	0400
	2 Teams + 1 Score+			
14/05/84	TEAS	140 01	vs THROLEBURY	0400

Figure 8: Records in the CRICKET

marking of records of Transaction Type = MEMFEE, a search could be made for all records which had:

**Field 2 Transaction Type = TEAS**

This raw set of marked records could then be saved on to get a third file called TEAS. Figure 91 shows the result.

Searching or selection is not limited to just a single field, since any number of criteria may be chosen, for example:

**Field 2 Transaction Type = MEMFEE**  
and

**Field 3 Reference = CASH**

would select those records which represent the money received for membership fees in cash rather than by cheque.

The final point to note when using the search facilities is that Mini Office is case specific. This means that if you had input some records using MEMFEE, others using Memfee and some using memfee, then a request to search on Field 2 using MEMFEE

would only mark the first group. You would not have selected all the membership fee records.

This is a clear proof of the requirement to make a note of the valid entries which may be made in any search field, as mentioned last month.

Two basic types of calculation may be carried out. The easiest to understand is the production of totals. Using the marked records we selected representing the 'Tea Money', this would be carried out by selecting Calculate from the main database menu to enter the calculator, followed by Total Marked Records.

Once the correct field to total has been selected, in this case Unit Price, this would produce the total amount of money the club received for the tea it provided.

The other enables the database to be used in a "What If?" type of operation. If the tea records were selected or marked, one could calculate what the revenue would have been had the price been 50p higher. This would be done by adding:

Date	Transaction Type	Unit Price	Amount Received	Rate	Name	Notes	Purpose	Quantity
03/05/84	TEAS	08.00			1st 01 / 3rd 01	vs ABLESTROP		20
			08.00		CASH 2 Teams + 1 Score+			
14/05/84	TEAS	08.00			1st 01	vs THROLEBURY		12
			08.00		CASH			

Figure 9: Results of searching for TEAS

**From Page 3****Field 3 - Amount Received by 15**

and then requesting the total as before.

Such calculations are performed by selecting Calculation from the database main menu, followed by Alter Marked Records, Selecting Field 9, Selecting '+', .15 followed by Totalling as already described.

The last pair of commands regarding marked records can be particularly useful. The first, Toggle All Markers, is used to remove the markers from the currently marked records while simultaneously placing markers on all those records which previously had none - the selected state of all the records is reversed.

This is particularly useful when you wish to exclude some records on the file from future treatment. Assuming

we wish to total all payments received with the exception of those made for tea, this would be carried out as follows.

Once again we would search through the file for:

**Field 2 Transaction Type = TEAS**

If we then Toggle Markers, every record except for those which the search found would be marked. We could then do our calculation or saving as required.

The second command prints the records we have marked. This is done by selecting Print Marked Records from the main database menu. The tea records shown were printed off in this way.

As explained last month, with our record size of 94 characters we are restricted to 199 records as our CRICKET file. The same is true of

TEAS, MEMBERS or any other we may wish to create. With a creative use of the Save Marked Records option one can easily overcome this limitation.

The main file will always start off as CRICKET, but this can then be split so that a separate file represents all the postings made in a single month. The 199 postings limit should not be a problem even at the height of the season. These files could be named CRICKET01 through to CRICKET12 for January through to December respectively.

As for subfiles such as MEMBERS, providing the separate classifications stored do not represent a significant percentage of the total number of records held, once again 199 records should be sufficient.

Next month we will look at the Database again, but with the specific application of producing mailing lists.

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# THE ELECTRIC STUDIO

**PLANNERCALC**, which is a spreadsheet written originally for micros such as the Radio Shack Model II and the Superbrain, dates from early 1982. Although it never became one of the giants of business software it held its own, being adequate for many applications, and was an obvious candidate for a PCW resurrection.

Like all spreadsheets PlannerCalc works with a grid of cells (boxes), each identified by a column and row number, and with the screen acting as a window on to the worksheet. When values have been entered into the cells calculations can be carried out to give totals, averages, maxima, minima and so on.

In addition to the usual arithmetic and logical operators, and basic functions such as AVERAGE, SUM OF, MAX and MIN, PlannerCalc has NPV (Net Present Value), CUMulative total, and the more unusual GREATER OF, LESSER OF, and GROW BY (automatic implementation).

Conditional statements — IF ... THEN ... ELSE — are also available. It is not well endowed for scientific and statistical calculations, having only LN (Natural log) and EXPonent, but its main market is the small businessman, not the mathematical modeller.

Setting up a worksheet means

# PlannerCalc

**GABRIEL JACOBS** looks at a spreadsheet that, while long in the tooth, can be considered a good starter pack for the small businessman. And at an attractive price, too.

creating a template of commands entered by row — in PlannerCalc called lines — or columns. A typical series of line commands might look something like:

```
LINE 1 SALES = 90,000,70,000,20,00
I,PR7
LINE 2 DISCOUNT = IF LINE 1 >= 500
THEN LINE 1 .10
LINE 3 NETPROF = SALES - DISCOUNT
```

Lines 2 and 3 tell the program to calculate a discount of 10 per cent on each item of data in Line 1 — each item being a value in a column — if it is greater than or equal to £500, or else to ignore the item at the original figure. A printout will then show each sale, the discount it has attracted and the amount to be invoiced.

The same mode of calculation can

be carried out on columns rather than rows and can become very complex with multiple conditions, discontinuous logic, incremented gawdits and the like.

All this may seem daunting to an inexperienced user, and it has to be said that to give of its best PlannerCalc does expect some understanding of programming procedures.

However that is true of most spreadsheets which offer facilities over and above the most basic ones, and in any case the commands soon become familiar territory.

This is especially true of PlannerCalc because for the most part it uses an English-like syntax. Commands such as COPY COLUMN 8 TO COLUMN 15, SUM OF LINE 1 THRU LINE 3 or DECIMALS ARE 3 can be understood even by complete beginners.

Columns and rows can be identified in commands by names you give them (called Labels) rather than numbers, and this also helps to make formulae comprehensible. The system does have its disadvantages however. For instance, care has to be taken to change all appropriate formulae if a column or row is relabelled — the formula PROFIT = INCOME - EXPENSES will not be calculated if you have relabelled EXPENSES to read COSTS.

Designing a hard copy printout of all or part of an electronic worksheet is never an easy task, and PlannerCalc can offer just as much of a challenge in this area as other spreadsheets, particularly if you want the hard copy to differ significantly from the screen display.

However the program handles simple formats as easily as many of

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# Not hostile, but do treat with respect...

**GABRIEL JACOBS**  
 reviews the Sage Database

**DATA management systems generally involve a trade-off — the greater the range of facilities, the more rigid and unfriendly the rules for structuring the data.**

From this point of view the Sage Database is a middle of the road package, not as hostile as full-blown relational databases, but more powerful and therefore less forgiving than simple electronic card index systems.

With the Sage package the most demanding operation is that of setting up a new file, since this involves a degree of planning at odds with the way most people's minds work.

The user has to declare in advance the number of fields per record, their lengths and types, output width, left or right justification, decimal precision, conversion to upper case and so on. Apart from the purely cosmetic operation of altering screen display coordinates, changing a field parameter in an existing file involves restructuring the entire database.

On the other hand, with a measure of forethought and almost certainly some frustrating trial and error it is possible to set up precisely tailored data-entry and report-generation procedures.

Files and individual fields can be permanently or temporarily protected with a release of locks, passwords

and unforced keystrokes, and there is total flexibility in field selection for report purposes. There is also a wide range of field types, including compacted and uncompactd numeric and date fields, time fields and fields on which various kinds of calculation can be carried out, with column totals and basic statistical analyses thrown in for good measure.

Data entry in selected fields can be restricted to numeric or textual ranges, such as allowing only numbers between 1 and 60, or only YES or NO. Forced entry can be specified, obliging the operator to enter information before moving to the next field.

The built-in text editor and mailshot utility are surprisingly powerful. In fact the set of page

layout commands doesn't fall far short of that of many dedicated packages, and the range of options includes such things as run time keyboard input and viewing a merged letter on screen before printing. Labels can be printed using the special utility provided, though unfortunately it limits you to a three-across format.

Of course the provision of a wide range of merge-print features inevitably adds to the complexity of using the program. So again, despite Sage's praiseworthy attempt to sugar the pill, inexperienced users will probably have to learn through bitter experience.

However for those who find creating a new file or producing personalised letters a daunting prospect, interrogating a database and manipulating the information it contains is about as gentle an exercise as it could be.

In what Sage calls the Enquiry Processor, the normal computer-style database query language has been replaced by a welcome English-like syntax. This has been achieved by a judicious choice of system words and by adding a sprinkling of disposables — these are words which may be included for the sake of intelligibility but which the program will ignore. The following command, for example, would be syntactically valid:

*Please list all employees with a surname of Jones and a salary*



File definition screen

## From Page 19

greater than 9,000 showing me the age and the department. Thank you.

Using field numbers instead of names, symbols instead of words and discarding diacritics, this could be reduced to:

1=employees with 1="Jones" and 2=9000 show 2 2

The Enquiry Processor is also used for sorting records, either relatively slowly if in-string searches or searches with relational operators have to be carried out, or rapidly if a key field consisting of only a compacted record number has been included in the initial file definition.

Such indexed fields are a common feature of databases, and even some of the simpler ones allow a number of fields to be indexed. Surprisingly the Sage Database allows only one—the key field—which could prove something of a nuisance if your records are mostly textual, such as in a bibliography, or if you constantly require numeric sorts. Furthermore search criteria are restricted to two fields at a time and the program will only sort into ascending order.

Again however these limitations have to be set against the plain English implementations of the search and sort commands. In many circumstances speed and range may be secondary considerations when it comes to being able to give a clear instruction such as:

Sort printers by category with price greater than 20 or weight less than 8 showing total number of job

Much of Sage's reputation for quality Amstrad applications software has been built on the fact that their products have been well implemented on the PCW and designed as far as possible to run on the entry-level system. I was therefore surprised to find that the database has not been configured with the care we have come to expect.

For instance, the Delete key does not work properly in the Enquiry Processor—Alt + H has to be used instead—and the program is not completely bomb-proof. On one



Typical data entry screen

occasion, I managed to crash back to CP/M, leaving permanently corrupted some data by trying to write to a disc previously used for PCW LoadScript

files. Worse, on a single-drive PCW or CPC6128, the user must make alarmingly frequent changes between system and data discs. Sage admin-

## SAGE DATABASE CHECKLIST

### Basic Features

No. of files/open	1
File size limit	
Max. records per file	Disc capacity
Max. record length	Unknown
Max. fields per record	1,024 characters
Field types	255
	Text, Integer, Single-precision, Extended-precision, Date, Key, Date-stamp, Time-stamp, Blank, Reading
Max. fieldwidth	255 characters
Record addition/deletion	Yes. Can be locked
Record update/edit	Yes. Cannot be disabled
Record duplication	No
Calculations	Yes
File security	Comprehensive

### Searching and sorting

No. of search/sort fields	2
No. of criteria	20
Logical operators AND/OR/NOT/AND/OR modifiers	All 4
Wild Cards	All 4
In-string search	Yes
Ascending sort	Yes, with = and < 2
Descending sort	Yes
Case-independence	No

### Hardware

Select fields	Yes
Change field order	No
Re-position fields	No
Merge-print	Full facilities
Text editor	Yes
Labels	Three-screen-only

fully recommends that the program should be run on a twin drive machine, but surely better use could have been made of, for example, the PCW's RAM disc.

The documentation is of a high standard, with an excellent tutorial to get you started.

However errors in the instructions for making a working program disc are hardly likely to inspire first-time users with confidence and some of the descriptions of the more advanced functions, contained only in appendices, are equally likely to baffle them.

Yet despite these criticisms – most of which are ultimately relatively minor – the Sage Database is worthy of serious consideration if you have a twin drive machine, and have not yet invested in a data storage and retrieval system. At about £70 it is not an outstanding bargain, but it

does offer significantly more than many of its rivals in the same price bracket.

Lastly, the program comes with

the Sage hotline help facility and its general goodwill – virtues not always to be relied upon with some of the rest-of-the-world competition. ■



Field definition screen

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Continuing with our excerpts from John Hughes' highly successful book *Mastering the Amstrad PCW 8256-8512* we take a look at choosing and using applications programs.

IN the days of computing's stone age back in the 1960's using a computer meant, almost inevitably, writing your own programs for it.

If you couldn't do that you either had to pay someone rather a lot of money to write a special program just for you, or you learned to program for yourself. And if you had neither the money to pay nor the patience to learn you forgot about the computer and made do with pen and paper instead.

Custom-designed programs are still being created, though as programmers now are paid rather more than they were 30 years ago – even allowing for inflation – buying one will set you back quite a lot of money.

All the same, for certain highly specialised purposes like landing a rocket on the moon or handling an airline's world-wide ticket reservation system, research institutes and big companies have no choice but to pay the price.

For most normal commercial and domestic tasks however there are now available an enormous number of ready-made programs for different types of computer. These which are designed to do something for the user – rather than help him write programs or organise his disc-files – are called applications programs and it is with these that I am now concerned.

However before looking at individual programs it is worth while taking a general look at such programs in order to see what features are most useful and what should be avoided.

First, it has been estimated that there are over 8,000 commercial programs available for CP/M computers. It is fair to point out that most of them – like the majority of books, paintings and whatever else you care to name – are not very good.

Often this is either because they were written a long time ago and have not been properly updated, so that they fail to make full use of the power of modern computers, or because they were designed for a totally different market from the one in which they are now being offered.

For example, accounting programs from the USA may ask you questions

# Pick the best applications programs

about State taxes and Federal taxes which have no relevance in the UK. Even if they avoid this sort of trap they may make it impossible to print money amounts with a pound sign (£) in front of them. Since most computer software comes from the United States this sort of problem is more common than you might expect.

Another area that needs care is that of user friendliness, or ease of use as it is called. The theory is straightforward enough: a user friendly program is one which you can use without needing to remember a string of different commands – perhaps it uses menus, like LogoScript – and which tries to stop you making destructive errors by double-checking that you really mean to do what you have said.

These goals are admirable in themselves, and programs which take no account of them are often awkward to use – the lack of friendliness of some of the older CP/M utilities is a frequent source of complaint.

At the same time some programs are so friendly that they positively get in the way of your work by presenting you with menus after menus, even after you have become quite familiar enough with the program to be able to get along without that help.

In these terms LogoScript offers the sort of compromise which you may find satisfactory – help is available for when you need it, but you can usually avoid it when you don't. Most good software follows the same principles.

Good applications programs almost always involve you in buying a special system for doing whatever task they set out to perform. Because they were designed for general use

and not for your own specific purpose you will need to adapt your present practice to fit the new system.

Many small businesses, particularly sole proprietorships, struggle along without any particular system for the various chores which arise up.

In such organisations doing the payroll may involve nothing more complicated than sitting down with the appropriate tax tables and record cards, and keeping accounts sometimes degenerates into a squallid system of putting receipts and cheque stubs into a drawer for the accountant to puzzle over sometime in the future.

More organised concerns will have provided themselves with one or the other of the various excellent manual payroll and accounts systems. It is with these that an accounts or payroll program should be compared. You must therefore be sure that the system which you buy is one that meets your own particular needs, or is easily adaptable to them.

The lesson here is flexibility. An accounts system which insists on a full set of books being kept may well be very rigorous and accurate, but it may be more than you need. Perfectly good accounts for typical small business purposes can be maintained with a simple spreadsheet program.

The other problem is the converse of this – it is common for users to start off with a program which is too limiting for their long-term needs, and to find out too late that converting to what they should have had all along would be a slow and expensive business.

The only advice which will always apply is to look very carefully at a

program before you buy it. If this is not possible you may have to rely on reviews in the various business and computing magazines.

At all events it is a sad fact that not all the people who sell programs will be of much help to you. This is partly because they will be largely unaware of your particular problems, and partly because most companies are geared up to the selling of hardware rather than software. The proverbial pinch of salt can be a great help in choosing applications programs.

Until quite recently applications programs assumed that when you wanted to do accounts you would load an accounts program into your computer, when you wanted to write a letter you would use a word processing program and so on.

Gradually this concept has begun to change, so that it is now possible to buy applications programs which will do more than one task.

Imagine writing a quotation for work which you are going to undertake, for example. The majority of the task would count as simple word processing, but in addition you might need to carry out some simple calculations — adding up the cost of several individual operations, perhaps.

Instead of having to stop word processing, load a program to carry out calculations, write down the answers on a piece of paper, reload the word processor and copy the figures off the paper and into the document, some programs now permit you either to carry out word processing in the middle of, for example, a spreadsheet, or to do simple arithmetic in the middle of a word processing job.

The ultimate in this sort of mixed operation is sometimes referred to as menu desk computing, because it allows you to handle several different sorts of operations simultaneously, just as you can have papers relating to several different jobs on your desk at the same time.

In general, software for this kind of operation tends to be expensive, is sometimes not very user friendly, and no doubt many users fail to make full use of its facilities.

However there is no denying that

an ability to do more than one thing in a particular applications program, or at least to import the results of a calculation directly into a word processor without writing things down on a scratch-pad, can be a great time-saver.

Most spreadsheet and database programs have the ability to output text as well as the normal results of their calculations, and this can be a most worthwhile facility.

When changing over from a



manual to a computerised system there will inevitably be occasions when things don't work as they should. There are some real horror stories about big companies which computerised their payroll accounting and only then found faults with their new system, which meant that no one could be paid on time.

The golden rule, particularly where money is concerned, is — never abandon a manual system in favour of a computerised one without a period of running both at the same time.

This may seem wasteful, but the advantages are two-fold: if something goes wrong with the new system — and because it is new and unfamiliar, no one will know what to do if that happens — the old system is still there to fall back on, and if you get different results from the two systems

you will know that there is something seriously wrong with either the one or the other.

There is a distressing human tendency to believe what the computer tells us, even if closer scrutiny would show it to be manifestly absurd — to chain your accounts payroll to a system which may be making errors without any way of double checking the result, is extremely dangerous.

Trying to explain to an employee that he has been underpaid this week because of a computer error — which is usually shorthand for operator error — is bad enough, but an error of just a few per cent on a budget forecast, caused perhaps by carelessness in entering formulas on a spreadsheet, could mean the difference between success and receivership. Be warned.

Incidentally it is all too possible when you are converting from a manual to a computerised system that you will be too easily satisfied with what you have and thus make no further progress. This has happened in so many businesses that the bizarre combination of high-tech equipment and old-fashioned methods has become a modern commonplace.

The classic arms equivalent is the true story of how men were detailed to hold the horses in artillery companies which had been mechanised for decades because nobody understood the consequences of the rule that changes in technology should mean changes in technique as well. Yuff said!

Buying a program is a little like buying a car — usually it works perfectly well at first, but sooner or later you may have problems with it.

The reasons for this are pretty much the same for both cars and programs, and have to do with the fact that both are highly complex products used in the main by non-specialists. Of course a program should never actually wear out in the same way as the parts of a car, but otherwise the analogy is a fair one.

Unexplained errors in the operation of a program are called bugs, and it is safe to assume that nearly every program has them, just as

## From Page 23

nearby every book has imprints in it. Generally speaking these bags are pretty harmless, and in most commercial programs they are unlikely to cause you any real inconvenience but you will assuredly meet them from time to time.

Several of the better producers of commercial software offer schemes for maintaining their programs, perhaps in conjunction with telephone advice – often rather dramatically called a hotline service.

In some cases these services are provided free for all registered purchasers of the program, thus helping to freeze out users of illegitimate copies. Sometimes there is a small annual charge to pay.

Either way, the provision of proper after-sales service, or software support, is something which you should investigate when choosing programs – particularly those, like payroll, which may cause embarrassment if there is a substantial delay in running them.

A final problem of computerised systems, and one which is becoming increasingly significant, is that of the security of the system.

It is sometimes assumed that the security implications of computers are not basically any different from those of normal manual practice. This is emphatically untrue.

From the standpoint of small business use, the biggest source of difficulty is the floppy disc. Unlike documents on paper, which take time to copy, the entire contents of a floppy disc, amounting perhaps to several hundred pages, can be copied in a matter of seconds and leave no trace of the copying having taken place.

Various attempts have been made to improve security, and you should at least have an eye towards these when considering the purchase of new software. The classical solution is passwords, combinations of letters and numbers without which it is impossible to gain access to confidential files.

Some sophisticated systems allow different levels of security, with different passwords for each level, so that a user may be able to see some records on a disc but not others – for

example, it may be possible for payroll personnel to amend pay records of staff, but not to gain access to personal information of a confidential nature.

Passwords generally provide excellent security if they are properly used. However, as their value depends upon their secrecy, they can be rendered useless by people writing them down to save forgetting them, or choosing easily-guessed words such as their own names or the names of their nearest and dearest in passwords.

Password generator programs are available which will suggest secure and easy-to-remember combinations to avoid these problems.

Even if all due care is taken with choosing and using passwords any user with a moderate level of experience of computing will probably be able to get at confidential information stored on a floppy disc.

Short of using various encryption techniques to scramble data – and these are available – the best advice in any organisation bigger than a one-man-band is to enforce strict security standards when handling floppy discs, to keep them locked away when not in use and to restrict the number of staff who are permitted to handle them.

Payroll and accounts programs are particularly vulnerable to ingenious and dishonest tampering, and the very nature of the computer makes it less likely that an offender will be detected. There is now a fairly substantial literature about computer fraud, one of the effects of which has inevitably been to popularise it. Don't assume that it won't happen to you.

Modern computing equipment is extremely reliable, and breakdowns are few and far between. However they do happen from time to time. The most vulnerable items are those which have a high proportion of mechanical parts, such as printers and disc drives.

Short of providing actual physical back-ups for these – and a second disc-drive is certainly a very useful thing to have – it is worth considering that programs which give you the option of redirecting printer output to the screen can be a blessing if something does go wrong with a printer.

Obviously a word processor with-

out a printer is practically useless – except in terms of preparing texts which can be printed out later – but many payroll and accounts programs can still be usefully run without a printer if the results are simply backed up on to a disc for printing later.

In this circumstance there is a CP/M Utility program which may prove useful. This is the PUT.COM program, which is used as follows. Enter the instruction:

### PUT PRINTER OUTPUT TO FILE Filename.<filetype>

and everything that would have gone to the printer will instead be directed to a disc file with the filename and type specified.

To revert to normal output, enter:

### PUT PRINTER OUTPUT TO PRINTER

The PUT command has a number of forms beyond the two given here – full details of the others are given in the user manual. However the two forms listed are those which are likely to be found most generally useful.

When the printer is again operative you can transfer the contents of the file which you produced with the PUT command on to the printer using our old friend PIP, thus:

### PIP LST<filename.<filetype>

LST is CP/M shorthand for the LISTing device, namely the printer.

To sum up, then: in choosing application programs please which should be borne in mind include being certain that the system will meet your own needs, that adequate support from the manufacturer is available in case you have problems and that the system is suitably secure for your own circumstances.

In starting with a new system it is essential not to abandon the previous manual system immediately, but to run both side by side for a while. In this way errors caused by lack of familiarity with the new system will be trapped, and difficulties caused by hardware or software failure will be eliminated.

Equipment failure can be guarded against to some extent by redirecting the output from the printer to disc files. ■



# Tandata's Tm 512, as smart as they come

WITH the Tandata Tm 512 you get a pretty smart modem for your money. At a single keystroke it will dial a number, auto-detect the local rate of the answering modem, send a log-on/ID string with appropriate delays, carriage returns and so on, and automatically re-dial if the number is engaged.

Its battery-backed ram will store up to eight telephone numbers and auto log-on instructions, together with all previously set comma parameters, so at power-up everything is as you left it.

It will also answer your phone, send a carrier signal and hook up to the modem originating the call, whether you happen to be around or not.

The Tm 512 is housed in a slimline black case. At the back are power and telephone cables, a TTL 8-way DIN socket, an RS232C D socket, and a standard PST (800 series) telephone socket for passing on the line to a handset. At the front are an On/Off button and five LEDs - Power, Line Seize, Carrier Detect, Transmit and Receive.

Band rates handled in both Dial and Answer modes are 300/300 full duplex, 1200/750 full duplex, and 1200/1200 full duplex.

Valid instructions to the built-in software include a wide range of control codes covering most contingencies. For instance, the modem can be programmed to wait for a secondary dialling tone before continuing with the rest of the number, to stop dialling until an underline character (ASCII 96) is sent from the keyboard, to tone-dial or pulse-dial, to wait a pre-set time before answering the phone, to accept new cursor movement sequences, and so forth.

With its own power supply, the Tm

Product: Tandata Tm 512  
Price: £255 (standard model), £275 (Maves compatible), £300 (Maves<sup>®</sup> and SPAD error correction)  
Supplier: Tandata, Albert Road Road, Malvern, Worcestershire WR14 2TA, Tel: 06345 68421



## By GABRIEL JACOBS

512 will hook up to any micro fitted with a standard serial port, and will therefore connect straight into the Amstrad 510 interface. All you require is a straight one-to-one modem cable, which should be wired as suggested in the Amstrad 510 manual, though you can leave out Pin 22 because the software in the modem itself takes care of ringing tone detection.

The Tm 512 will also work with any suitable comma software and any Amstrad model but PCW owners who do not want to access Viewdata files can stick with their free copy of MAAL232.

There's little point in spending money on a clever comma package if you buy the Tm 512 and are only interested in teletype communications such as transferring files, sending and receiving electronic mail, or accessing remote non-Prestel type databases such as MicroLink and Bulletin boards.

The Tm 512 requires only that the software running on the terminal

can provide a screen display, file transfer facilities, and the ability to control the RS232C port - more or less the limits of MAAL232. But if you want Prestel you'll have to invest in some extra software.

Tandata themselves produce machine-specific comma packages which include viewdata facilities, but unfortunately the Amstrad range has not yet appeared on their list. I say unfortunately not only because it makes sense to buy a ready-configured viewdata package, but also because the documentation for these dedicated programs seems very good.

In contrast, the standard Tm 512 manual which Amstrad owners have to rely on is atrocious - all the necessary (and some unnecessary) technical information is there, but it is poorly organised and in places almost incomprehensible.

At the time of writing there have been six issues of the manual, and each has been an improvement on its predecessor. But a huge leap would be required to bring the instructions to a level where a first-time modem



**From Page 26**

user could make sense of them.

Hence the panel (right) on using MAIL332, aimed at passing on the benefits of hours of study, and more hours of trial and error, to PCW owners who have already bought the Tm 512. Those who have not may like to keep the information in reserve in case they ever do.

Having powered up, and loaded a demo program such as MAIL332 into the PCW, you have to send a couple of stars to the modem so that it knows how the SIO interface has been set up. The software in the modem then offers a choice of Directory (on-line) or Program (off-line) modes (it can take ages just to work that out!).

The Directory mode screen presents the eight stored telephone numbers ready for auto-dialling, but it is also possible to dial answered numbers, either manually or by addressing the modem directly from the keyboard.

Program mode invokes Store 5, which serves two purposes. It controls the phone number stores, and holds information concerned with auto-answering.

Again, any of the auto-answer facilities can be implemented manually, and a wide range of options is available, from Chat mode with or without auto line feed, to forcing another modem originating a call to transmit on the high channel (that is, at 1200 rather than 75 Baud).

Once everything is set up correctly it's plain sailing. In Directory mode you press the appropriate Store number.

The modem takes the line (indicated on an LED), a 'Dialling' message appears on the screen, and the modem's internal speaker echoes the usual pulse-dial signals.

When a valid carrier signal is detected the Carrier LED lights up, and the speaker switches itself off. If anything goes wrong, such as a

## In use with Mail 232

In theory the Tm 512 should accept a wide range of SIO configurations. In practice it prefers 1200 baud transmit and receive, 7 data bits, even or odd parity, and 1 stop bit. None of this will actually affect the analogue signal at the telephone interface, so it might as well be set that way as any other.

The Directory mode screen is supposed to display log-on strings and comments as well as the stored number. With MAIL332 only the number is shown - but the rest of the information is there, and is acted upon by the modem.

In Program mode it should, in theory, be possible to program any of the number stores by calling Store 5, but this does not work perfectly on the PCW. A vertical bar (ASCII decimal 134) is required to delimit the phone number from any other string.

This character, when produced on the PCW keyboard by Extra + full stop, sends a raw-line code to the software in the modem, which terminates the instruction

before you've begun.

However it is possible to program numbers directly (using what is known as V230s commands) without invoking the Store 5 option in Directory mode, in which case there is no problem.

Initiate the string with Ctrl+R, enter the phone number and log-on instructions (commands such as delays or carriage returns can now be preceded as they should be with a vertical bar), and terminate with Ctrl+C.

For auto-answering, the best setting with MAIL332 is X, Y or H (respectively for 300/300, 1200/75 or half duplex), plus parity setting, plus D (for carriage return implying line feed), plus F (for zero buffer option, disabling the 256 byte buffer in the modem).

It is also worth setting the time-out period to two minutes. So for V21 300/300 answering, with even parity expected, the commands would be:

```
Ctrl + B PRNS;XESC Ctrl + C  
Ctrl + B LITZ Ctrl + C
```

number being unobtainable, an appropriate message appears on the screen.

Answering the phone is even easier, since you need to do nothing at all if the auto-answer store has been properly configured (see the panel).

Or you can answer on voice, then send a carrier to the originator of the call when you're both ready.

**CONCLUSIONS:** In terms of the local market, the Tm 512 is middle-of-the-range, but unless your requirements are very special - such as 1200/1200 full duplex, very high baud rates, or Hayes compatibility - it will provide everything you're likely to need.

You can find modems which do as much as the Tm 512 which are slightly cheaper, and modems for around the same price (E255). A Hayes compatible version has just been released at E275. With Tandata, however, you know you're buying from a respected firm with a reputation for after-sales service to uphold - and that's got to be worth something. ■

6 A reputation for service has got to be worth something



# UNLOCK YOUR

## PCW 8256/8512

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## Unfair to dealers

**FRANK** with great clarity your sweeping condemnation of dealers in your reply to the letter from Margaret Seale is your forte here.

Although I can sympathise with the view that many high Street dealers will not give demonstrations of packages, it is extremely annoying to be told that all dealers are like this.

I want for a small independent retailer and we pride ourselves on giving a good service to our customers, but in many cases customers tend to sit themselves down when looking for a package.

In one recent case a customer came into our shop looking for a stock control program. He was shown one package and bought it in the full knowledge that it was not a full stock control program.

Yet two days later he phoned to complain that it was not a full stock control and that he was unable to hold 10,000 stock items for 500 customers on an order in the second drive.

To have pre-installed versions of all packages for all machines ready and waiting for demonstration and to know every aspect of every program on every application would be totally impossible.

While I have little sympathy with dealers who wilfully refuse to give demonstrations, at times it can be very difficult for the fickle Middlesex customer and can leave a busy shop short of one member of staff when they can least afford it.

So please have some understanding of what is involved and have some patience with your local dealer. It can be as difficult for him to sell you a program as it is for you to buy one.

On to this issue and off-handed comment I had regarding your magazine as one of the best available, as usual now, your editorial has



been unbiased and fair.

However, I am wonder if you have a full grasp of the industry in general when these kind of comments are made.

Dealers often spend many hours of their own time learning about new products and packages and to be listed in the book in such a manner does little to help our enthusiasm — **Phillip Davis, Hull.**

**PS:** The views expressed above are my own and not necessarily those held by my employer.

■ You are right to kick me back. Please accept my apologies. My remark "Dealers are not all they should be" was far too generalised. My own beloved local dealer gently pointed this out to me too, and I agreed I ought to have written "Some dealers..." or "Certain dealers..."

On the other hand, it has to be recognised that the PCW has caused a new kind of problem. It is being marketed in vast numbers, yet from the start was aimed at new users, who obviously need maximum support and advice.

In particular they do not want to make expensive mistakes, and one way of avoiding them is to see a product in action before making a decision.

Software for the PCW may appear cheap to those of us who for years have been used to IBM PC prices, and certain dealers simply cannot be bothered, perhaps understandably, constantly to provide demos when profit margins

are low.

But I stick by my view — and from what you say, I think you will agree — that from the point of view of the consumer, the more pressure that is put on such dealers to come to terms with the new market, the better the service we can expect in the future.

**Gabriel Jacobs**

## Cardbox labels

**GABRIEL** Jacobs can't have spent very much time using Cardbox before he wrote his review in the June issue of Business Computing with the Amstrad.

He said in the review that Cardbox can't print labels on a roll. This is simply wrong, and I'll explain how my Cardbox is managing it very happily.

Having set up a database you create an alternative format for labels for the information in the database and set up the print format of that new format to fit with the type of label roll you're using.

My labels are 1 1/2 in wide and just gap before the next label, and so there's one tiny overlap with a line pitch of six lines per inch. Thus the print format on my **MAILING.FMT** file are as follows:

Page size = 8. Next page = Four lines. Top margin = 1. Left margin = 12. Entries per page = 1. Blank lines between pages = 1.

The only other thing that

needs to be done is then write a CPW file you use the PAPER utility to set the printer up to print on label roll. In the case of the label roll I am using the command reader is: **PAPER P.S. p 1, a, p 0.**

This utility is all explained in the manual (CPW version; page 90-91).

The same overall effect can be achieved more easily by creating a .SLB file which will set the PAPER utility settings and then take you into Cardbox. Mine is called **CARDBOX.SLB** and reads as follows:

**PAPER P.S. p 1, a, p 0**  
**SETUP'S HELP.WF**  
**CARDBOX**

Thus its print labels will do it, load up CPW and then type in **SUBMIT CARDLX** and I'm into Cardbox with the printer already set to print labels for me.

Cardbox may have its weaknesses in its inability to set up its own addresses, but printing labels isn't a weakness! And no, I don't work for Canon. — **Steve Walton, Basingstoke, Wilt.**

\*\*\*

**THE** article by Gabriel Jacobs on **CARDBOX** in the June Business Computing with the Amstrad was fairly accurate and Mr Jacobs had obviously done his homework.

There was however one error which involves a major feature of the product, generating prospective users to call so it is clearly this point I'm worried about those who did not call.

The second last paragraph on page 37 reads "Finally, although fields can be incorporated into standard letters for mailshots, the program will not generate labels on a roll as the printer — something which further limits its business market".

To set the record straight, the program will generate labels on a roll as the printer simply by making a selection of those records for which one wants labels, setting an alternative format for labels and sending them to print, the whole operation taking a





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