40p EVERY WEEK · No 101 · MAR 2 1985

PERSONAL Computer NEWS

AMSTRAD DISK POWER
Rave review

WHAT NEXT FOR BBC & ELECTRON

ACORN QUITS HOME COMPUTING

CUSTOMISED QL
Easy routine for a quicker Quill

64 ADVENTURE
The latest quest from Melbourne House

SPECTRUM REVEALED
Free disassembler cracks the code

PORTABLE CP/M
Business computing on the Dialtex 4

DRIVE A HARD SOFT BARGAIN.

'Buffalo Round Up'

'Spatial Billiards'

'Dancing Monster'

'Save Me Brave Knight'

'Photon Reflection'

It's not every day you get offered a bargain as good as this: five games in one package for just £9.99.

And not just any old games, but really outstanding, exciting and unusual ones.

No other games collection comes anywhere near the 'Fantasy Five.' Each game is unique and demands very different talents of the player.

In 'Buffalo Round Up' you can see how you'd have made out as a wrangler in the Wild West. You have to be both skilful and fast to corral the buffalo before they stampede off into the desert.

Then you can test your skills in three unique variations of the traditional game of billiards, with 'Spatial Billiards.' It's billiards in 3-D in a gravity-free room!

In 'Dancing Monster' a wicked wizard has cast a spell on a beautiful princess. To stop his evil, you have to shoot off his horns, eyes, nose, ears and so on while he continues to dance. Defeat the monster, and you'll be astonished by his transformation into...?

FIVE GAMES FOR ONLY £9.99

Then you can don your shining armour and rescue your true love from her evil captors' castle. 'Save Me Brave Knight' is full of evil monsters and fire-breathing dragons, and is exceptional in its graphic style.

If that sounds a little down-to-earth, how about 'Photon Reflection,' where aliens make the final assault on your galaxy. As the Supreme Commander you must capture their Mother Ship. It's a strategically demanding game with a unique laser-shooting sequence using reflectors. Tricky!

The unique design of all these games means they will make the very most of your Commodore 64's capabilities. They're available on either cassette or disk.

commodore
HARD SOFT TO BEAT

FOR MORE INFORMATION CONTACT: COMMODORE INFORMATION CENTRE, 1 HUNTERS ROAD, WELDON, CORBY, NORTHAMPTON NN7 1QX. TEL: CORBY (0536) 206252

MENU

COVER STORY

Avanti ACORN

What does the future hold for Acorn users whose supplier is now in Italian hands? The first casualties will be the Electron which never took off in its present form, and other aspects of Acorn's activities in the home computer market.

OUTPUT

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A short patch for the Quill will make word processing faster and easier. See for yoyrself. . .

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Not a way to reduce your Sinclair to a pile of bits but the painless way of examining machine code. This free utility will help you get to grips with op-codes and address modes.

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They're here at last and what can we say except: 'brilliant', 'buy one' (but read the review first).

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Blunders, buffoonery and a few dates for your diary.

MONITOR

Olivetti turns Acorn around

Acorn is pulling out of home computing in the wake of Olivetti's rescue act last week.

Acorn clearly intends to turn off the Electron's life-support system. A company statement following the takeover spoke of the need to 'further reduce Acorn's dependence on the volatile home computer market'. Chris Curry hinted as much last month when the price of the Electron was slashed by £70.

The BBC Micro, under the new regime, will revert to its specialist educational status. Elserino Piol, Olivetti's man in charge of corporate strategies, aims to make the machine the world's leading educational micro.

Neither Acorn nor its new Italian owner would say anything definite last week about individual machines but the writing has been on the wall for the Electron since Christmas.

According to Signor Piol, Olivetti had been on the lookout for possible 'partners' in the UK for the past six months. Acorn may prove particularly suitable since Italy has as yet no equivalent to the BBC scheme.

Olivetti's plans for the BBC machine itself are to capitalise on its value as an educational micro. Commenting that the education market lacks a leader, Signor Piol said: 'This leader could be Acorn.' Direct support for the BBC Micro will probably be channelled into education, and other types of user may have to rely on third parties.

The new Acorn is split into four parts: education/training, scientific/industrial, business, and consumer. Ninety more jobs will be lost on top of the 30 that have already gone.

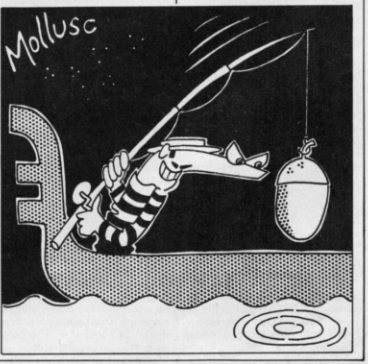
The fate of the ABC series of business machines is uncertain. Acorn could become a manufacturer of systems to which other suppliers would add value before selling them under their own labels. But Olivetti already has a line of competitive business micros, and through its links with the US giant AT&T has access to other types of office systems. Just as Olivetti has the option to raise its Acorn stakes above 50 per cent, AT&T will eventually own 40 per cent of Olivetti.

The BBC said that it was 'entirely satisfied' with the agreement between Acorn and Olivetti. Asked whether it saw any inconsistency in the British Broadcasting Corporation's name being attached to an Italian-owned microcomputer, it repeats its entire satisfaction.

But ACT said that the BBC's position was untenable. 'People really must understand that Olivetti has control of the company,' said ACT's Peter Oldershaw. His boss Roger Foster said last week: 'We will certainly be getting in touch with the BBC to suggest, politely, that the time has come for a change.'

Sir Clive Sinclair would also welcome a change in BBC policy but his comments were more sympathetic. 'It's a great relief — it would have been a tragedy if Acorn hadn't managed to re-structure,' he said.

Continued on page 2



Acorn users face uncertain future

Continued from page 1

Users of Acorn machines need have no immediate fears about support. Acorn's bankers are standing by to stump up an extra £6 million when negotiations with the company's creditors have been completed. These talks have been given a good start by the patience of AB Electronics, Acorn's largest creditor, which has accepted a phased repayment of its debt with some conditions. No supplies are likely to dry up completely.

But when the ink has dried on the contract and the dust has settled, it's the attitude of third-party suppliers that will be critical. Wherever Olivetti positions the BBC Micro, independent suppliers will be able to rely on a large existing user base. The same can't be said of the Electron.

The vicious circle that traps all slow-selling micros will gradually overwhelm the Electron. BBC Micro users will be able to look forward to continuing developments from the likes to Watford Electronics, Cumana and Pace, but the market for Electron add-ons and software will be far less enticing for the independents.

The only positive rumours about the Electron's future hint at the possibility that Acorn might produce more sophisticated and more expensive versions — the BBC Micro might fit that description.

Ironically, the independents have generally been quicker to produce accessories for Acorn systems than Acorn itself. But Acorn admits that it spread itself too thinly. Its plan from now on is to concentrate on specific areas where it reckons it can make money — 'tightly managed profit centres'.

Research and development is central to these activities, and Signor Piol described its R&D potential as one of the company's greatest attractions for Olivetti: 'The key point is that Acorn is the largest information technology company to come out of Cambridge University recently, and this is a technological centre where we would like to be present,' he said.

Sir Clive Sinclair echoed this with a criticism of UK companies in general. 'It took a foreign company to save Acorn, and it's a pretty poor reflection on British companies who couldn't see the opportunity.'

The concensus in the industry last week was that Olivetti had picked Acorn up cheaply. Signor Piol clearly intends to make the most of the bargain: 'On the English market, where it has a high profile, Acorn will be fully independent and will operate in parallel with British Olivetti. We shall act as an amplifier on the other markets particularly in the education sector.'

Olivetti will nominate two board members who will 'monitor programmes and results, step by step' according to Signor Piol. Chris Curry and Herman Hauser, the founders of Acorn, will stay on the board but with much less say in the running of the company. Dr Alex Reid will act as chairman until a new group managing director is appointed.

IN BRIEF

Software shippers are under fire from the Advertising Standards Authority. The Software Library of West Liss, Hampshire, is criticised in the ASA's latest report for exaggerating its range of titles and the Software Supermarket of South London had a complaint against its advertised claims upheld.

Prizes of a Porsche, £1,000, and software are on offer from Firebird, Adventure Zone and Cheetahsoft respectively. To win the Porsche you have to crack Firebird's Gyron, the £1,000 goes to the best adventure submitted to Adventure Zone, and if you find your way around Cheetahsoft's Parky and the Yellow Submarine you'll win the second Parky game.

Sir Clive might be shy of going public with Sinclair but Martin Vlieland-Boddy, once of Torch and now of Active Technologies, hasn't been deterred by a little panic in the City. Active, designer of the Graduate IBM add-on for the BBC, has just raised £200,000 on the stock market.

Quicksilva has bought the rights to seven Bug-Byte titles and its managing director Rod Cousens is looking forward to 'other areas of involvement at a later stage'. Quicksilva itself is a part of the Argus group, and consolidation of the software business looks on the cards.

Research Machine's new Nimbus (issue 97) is now available to users in education with Microsoft's Word and Multiplan at a discount.

Sinclair moves to quash supply fears

Redundancies at Commodore and the debacle at Acorn may have left the micro market in a state of near panic, but Sinclair Research has no intention of going the same way.

On the face of it, recent news from Sinclair is bleak. The company has cut back on deliveries of machines to stockists, postponed the US launch of the QL, and lost the distributor Lightning as an outlet for its hardware. But a spokesman was keen to point out that these developments had no long term significance.

Overstocking during the Christmas period is blamed for 'a short term rescheduling of supply and production.' This rescheduling should only be a matter of fine tuning over a couple of weeks, and there seems no prospect of Sinclair being lumbered with an Electron-style Spectrum mountain.

The postponement of the US launch of the QL until May is blamed on the machine having to comply with US domestic appliance regulations, which means that the US version of the QL will have to sport some kind of internal shielding to suppress electrical interference.

Sinclair will be sending Nigel Searle, a long-term trusty of Sir Clive's to head up the US operation, and points to this as evidence that the company is taking the market seriously.

And Lightning? The company is a major distributor, but has never been a front rank Sinclair distributor. Lightning is to stop handling Sinclair hardware in favour of Amstrad, although it will continue to deal in Sinclair software. The company blames erratic supply.

Plus/4 waves engulf Commodore head

Commodore has its feelers out for a new general manager after the shock resignation of Howard Stanworth.

Stanworth parted company with Commodore under amicable circumstances, Commodore says. But his resignation followed hard on the heels of the 50 per cent price cut to the Plus/1, which is understood to have put the cat among the pigeons throughout the Commodore hierarchy.

Officially Stanworth presented the price cut as an opportunist response to market conditions (*ie* Acorn's difficulties) but it was widely interpreted as indicating that the days of the Plus/4 itself were numbered, thanks to lack of interest from software suppliers.

Boots backing gives Opus the edge

The launch of the new Opus disk system (issue 100) could herald a new era for the Sinclair Spectrum. One of its big bonuses is the support being given it by Boots with a selection of software on disk.

The software houses involved include Activision, Romantic Robot, Hewson Consultants, Micro Mega, Melbourne House and Database Publications. The likelihood is that old titles will soon be followed by new ones.

With Boots leading the way, the Discovery 1 may well be able to capture the Spectrum disk drive market which, so far, is still wide open. It costs £200 and you can add a second drive for £140.

Acorn deal gives Oric fresh hope

Poor old Oric is still in limbo. The receiver, Dennis Cross, had a meeting with Barry Muncaster, ex-chairman of Oric and Edenspring Investments, last week, but it wasn't possible to close a deal.

Mr Muncaster is currently involved with a French syndicate which has put in a bid for Oric. The syndicate has the backing of Oric's French distributor, ASN, but Mr Cross sees Olivetti's intervention in Acorn as evidence that he could get a better offer for Oric.

To this end he'll be placing an ad in the Financial Times.

If you have a seven figure sum to spare you'd best keep a lookout.

THREE-WAY TIE — The QL assembler from GST is now being published by Sinclair. It costs £39.95 and is a non-relocatable Motorola format-compatible 68000 assembler, and includes the multi-tasking Metacomco full-screen editor, which has been adopted by Sinclair as its standard. The editor and the assembler can be run simultaneously with SuperBasic, allowing users to switch instantaneously between all three individual functions of the QL. The assembler will be available through all the usual Sinclair outlets.

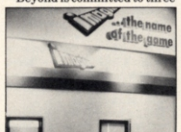
MONITOR

Software producers LET loose at last

April showers could turn into a deluge of new software this spring. New releases were thin on the ground at the LET (Leisure, Electronics and Trade) Show in London last week but there were plenty of pre-release versions of games.

The cream of British software producers managed an air of cautious optimism and relaxed sufficiently to talk about — and demonstrate — what's coming up in the next few months.

Beyond is committed to three



Imagine — what's the game?

April launches, Spy vs Spy (Spectrum), Romper Room (educational) and Shadowfire (due out April 17). The latter was shown at CES in Las Vegas and attracted considerable interest.

The Amstrad was the machine of the show, at least in terms of future plans. Most publishers were looking to it as a third machine, along with the 64 and Spectrum, and some went so far as to declare they were dropping out of the Spectrum market in favour of the C64 and CPC 464, 'because of their overseas sales'.

Micro Power was showing a very early version of its Amstrad ROM software and plans to produce a motherboard in the next couple of months. This will have at least four ROM bays and you'll be able to get word processing, database and spreadsheets on ROM soon. RSX Systems is also looking to Amstrad hardware, *eg* a motherboard and a RS232 port using the system bus.

Picturesque will launch its acclaimed assembler package on the Amstrad in April.

Firebird at the double — Elite previewed on the Commodore 64.

CRL was still plugging its Rocky Horror Show, but that's turning into another Great Space Race and the odds are it's going to be just as much of a disappointment.

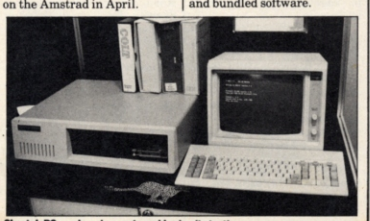
Firebird seems to be going from strength to strength, though it may have rushed its Commodore 64 Elite conversion to the detriment of the game — it will be reviewed soon. It was also showing Gyron, one of the most complex Spectrum games we've ever seen, and graphically brilliant.

PCN readers with long memories will recognise the game as Hedron, covered in these pages well before Christmas.

Activision's new range shows that the company is doing well, but still has a long way to go. Backing the strong musical theme is a good idea, but as yet its games have been of inconsistent quality, though steadily rising in line with its prices.

Imagine is finding new life on an Ocean wave but the monastic cell behind its frontage was off-limits to your reporter. Harassed figures emerged from time to time saying only that they were too busy to talk.

Not so with Cheetah Marketing, where an IBM compatible sat incongruously among the games and the interfaces. 'It's 100 per cent compatible,' enthused Howard Jacobson of Cheetah. The machine comes from the US, will be maintained in the UK mainly by a dealer network which is in the process of being set up, and will start at about £1,800 for a 256K system with twin floppies, a monitor, and bundled software.



Cheetah PC — changing spots and baring its teeth.

HOMEFRONT

There's no FAST solution to piracy

Attention all you pirates, put your parrots on the alert for the cops and stash your pieces of eight FAST. The Federation Against Software Theft is out to get you.

The second reading of a Bill giving the police powers to combat software pirates is due on Friday, February 22. And, with the support being given to it by that bunch of do-gooders in Westminster, it will no doubt get passed.

Whether it will do any good or not is open to debate, since even faced with the power to raid their pirating dens, the swashbuckling latter-day corsairs of the computer industry will probably not be bothered — they'll just be a little more circumspect and professional.

In addition, most commercial software these days is sufficiently uncopiable to deter all except the most case-hardened hacker.

FAST's chairman, Donald MacLean (not the American Pi-man), has said in the past that home piracy is not really the problem; the real menaces are the professional commercial pirates who copy software and mass market it under the same label, at a cheaper price.

The FAST solution to this problem is not to use a standard locking technique, although at the same time it publicises standard techniques either under development, or currently available.

One system that keeps rearing its attractive head is the use of a dongle (whether purposefully, or accidentally). This is a piece of hardware that plugs into the micro and whose presence is checked for by the software. If it is not present, then crunch.

The problem is that it tends to add quite a lot to the cost of the software, possibly more than is being lost through pirating.

Other slightly more subtle methods include putting duff tracks or ID codes on the disk where they cannot be copied but can be read, if you know where to look. If they are not found, some systems die, while others perform the neat trick of running for a while and then slowing down, eventually grinding to a halt with a nasty message.

There is an argument that protection on commercial software causes more problems to the user than it solves. Micropro has recently announced that it has dropped the protection on Wordstar 2000 due to the problems that occur when installing it on a number of PC compatibles.

As software becomes more and more sophisticated, so does the protection needed to stop the pirates. Unfortunately, as the software gets better, then so do the freebooters.

This does serve the possibly useful purpose of making programmers who pirate software better programmers. For instance, there is the story about one software company which trains its programmers by forcing them to crack protection before they are allowed to write any commercial software.

A quick review of the general methods of copying seems to indicate that as the industry comes out of its infancy, the software gets better and more expensive, hence the need for protection becomes greater. For commercial systems, the corrupt track and hidden code number methods are currently the most popular.

Cassette software poses a few more problems since the easiest way of copying is with a dual drive 'Ghetto blaster'. In the past, the two methods of trying to beat this have been to make the tape a non-standard length and to alter the volume level on the original to the critical point where the copy's volume is too low.

Another favourite method is to include a colour-coded chart with the software. After the program is loaded, it asks for the colour at a certain point on the chart. If you get it wrong then the program clears itself from memory.

If and when FAST gets the court backing it needs, it will only be able to attack commercial pirates. Home copying will remain with us for good. And as with the home copying of records on to tape, there is really no way to enforce any laws, no matter what the penalites may be.

The upshot of all this is that software freebooters will be around as long as there is fun and booty to be had from pirating and FAST may be wasting its time since it'll never touch home copying and commercial software is already pretty well uncopiable.

Kenn Garroch

MONITOR

Chop falls on BBC Radio's Chip Shop

The Chip Shop has got the chop. BBC Radio's most popular contribution to home computing has gone off the air, perhaps for good.

A BBC spokesman said last week: 'It's not coming back in the immediate future, but that doesn't mean to say it's gone away for ever.'

But the return of the Chip Shop, which opened on Radio Four and later found a slot on Radio One as well, may depend on the BBC being granted permission to raise the licence fee to £65. This is far from settled, and if the fee is increased the Chip Shop will have to take its place in a queue of projects that are starved of funds.

'It was rather expensive to produce,' said the spokesman. 'The Chip Shop was going to be produced in Manchester but that proved to be expensive,' he added irrelevantly.

The removal of the Chip Shop leaves the BBC's radio coverage of micros slanted strongly towards the highly technical subjects of its educational broadcasting. The writing has been on the wall since the turn of the year, when the Corporation's pleas for a higher licence started to win wide publicity.

Four weeks ago we reported that the Basicode programs transmitted by the Chip Shop were about to be cut — now the whole programme has gone the same way.

Local radio stations, meanwhile, are going from strength to strength. In particular, the programmes developed by Radio West in Bristol are now widely syndicated and broadcast over much of the country, with the greatest concentration in southern England.

But where the BBC tried to make the compromise of Basicode work, the local stations have broadcast machine-specific software.

Basicode is an attempt at a transportable Basic; in the form of telesoftware it could be down loaded on to any one of 19 micros, but in order to be transportable it had to be limited in scope.

The BBC found it expensive to produce for a return that was difficult to measure — the devisers of Basicode intended it as a non-profit-making system.

BBC Television, by contrast, is expanding. Micro Live is due to go weekly and two new series are planned.

Currah customers get cossetted

Currah customers must be the best cared-for consumers in the UK as the war of words between DK'Tronics and Welwyn Systems rumbles on.

Both companies are selling the products of the now defunct Currah (issue 95) and both are determined to give after-sales support. Last week the battle moved across the Atlantic, with DK'Tronics boasting of large orders for Currah products and Welwyn opening its US sales operation with Steve Currah at the helm.

Faced with the founder of the deceased company, DK'Tronics claims that it has Currah's design engineers, not to mention intellectual rights to the products. The rivalry could go on and on but the upshot for users looks like being a prolonged period of cossetting.

As an appetiser, Welwyn has combined Currah's Microspeech and Microslot in the MicroPac for the Spectrum. The package costs £25.95, as against the £44.90 that the two items would cost normally.

TALK SHOW — It may not be much to look at, but the Cambridge Microcomputer Centre's Namal SC10 prefers to let technology speak for itself. The unit is a 'type and talk' dedicated speech computer — with a Z80, a Votrax speech chip, and 10K of assorted memory it converts typed text into speech. You can connect it to 'any computer with RS232 serial link or Centronics parallel link,' CMC says, and it promises a number of refinements that aren't too common in this type of device — pronunciation of various symbols, adjustable speed, four inflexion levels, variable delay times between phrases and a choice of modes. CMC is on 0223-355404. The SC10 costs £149 plus VAT.

VIEW FROM THE US

ACT — Apple of America's eye?

US computer fanciers are often shocked when told about Britain's large, turbulent micro scene. The tendency here is to lump the US and Japan together in the Computer Age, and to think of the rest of the planet as various grades of 'World' (that is to say, Communist, Free, Third, Post-Industrial, Developing etc). Of course, Americans have the right to be as provincial as anyone else, so over here the UK has come to mean Royalty, comfortable pubs, rock music and mass unemployment. British products are virtually unknown outside of booze, quality television serials, and ultra-expensive cars.

All of which might help to explain why poor old ACT sold a mere 110 machines in its last crack at the US market, despite wads of adverts and promotions and good reviews in magazines. Nobody could imagine a UK computer. Now ACT is back with a reported $7 million in launch money and its line of handsome MSDOS computers. The target is Apple and the equipment is reasonably priced vis-a-vis IBM. The basic Apricot is to sell for $1,495 with 256K and one disk drive and it looks well set between the current $1,700 IBM of similar configuration and the Tandy Model 1000. ACT's software agreements with Ashton-Tate, Microsoft and Software Publishing should have Framework, PFS, Word and others available shortly. With a force of former Apple reps working the independent computer shops, ACT hopes to get an edge on Apple for small businesses.

Of course, this may be tough now that Apple has Laserwriter and Appletalk out. The Laserwriter is basically a Mac inside a Canon PC copier. Appletalk connects Macs, IBM PCs with an Apple board inside, and the Laserwriter. Because the machines are so smart the network can carry everything, and in shorthand codes — up to 30 Macs can be linked to one Laserwriter. The print quality is fantastic, 300 dots per inch, and analysts predict doom for small printing and typesetting businesses as the technology spreads. This is the heart of the MacOffice on which Apple has a lot riding this year.

At IBM there has been a period of strong ups and downs. First, with a thump that hurt on Wall Street, IBM announced no earnings increase for the quarter and blamed the over-strong dollar for flattening overseas currencies. On the upgrade was the launch of the Sierra 3090 mainframe series, the new flagship of the line.

From California came great vibes about the Hackers Conference last November, an event already being called the Woodstock of the computer elite. Held at Fort Cronkite in Marin County above the Golden Gate bridge, the conclave was thick with names — Steve Wozniak, Bob 'VisiCalc' Frankson, Cap'n Crunch, Charles 'Forth' Moore, et al.

Things kicked off with whirls of conversation about such matters as software protection and whether Unix will save the world. Then the power failed. This rendered all the computers useless. Undaunted, the hackers ate by flashlight and then debated in a room lit by oil lanterns. In so far as anyone could see them, rifts appeared between the 'information uber alles' crowd and the software writers, who scowled at the chorus for free software that went up from time to time. Then the power came back on and everyone thundered down the stairs to the computers and began an orgy of hacking.

Software news — they say venture capitalists are out of computer hardware and almost out of software firms as well, but they are in when it comes to software with good 'AI' (artificial intelligence) properties. Says Mitch Kapor of Lotus, 'AI could become the most abused industry buzz-word of 1985'.

Microsoft is working on a passive learning program that monitors its user's movements to detect work patterns. Then it suggests ways of improving work habits and offers advice on how to make the software do more. An 'active' program starts out by asking users to describe their usual working routines, then comes up with simplifications or even takes them on itself.

Finally, Steve Wozniak, 33 year-old co-founder of Apple, has announced that he's leaving the company to start up a home video products company. New video products? 'Based around the use of video in the living room, it will not replace anything that already exists.' Also leaving with Woz on the new venture are the engineers of the Apple IIc and Apple IIc machines.

Chris Rowley

CHARTS

GAMES

TW	LW	TITLE	PUBLISHER	MACHINE	PRICE
1	1	Ghostbusters	Activision	SP,C64	£10.90
2	4	Technician Ted	Hewson	SP	£5.95
3	2	DT's Decathlon	Ocean	SP,C64	£6.90
4	5	Zaxxon	US Gold	SP,C64	£9.95
5	3	Match Day	Ocean	SP	£6.90
6	12	Monty is Innocent	Gremlin	SP	£6.95
7	9	Brian Bloodaxe	Edge	SP	£7.95
8	6	Impossible Mission	CBS/Epyx	C64	£9.95
9	—	Raid over Moscow	US Gold	SP,C64	£9.95
10	7	Blockbusters	Macsen	SP,C64,AC	£7.95
11	11	Elite	Acornsoft	AC	£15.00
12	8	Airwolf	Elite	SP	£7.95
13	13	Knight Lore	Ultimate	SP	£9.95
14	16	Battle for Normandy	US Gold	C64	£9.95
15	—	Alien 8	Ultimate	SP	£9.95
16	—	Lords of Midnight	Beyond	SP,C64	£9.95
17	19	Blue Max	US Gold	SP,C64	£9.95
18	18	Booty	Firebird	SP,C64	£2.50
19	17	Select 1	Comp Record	SP,C64	£12.49
20	—	Software Star	Addictive	SP,C64	£6.95

SPECTRUM

TW	TITLE	PRICE
1	Technician Ted	£5.95
2	Ghostbusters	£9.95
3	Zaxxon	£9.95
4	Match Day	£6.90
5	Monty is Innocent	£6.95
6	Brian Bloodaxe	£7.95
7	Raid over Moscow	£9.95
8	DT's Decathlon	£7.90
9	Airwolf	£7.95
10	Knight Lore	£9.95

COMMODORE

TW	TITLE	PRICE
1	Ghostbusters	£10.90
2	Impossible Mission	£9.95
3	Battle for Normandy	£9.95
4	Lords of Midnight	£9.95
5	DT's Decathlon	£7.90
6	Combat Leader	£9.95
7	Frak!	£7.99
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These charts are compiled from both independent and multiple sources across the nation. They reflect what's happening in high streets during the week up to **February 21**. The games chart is updated every week. The prices quoted are for the no-frills model and include VAT. Information for the top-selling micros is culled from retailers and dealers throughout the country and is updated every month. PCN Charts are compiled exclusively for us by RAM/C, who can be contacted on 01-892 6596.

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Sir Clive won't catch me again

I am now in the unenviable position of being caught twice by Uncle Clive's unannounced price cuts on the Spectrum.

My first Spectrum was bought for £175 — two weeks later it came down to £129. Recently I decided to buy a Spectrum Plus and duly forked out £179.

I should have realised that it was the company's intention to replace the old Spectrum with the Plus, despite the strenuous denials. Of course, soon after buying it, the price dropped by £50 and in neither instance was I able to get a refund.

Now I am much wiser and can offer what must be a dead cert tip to anyone considering buying the current QL or the forthcoming enhanced and more expensive QL.

I have no doubt at all that again, despite the denials, a short while after launching the more expensive model (and presumably recovering the development costs) the price will come down to the current £399 and the current QL will no longer be available. You can fool some of the people some of the time . . . etc.

Colin Smith,
Bournemouth.

Memotech must have slipped your memory

I'm aware that the computer press in this country suffers from a severe case of myopia when it comes to coverage of the microcomputer industry (ie Spectrum, Commodore 64, BBC and Amstrad are the only ones in vision), but surely when someone asks for advice you should put some glasses on.

Admittedly Brian Turner (Routine Enquiries, issue 98) did not mention the Memotech computer in his question but that was possibly because he is unaware of its facilities.

The graphics (including sprites) and sound on the Memotech are excellent and are easily manipulated from within Basic. With its built-in assembler and front panel the Memotech allows the owner to move into assembly language programming without any extra expense.

Given these features the Memotech fits Mr Turner's requirements down to the ground but you failed to include it in your reply.

The standard rebuff to those people pushing the numerous advantages of the Memotech is that there is very little software available. This has become a fallacy because the software scene has improved a great deal and with the developments which are under way software will soon be available in large quantities.

It may be of interest to your readers that Genpat, the Memotech computer users club, will be launching a speech synthesiser and a graph pad within the next few weeks.

Tim Rothwell,
Genpat, 3 Bulcock Street,
Burnley, Lancs.

Why is the Amstrad left in the cold?

I'm writing to throw down the gauntlet to all software houses — especially Amsoft, Ocean and US Gold — to produce or convert some decent games for the Amstrad CPC 464. If both US Gold and Ocean can convert software from the Commodore 64 to the Spectrum surely they can convert these games to another computer which uses the Z80 processor?

At the moment, Amstrad users are being given substandard rubbish — Harrier Attack, Hunchback and Alien Break In, to name but a few. I am beginning to wonder if this excellent machine is going to be another Dragon, Oric or, dare I say the dreaded word, Lynx.

If Amstrad users buy some of those pathetic games, there ought to be a mad rush to buy top quality programs like Pole Position, Raid Over Moscow, Zaxxon, TLL, Daley Thompson's Decathlon and Beach-Head.

David Montgomery,
Vellshill, Lanark.

Timely tips for ZX81/ Memotech problems

Re Mr Gardner's ZX81/ Memotech problems (issue 99), I suggest he tries the following.

1 Disconnect printer.
2 Remove QSAVE from set-up. Ear lead only to tape.
3 Load program, or to prevent auto-run, FAST, RAND USR 836 and program loads. Re-save it on your tape recorder.
4 Check that it's loaded properly by commencing program execution after the SAVE statement in the listing.
5 Swap to Mic lead only and see if your copy loads all right.
6 Switch all off, re-position tape, connect up printer and try loading again.
7 If this works, try with QSAVE in place. QSAVE Mk1 does not have a load/save switch.

By much the same procedure you may also find that QSAVE really does still work, either at 4000 Baud or even, heaven forbid, at 250 Baud.

8 Does Mk2 QSAVE give a 0 after loading? With the software that came with Mk1, it's a fairly simple matter to re-locate QSAVE to any address that integer divides by 256. There are also start and stop bytes. If one only saves/loads to just above E.LINE, then a 0 is generated, just as verify does.

I think it is the loading/saving over itself that generates the random number upon loading. (Mine was a preset 16K version). It's a shame that Mk1's documentation does not describe the flexibility of QSAVE.

When I have eventually got my Amstrad sorted out, I may even return to an incomplete project to give QSAVE a load/save header. There is less chance of error if QSAVE only saved, say 4K, when only 4K of program is present.

9 You may find point 8 to be a little esoteric, and I am assuming the software/documentation is unchanged. May I also assume your ZX81 is a recent one? The very first ZX81s had a slightly different ROM. Hopefully, commercial software still checks and adjusts to the old ROM.

10 Don't give up because of the Alpacom 32/RAM.

H Williams,
Brackley, Northants.

I fervently hope this makes sense to ZX81 owners — Ed.

Firey retort from Dragon users group

A rival magazine to your good selves (*Popular Computing Weekly*) recently printed a list of all National User Groups and Clubs. The article implied that it covered all user groups.

Not so. I had sent in the application form and copies of the newsletter on behalf of the National Dragon Users Group which has been in operation for about six months. *PCW* said no-one was very interested in Dragons anyway.

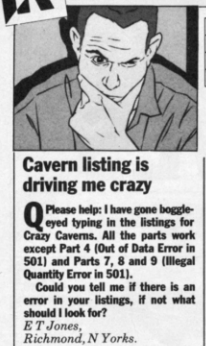
I have always bought your magazine and *PCW* each week but in the light of this I shall be buying only one per week. Guess which? At least you have acknowledged our existence by publishing letters that have been sent to you, and in fact have been instrumental in helping us acquire new members.

Therefore if anyone wants more information regarding our group, contact Paul Grade, 6 Navarino Road, Worthing, Sussex, enclosing an sae.

Neil Scrimgeour,
Corby, Northants.

If there's any problems, Sinclair will exchange it for a C5.

ROUTINE ENQUIRIES



Suffering from circuit crunch or data dyslexia? Want some sound advice on speech synthesis or the best type of printer? Then consult the experts. But remember, no SAEs, 'cos we can't reply personally. Address your queries to Routine Enquiries, *PCN*, Evelyn House, 62 Oxford Street, London W1A 2HG.

Cavern listing is driving me crazy

Q Please help: I have gone boggle-eyed typing in the listings for Crazy Caverns. All the parts work except Part 4 (Out of Data Error in 501) and Parts 7, 8 and 9 (Illegal Quantity Error in 501).

Could you tell me if there is an error in your listings, if not what should I look for?

E T Jones,
Richmond, N Yorks.

A If cries of help are any indicator of popularity, Crazy Caverns has to be the hottest listing we've ever published. So, for Mr Jones and the dozens of others who have written and phoned for guidance, here is the definitive explanation of Crazy Caverns.

First, with the exception of the four-line correction published in issue 99, the listing is bug-free.

The second point concerns the order in which it should be typed in. Begin by entering and saving the two-line set-up routine in issue 97. Then enter and save Parts 1 to 16. Tape users *must* save them in the correct order; disk users can save them in any order although it makes sense to maintain the sequence. This completes the actual Crazy Caverns program.

Part 17 is a separate program in its own right, and should be saved on a different tape. It will generate a pure machine code version of the game later.

Finally, Part 18 is a third program — a loader for the machine code version produced by Part 17. Save this on a third tape.

Next, you may have a couple of problems decyphering some of the symbols in the listing. They are generally confined to Parts 16 and 17. In line 550, Part 16, the backslash should be £ sign, and again in Part 16, the symbol should be the up-arrow. Our printer couldn't cope with these.

In Part 17 some of the print statements don't have ending quotes marks because these are optional on the 64. Although some of the other symbols look strange in the listing, they will be correct on the screen since the programs redefine the character set.

The biggest problem everyone is encountering with entering the listing comes in line 501 of each part. You'll usually get one of two error messages: Out of Data or Illegal Quantity. The first is obvious — you've missed a number or perhaps a whole line out of the listing.

The second is more baffling and means one of two things: either you've missed a comma, or the program is attempting to POKE the checksum into memory.

Illegal Quantity errors usually come when you try and POKE into memory a number greater than 255. If you get one of these two error messages you know you've made a serious mistake when typing.

If you've made a minor mistake in one or more numbers, the program will end with the simple Error In message followed by the line number.

Once you have each part debugged and saved you can move on to the next stage.

Take your tape containing the two-line loader and Parts 1 to 16 and then load and run the first bit. The rest of the program will autoload and run without any intervention until you get the instruction screen. Start the game and then break it with the Run/Stop key. Remove the tape from the cassette player and insert the tape containing Part 17, Saver.

Load Saver then remove that tape and insert the third tape containing Part 18, the final loader program. Position the tape to start just after the end of Part 18.

Run Saver which will create two new machine code files called Data1 and Data2 and automatically save them to tape. Finally, switch off, reload Part 16 only and save it after Data2.

This means you should end up with a tape containing four files called Part 18 (or you might call it Crazy Caverns), Data1, Data2 and Part 16. You can then LOAD "CRAZY CAVERNS" and the game will then load and run much faster than from the Basic versions.

My NEC banks won't talk to each other

Q I own a NEC PC8201A lap portable with full internal expansion, but banks 1 and 2 don't seem to be on speaking terms.

There's a utility supplied free with the machine to allow you to transfer files from bank to bank, but as it takes up 12K in each, it defeats the point of expansion. What am I doing wrong?

S Hazelgrave,
Leeds.

A Nothing. You've just come up against one of the less lovable features of the NEC. There are three ways to transfer data between RAM banks. You can use XFILES.CO, but that takes a lot of space.

You could use the BA (Bank Accessor) program which allows you to open files for input or output in two separate banks using BNKn: as a device prefix, *eg:*

OPEN "BNK1:filename" FOR INPUT AS #1
OPEN "BNK2:filename" FOR OUTPUT AS #2

You'd have to write a simple Basic program to transfer data — not difficult but again, the machine code gobbles a fair amount of RAM.

The most memory-efficient way is to use an external mass-storage device — cassette if you've got plenty of time and patience, larger micro with disk drives (via RS232) for speed and reliability.

Figuring this listing out is a fine art

Q Fine Art for the Spectrum, in *PCN* issue 97, was a very promising program, but after going through the listing for the umpteenth time and running the program all I get is '2, Variable not found:9520:2'. The program will only run if I delete line 9520.

The other problem I encountered was not being able to enter some of the program lines, *ie* PRINT#2;AT 0,0; statement on lines 550, 710,810,860 etc. These wouldn't enter without enclosing the £0 in colons, resulting in these objects appearing on screen in the program. Are they superfluous? The other puzzle is why I cannot enter into the listing lines 4090 and 4220 without omitting the vertical symbol just before POINT.

N D Reid,
London E10.

A 'Variable not found' means exactly what it says. You've got a variable in line 9520 that you haven't defined. As the error is in the second statement of the line it's READ j that's at fault, and the only way you can have a variable not found in this one is if you have a letter rather than a number in a DATA statement. Check through 9530 and 9540 and make sure they're all numbers.

Next problem. As far as most computers are concerned, pound signs and hash signs are interchangeable. The Spectrum is an exception, and unfortunately our printer was set to produce pound signs from hashes. Swap them round and you should have no problem.

Finally, the vertical bar — this was a consequence of a glitch in our printer interface, which gets glitchier as time goes by. Just miss them out.

Search for modem to match Amstrad

Q I am the proud owner of an Amstrad CPC 464 and am interested in connecting my computer into a modem but I am having trouble deciding which modem is the best for me. I don't want to pay more than £150.

What I want is 1200/75, 75/1200, 600, and 300/300 baud, with half or full duplex. An auto dial or auto answer option would also be great. I also need some software to run the system.

Damian Mullan,
Forest Gate, London.

A To run a modem on the Amstrad, you need three things — an RS232 interface, a modem, and some software to run the system.

There are a couple of interfaces available at the moment, one of which will be reviewed in the very near future in *PCN*. Made by RSX systems, it provides a complete RS232 with software to drive a printer and a terminal with baud rates from 50 to 19200.

RSX will be producing an updated version with VT100 emulation and file transfer capabilities in the near future.

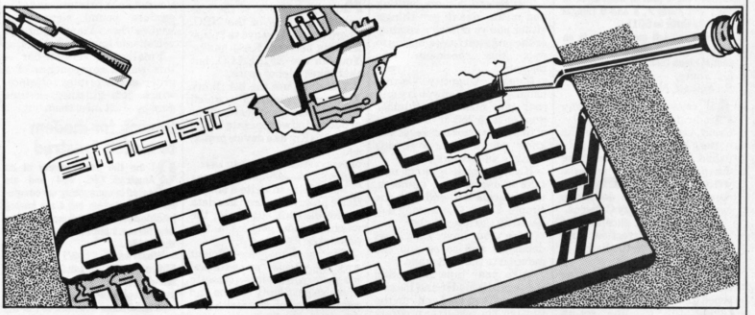
As far as modems go, there are any number to choose from, depending on how much you want to pay. The Minor Miracles WS2000 at £149.95, and the Pace Nightingale at £159.95 both meet your requirements.

Of course, if you are willing to wait a while, the Demon (formerly Unicom) modem may soon be available, with software, for less.

The only modem that is currently available for the Amstrad as such, is the Protek at about £90, including software and interface. Its drawback is that it runs at only 1200/75 baud.

CUE FOR ALTERNATIVES

Give your QL's word processing package added zing by speeding it up with Alan Turnbull's three routines.



Among the problems with QL Quill, the word processing package supplied by Psion for the QL, are lack of speed and the fact that the Microdrive 2 is used as a temporary 'scratch pad' for text which cannot currently be held in the QL's memory.

This anomaly arose from problems Psion had when writing Quill: the code is, quite simply, too bulky.

The applications software was developed in a high-level language — C — on a 'host' machine and then 'downloaded' onto the QL when Sinclair engineers had finalised the design. Unfortunately, this meant that the code ran very slowly for a code that had been written directly for the 'target' machine — in the QL's case, the Motorola MC68008 processor.

Added to the problems with Quill are the rumours that Microdrive 2 suffers as a poor relation to Microdrive 1 because of overheating from the heat-sink which sits directly behind it.

Early this year Psion is to release a major up-grade to Quill which, I hope, will be a lot faster, take up less valuable QL memory space and hence rely on Microdrive 2 less. But this doesn't help version one owners.

I hit upon the idea of making Quill use Microdrive 1 as the scratch pad — leaving Microdrive 2 for loading and saving archived documents as and when needed.

Using mdv1, rather than having the Quill program cartridge on mdv1 and your own data cartridge on mdv2, means that the cartridge in mdv2 may be changed at any time and as many times as you wish.

Unfortunately, this also means that all loads, saves, etc, default to mdv1 and you must specify mdv2 explicitly. This could be dangerous if you try to save a large document on mdv1.

The problem could be circumvented by changing only references to mdv2-def-doc to mdv1-def-doc rather than all occurrences of the string mdv2 to mdv1, but it would not really be worth the effort.

Even with large documents, mdv1 can cope because the scratch pad file never holds the whole of the current document.

The actual mechanics of altering Quill to use mdv1 (except for document storage) involve:

1 Taking the back-up version of the Quill cartridge and making a copy of the Quill machine code.

2 Examining this and replacing every occurrence of the string mdv2 with mdv1.

3 Deleting the help file, QUIL-HOB, from the cartridge to make room for the scratch pad file. (When you press function key F1, the help page option should be overlaid by Quill. Operating this option even when you have deleted the QUIL-HOB file will not crash Quill — it will simply tell you 'No help file on mdv1'.

4 Saving the modified Quill machine code — in a suitable format — back to the back-up cartridge.

Type in Listing 1, a very slow SuperBasic method of carrying out all the major tasks.

Listing 2 replaces the time critical searching operation by Motorola MC68008 machine code. When assembled, this routine converts into the list of bytes included as data in Listing 3 — the final version of the modifier program which will carry out all the necessary operations as in Listing 1, but much faster.

The final program in Listing 3 will modify the back-up cartridge holding version 1.03 of Quill so that it uses mdv1 as its scratch pad and not the unreliable mdv2. Note that if you have broken the 'write-protect' tab off your back-up Quill cartridge then you will not be able to carry out these modifications.

Remember, too, that version 1.03 of Quill is 61632 bytes long. It would be worth checking on the length of your version of Quill and altering the modifier program accordingly.

As a footnote, if you wish to connect floppy disk drives to the QL, as I am in the process of doing, you should be able to use this modifier program (suitably modified itself, of course) to make Quill recognise the new devices.

Listing 1

```
100 REMark          QL Quill Modifier Program
110 REMark COPYRIGHT (c) December 1984, Alan Turnbull
120 :
130 LET quill_code_length=61632
140 LET ascii_one=CODE('1')
150 LET mdv_two=65536*256*CODE('m')+65536*CODE('d')+256*CODE('v')+CODE('2')
160 LET reserved_address=RESPR(65536)
170 LBYTES MDV1_QUILL,reserved_address
180 FOR address=reserved_address TO reserved_address+quill_code_length-4
190   IF 65536*256*PEEK(address)+65536*PEEK(address+1)+256*PEEK(address+2)+PEEK(
address+3)=mdv_two THEN POKE address+3,ascii_one
200 END FOR address
210 DELETE MDV1_QUIL_HOB
220 DELETE MDV1_QUILL
230 SEXEC MDV1_QUILL,reserved_address,quill_code_length,0
```

Listing 2

```
00100 ; Motorola MC68008 Assembly Language version
00110 ; of the Quill modifier program.
00120 ;
00130 ; COPYRIGHT (c) December 1984, Alan Turnbull.
00140 ;
00150 ;
00160 ; Start address for search = A0
00170 ; Number of bytes to search = D1
00180 ;
00190 ; These values are passed in from SuperBASIC.
00200 ;
00210 ;
00220 AGAIN:      CMPI.B £'m',(A0)     ; Compare current 4 bytes with 'mdv2'
00230             BNE    NOT_FOUND     ; jump if not found here
00240             CMPI.B £'d',1(A0)    ;
00250             BNE    NOT_FOUND     ;
00260             CMPI.B £'v',2(A0)    ;
00270             BNE    NOT_FOUND     ;
00280             CMPI.B £'2',3(A0)    ;
00290             BNE    NOT_FOUND     ;
00300             MOVE.B £'1',3(A0)    ; Otherwise, replace '2' with '1'
00310 NOT_FOUND:  ADDQ.L £1,A0         ; Increment pointer to next byte
00320             DBRA   D1,AGAIN      ; Repeat until loop counter exhausted
00330             MOVEQ  £0,D0         ; Signal 'no error' to QDOS
00340             RTS                  ; Return to caller
```

Listing 3

```
100 REMark Final Version of the Quill Modifier Program
110 REMark COPYRIGHT (c) December 1984, Alan Turnbull
120 :
130 RESTORE
140 LET quill_code_length=61632
150 LET quill_code_start=RESPR(65536)
160 LET machine_code_start=RESPR(64)
170 LBYTES MDV1_QUILL,quill_code_start
180 LET machine_code_offset=0
190 REPeat read_data
200   IF EOF THEN EXIT read_data
210   READ data_byte
220   POKE machine_code_start+machine_code_offset,data_byte
230   LET machine_code_offset=machine_code_offset+1
240 END REPeat read_data
250 CALL machine_code_start,quill_code_length,0,0,0,0,0,0,quill_code_start
260 DELETE MDV1_QUIL_HOB
270 DELETE MDV1_QUILL
280 SEXEC MDV1_QUILL,quill_code_start,quill_code_length,0
290 :
300 DATA 12,16,0,109,102,30,12,40,0,100,0,1,102,22,12,40,0,118,0,2,102,14,12,40,
0,50,0,3,102,6,17,124,0,49,0,3,82,136,81,201,255,216,112,0,78,117
```

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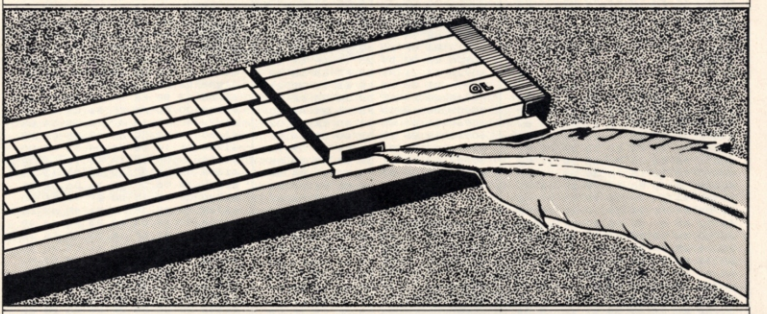
ASSEMBLY LINE

Does the thought of trying to decipher your machine code routines leave you bleary-eyed? Try AK Fox's time-saving routine which allows you to check all those ROM routines in your own programs.



Disassemble machine code into assembly language and make it easier to understand with this machine code routine. You will then be able to examine ROM routines and routines that you wish to use in your own programs.

It occupies only 1,440 bytes, 600 of which are data, and it saves you the tedious business of disassembling by hand.

Type in the loader program and save it. Now type in the hex loader and enter 60000 for the start address. Then enter the code, SAVE "DISS" CODE 60000,1439 after the loader on the tape and VERIFY it. Now type PRINT USR 60600 and the program will give you a prompt for the start address. If you make a mistake press P and try again, then press Enter and the disassembled memory will scroll up the screen.

The screen displays the address, the assembly language and also the hexadecimal codes. Press M to input another start address or the space key to return to Basic. Any other key continues the disassembly.

Mnemonics

All Z80 commands are recognised and jump relatives are calculated to the address that they jump to. For a starter, try disassembling ROM routines at 703 (key input), 16 (character print) and even the disassembler itself at 60600. The data contains just the first three sets of mnemonics shown in the manual because the index commands just mimic the HL register pair commands.

I have also split all the mnemonics into sets of 8. This way the routine uses bits 0,1,2,6 and 7 to direct it to the right set. Then bits 3,4 and 5 are examined to determine which registers or flags etc are used. Note that the printer buffer is used as a temporary store.

Loader Program

```
 10 POKE 23658,8
 20 INPUT "Start address";add
 30 INPUT "Enter code";a$
 40 IF INT (LEN a$/2)<>LEN a$/2
THEN PRINT "Error - try again":
GO TO 30
 50 LET a=CODE a$(1)-48-(7 AND
CODE a$(1)>58)
 60 LET b=CODE a$(2)-48-(7 AND
CODE a$(2)>58)
 70 POKE add,a*16+b
 80 LET add=add+1
 90 PRINT a$( TO 2);" ";
100 LET a$=a$(3 TO )
110 IF a$="" THEN GO TO 30
120 GO TO 50
```

Hex loader

```
 10 BORDER 7: PAPER 7: INK 0: C
LS
 20 PRINT AT 10,5; FLASH 1;"DIS
SASSEMBLER LOADING"
 30 LOAD ""CODE : CLS
 40 PRINT USR 60600
```

Listing

```
60000 FA CE 4F 50 C5 58 20 41
60008 46 2C 41 46 C4 4A 4E 5A
60016 20 13 87 13 87 4E 5A 2C
60024 13 87 5A 2C 13 87 4E 43
60032 2C 13 87 43 2C 13 FC 85
60040 0D 2C 12 C1 44 44 20 0F
60048 2C 0D FA 85 28 42 43 29
60056 2C 41 85 41 2C 28 42 43
60064 29 85 28 44 45 29 2C 41
60072 85 41 2C 28 44 45 29 85
60080 28 12 29 2C 0F 85 0F 2C
60088 28 12 29 85 28 12 29 2C
60096 41 85 41 2C 28 12 29 FC
60104 88 0D 89 0D FB 88 0A FB
60112 89 0A FB 85 0A 2C 13 FA
60120 D2 4C 43 41 D2 52 43 41
60128 D2 4C 41 D2 52 41 C4 41
60136 41 C3 50 4C D3 43 46 C3
60144 43 46 FD 85 0A 2C 0B FD
60152 80 0B FB D2 45 54 20 01
60160 FA D0 4F 50 20 0E D2 45
60168 54 D0 4F 50 20 0E C5 58
60176 58 D0 4F 50 20 0E 86 28
60184 0F 29 D0 4F 50 20 0E 85
60192 53 50 2C 0F FB 86 01 2C
60200 12 FA 86 12 80 CF 55 54
60208 20 28 13 29 2C 41 C9 4E
60216 20 41 2C 28 13 29 C5 58
60224 20 28 53 50 29 2C 0F C5
60232 58 20 44 45 2C 0F C4 49
60240 C5 49 FB C3 41 4C 4C 20
60248 01 2C 12 FC D0 55 53 48
60256 20 0E C3 41 4C 4C 20 12
60264 FB 80 13 FB D2 53 54 20
60272 11 FD 82 0B FD C2 49 54
60280 20 04 2C 0B FD D2 45 53
60288 20 04 2C 0B FD D3 45 54
60296 20 04 2C 0B FD FB C9 4E
60304 20 0A 2C 28 43 29 FB CF
60312 55 54 20 28 43 29 2C 0A
60320 FC D3 42 43 20 0F 2C 0B
60328 C1 44 43 20 0F 2C 0D FC
60336 85 28 12 29 2C 0D 85 0D
60344 2C 28 12 29 FB CE 45 47
60352 FC D2 45 54 4E D2 45 54
60360 49 FA C9 4D 20 30 80 C9
60368 4D 20 31 C9 4D 20 32 FA
60376 85 49 2C 41 85 52 2C 41
60384 85 41 2C 49 85 41 2C 52
60392 D2 52 44 D2 4C 44 FB CC
60400 44 03 FB C3 50 03 FB C9
60408 4E 03 FB CF 55 54 03 FA
60416 C1 44 44 20 41 2C C1 44
60424 43 20 41 2C D3 55 42 20
60432 D3 42 43 20 41 2C C1 4E
60440 44 20 D8 4F 52 20 CF 52
60448 20 C3 50 20 FA CE 5A DA
60456 CE 43 C3 D0 4F D0 45 D0
60464 CD FA D2 4C 43 20 D2 52
60472 43 20 D2 4C 20 D2 52 20
60480 D3 4C 41 20 D3 52 41 20
60488 80 D3 52 4C 20 FA 80 80
60496 80 80 C9 C4 C9 52 C4 52
```

Listing (cont)

```
60504 FA B0 B1 B2 B3 B4 B5 B6
60512 B7 FB CC 44 20 FB CA 50
60520 20 FB CA 52 20 FB C9 4E
60528 43 20 FB C4 45 43 20 FA
60536 C4 C3 C4 C5 CB CC A8 4B
60544 4C 29 C1 FB A8 49 59 2B 13
60552 13 29 FB A8 49 59 2B 13
60560 29 FA C2 43 C4 45 CB 4C
60568 D3 50 FA C2 43 C4 45 CB
60576 4C C1 46 FA CB 4C C9 58
60584 C9 59 FB CB 41 4C 54 FB
60592 00 00 00 00 00 00 00 00
60600 3E FF 32 8C 5C 21 AE EF
60608 06 40 3E 16 D7 3E 14 D7
60616 3E 00 D7 7E D7 23 10 FB
60624 21 00 5B 11 01 5B 01 19
60632 00 3E 00 77 ED B0 3E 0D
60640 D7 3E 0D D7 21 0E 5B 3E
60648 16 D7 3E 15 D7 3E 00 D7
60656 3E 3E D7 01 10 27 0B 78
60664 B1 20 FB E5 CD BF 02 E1
60672 FE 20 C8 FE 0D 28 21 FE
60680 50 28 C5 FE 30 38 E4 FE
60688 3A 30 E0 77 E5 21 0A 01
60696 11 64 00 CD B5 03 E1 7E
60704 D7 7E D6 30 77 23 18 CB
60712 E5 D7 3E 0D D7 E1 2B 7E
60720 32 18 5B 01 0A 00 CD 51
60728 ED 01 64 00 CD 51 ED 01
60736 E8 03 CD 51 ED 01 10 27
60744 CD 51 ED ED 4B 18 5B 18
60752 19 2B 7E E5 FE 16 00 D5
60760 E1 08 19 08 78 B1 20 FA
60768 ED 5B 18 5B 19 22 18 5B
60776 E1 C9 ED 5B 18 5B D5 D5
60784 C1 CD 2B 2D CD E3 2D D1
60792 3E 06 32 02 5B ED 53 1A
60800 5B 3E 16 D7 3E 15 D7 3E
60808 06 D7 CD FF ED 13 3A 05
60816 5B 83 5F 3E 00 8A 57 ED
60824 53 18 5B 21 00 5B 11 01
60832 5B 01 16 00 3E 00 77 ED
60840 B0 D5 CD C7 ED 3E 0D D7
60848 D1 CD BF 02 FE 20 C8 FE
60856 4D CA D0 EC FE FF 28 F1
60864 3E FF 32 8C 5C 18 A3 2A
60872 18 5B ED 5B 1A 5B D5 A7
60880 ED 52 45 E1 3E 16 D7 3E
60888 15 D7 3E 15 D7 7E CB 3F
60896 CB 3F CB 3F CB 3F C6 30
60904 FE 3A 38 02 C6 07 D7 7E
60912 E6 0F C6 30 FE 3A 38 02
60920 C6 07 D7 23 10 DF C9 1A
60928 13 21 71 EB FE CB 28 42
60936 21 8C EB FE ED 28 3B 21
60944 60 EA FE DD 28 23 FE FD
60952 28 1B 1B FE 76 21 AB EC
60960 CA B1 EE 21 60 EA 18 22
60968 1A E6 3B 32 00 5B 1A E6
60976 07 32 01 5B C9 3E 02 18
60984 02 3E 01 32 03 5B 1A FE
60992 CB 20 07 13 13 32 04 5B
61000 1B B7 CD 28 EE FE 00 20
61008 08 1A FE 40 30 03 32 06
61016 5B 1A E6 C0 47 CB 38 CB
61024 38 CB 38 3A 01 5B 80 47
61032 18 07 23 7E FE FA 38 FA
61040 05 7E FE FD 28 10 78 FE
61048 00 20 EF 7E FE FB 28 30
61056 FE FC 28 0C 18 12 78 FE
61064 08 38 25 D6 07 47 18 DA
61072 1A CB 5F 28 1B 04 18 0A
61080 3A 00 5B CB 3F CB 3F CB
61088 3F 47 23 7E FE 80 38 FA
61096 78 05 FE 00 20 F4 18 01
61104 23 7E FE 80 38 02 D6 80
61112 47 FE 14 30 7E E5 21 FF
61120 EB F5 CD 28 EE F1 FE 0A
61128 38 6B 3A 00 5B 4F 78 FE
61136 0B 20 0F 3A 01 5B CB 27
61144 CB 27 CB 27 32 00 5B 4F
61152 05 78 FE 0A 20 0A 79 FE
61160 30 20 4A 3A 03 5B 80 47
61168 FE 0D 20 0F 79 CB 3F E6
61176 38 FE 10 32 00 5B 20 35
61184 06 0F 78 FE 0E 20 0E 79
61192 CB 3F E6 38 FE 10 32 00
61200 5B 20 22 04 78 FE 0F 20
61208 0E 3A 03 5B CB 27 CB 27
61216 CB 27 32 00 5B 18 0E FE
61224 11 28 20 FE 12 28 27 FE
61232 13 28 38 18 00 CD 71 EE
61240 E1 18 08 7E FE 80 38 02
61248 D6 80 D7 23 7E FE 80 D0
61256 C3 B8 EE 3A 00 5B 4F 06
61264 00 CD A5 EF E1 C9 13 1A
61272 4F 13 1A 47 1B 1B 3A 05
61280 5B 3C 3C 32 05 5B CD A5
61288 EF 18 CD 3A 04 5B FE 00
61296 28 05 1B 1A 13 18 0A 3A
61304 05 5B 3C 32 05 5B 13 1A
61312 1B 06 00 4F 3A 06 5B FE
61320 00 28 15 D5 E1 79 FE 80
61328 38 09 3E FF 91 4F A7 ED
61336 42 18 02 09 23 23 44 4D
61344 CD A5 EF 18 93 D5 CD 2B
61352 2D CD E3 2D D1 C9 20 20
61360 20 20 20 20 44 49 53 41
61368 53 53 45 4D 42 4C 45 52
61376 20 31 39 38 35 20 20 20
61384 20 20 20 20 20 20 20 20
61392 20 20 20 20 20 20 20 62
61400 79 20 41 2E 46 4F 58 20
61408 20 20 20 20 20 20 20 20
61416 20 20 20 20 20 20 20 20
61424 20 20 20 20 20 20 20 20
61432 20 20 20 20 20 20 20 00
```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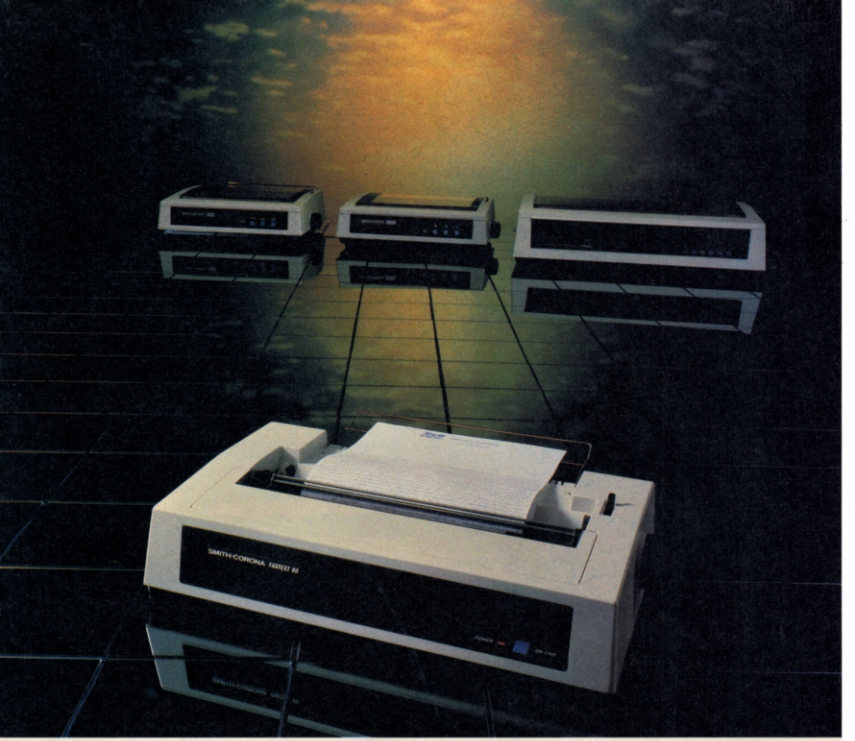

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BUZZ WORDS

Things will really start buzzing with this unusual game by Andy Clarke that could prove sticky.

What has six hairy legs, bulging eyes and dubious tastes in eating? You do, if you happen to have Buzzer 64 loaded up. For the Commodore 64, this game casts you as a fly in search of jam jars and sugar bowls.

It is played either with a joystick in port one or with the following keys:

Space — fire or swoop
Left arrow — down
1 — up
2 — right
Ctrl — left

You move around the screen avoiding the fly paper and the spray cans. If you're directly above a sugar bowl or jam jar (it doesn't matter how high) pressing fire allows you to swoop and score 100 points. Don't land or you'll lose a life.

You should also beware of the wasp, which tracks you remorselessly. You can outfly it, but it needs some skill. You're only safe at the bottom of the screen, but you need to come up to score.

When all your lives are gone you'll be given your score and the option to play again.

Program notes

1	Reads in sprite data. Gosub titles
2-3	Set sprite pointers
4-6	Set up the main variables
8	Checks if out of lives before starting
10	Clears screen and sets other variables
12-13	Print 'Score' and 'Lives' on screen
14-34	Set up the sprites for the game — colour, etc
50	Gets joystick input. If it is null then make the Buzzer flap wings so as to appear to hover
52	Comes here if joystick isn't null
58-64	Increase values of fly spray coordinates
70-72	Print Score and Lives only if they have changed — saves time
74	Checks if out of lives during game
76	Checks if Buzzer hits another sprite
80-84	Poke values into sprites and also into sound channels and fly paper colours
200-234	Title screen
500-518	Joystick routine. Move Buzzer by increasing/decreasing X or Y values and also check them to make sure they don't exceed screen limits
550-558	Swoop routine. Check if he hits a jam jar or sugar bowl
600-606	Choose either jam jar or sugar bowl and place at foot or screen in a randomly chosen place
700-762	Sound routines
800-820	End of game
30000-30079	Sprite data. Each separate sprite is marked. Four Buzzers are used

Listing

```
0 REM *** BY ANDREW CLARKE (C) 1984 **
1 FORS=200TO210:FORT=0TO62:READA:POKES*6
4+T,A:NEXTT,S:GOSUB200:CLR
2 POKE2041,200:POKE2042,200:POKE2046,208
:LF=5
3 POKE2043,201:POKE2044,201:POKE2047,210
:SC=0
4 TI$="000000"
5 BX=7:BY=7:DX=7:DY=7:GOSUB700
6 X1=100:X2=150:Y1=100:Y2=150
8 IFLF<=0THENPRINTCHR$(147)CHR$(5);"OUT
OF LIVES!!":GOSUB750:GOTO800
10 V=53248:PRINTCHR$(147):S=202:B=1:X3=5
0:Y3=70:POKEV+23,158:X4=45:Y4=230
12 PRINTCHR$(19)TAB(190)CHR$(144);"SCORE
:";PRINTCHR$(19)CHR$(5)TAB(229);SC
13 PRINTCHR$(19)TAB(30)CHR$(144);"LIVES:
";CHR$(5);LF
14 POKEV+39,11:POKEV+1,Y3:POKEV,X3:POKEV
+28,255
15 GOSUB600:IFD=2THENRETURN
16 POKEV+2,X1:POKEV+4,X2:Z1=5:Z2=210
17 POKEV+3,Y1:POKEV+5,Y2:Z3=1:GOSUB740
18 POKEV+6,100:POKEV+8,200:POKEV+42,1
19 POKEV+7,50:POKEV+9,50:POKEV+43,1
20 POKEV+11,229:POKEV+13,229
32 POKEV+37,1:POKEV+38,0:POKEV+41,6
34 POKEV+33,10:POKEV+40,2:POKEV+14,30
36 POKEV+45,0:POKEV+46,2:POKEV+15,206
38 POKEV+12,X4:POKEV+13,Y4:POKEV+21,255
50 POKEV+30,0:JS=PEEK(56321):IFJS=255THE
NPOKE2040,S:B=-B:S=S-B:GOTO58
52 CS=SC:FL=LF:GOSUB500:D=2
58 X1=X1+BX:IFX1>230ORX1<50THENBX=-BX
60 X2=X2-DX:IFX2>230ORX2<50THENDX=-DX
62 Y1=Y1-BY:IFY1>180ORY1<70THENBY=-BY
64 Y2=Y2+DY:IFY2>180ORY2<70THENDY=-DY
66 IFX4<X3ANDX4<250THENX4=X4+3:POKE2046,
208
67 IFX4>X3ANDX4>30THENX4=X4-3:POKE2046,2
09
68 IFY4>Y3THENY4=Y4-3
69 IFY4<Y3ANDY4<200THENY4=Y4+3
70 IFSC>CSTHENPRINTCHR$(19);TAB(229)CHR$
(5);SC
72 IFLF<FLTHENPRINTCHR$(19)TAB(30);"LIVE
S:";CHR$(5);LF
74 IFLF<=0THENPRINTCHR$(147)CHR$(5);"OUT
 OF LIVES!!":GOSUB750:GOTO800
76 IF(PEEK(V+30)AND1)=1THENLF=LF-1:PRINT
CHR$(147);"OUCH!!":D=0:GOSUB750:GOTO5
80 POKEV+1,Y3:POKEV,X3
82 POKEV+3,Y1:POKEV+5,Y2:POKEHF+7,X1/7:P
OKEHF+14,X2/7
84 POKEV+2,X1:POKEV+4,X2
86 POKEV+12,X4:POKEV+13,Y4
88 GOTO50
200 POKE53280,0:POKE53281,10
202 A$=CHR$(147):B$=CHR$(144)
204 C$=CHR$(5)
206 PRINTA$;C$;"          BUZZER 64"
208 PRINT"          ------ --"
210 PRINT:PRINT
212 PRINTB$"   GUIDE YOUR LITTLE";C$;" B
UZZER";B$;" AROUND"
214 PRINT" THE SCREEN,AVOIDING THE ";C$;
"FLY PAPERS";B$
216 PRINT" AND THE ";C$;"FLY SPRAY CANS.
"
218 PRINTB$
220 PRINT"   CAPTURE THE";C$;" SUGAR BOW
LS";B$;" AND ";C$;"JAM"
222 PRINT" JARS ";B$;"BY SWOOPING ONTO T
HEM FOR"
224 PRINTC$;" 100 POINTS!!"
226 PRINT:PRINTB$;"          JOYSTICK (PO
RT 1)"
228 PRINTB$;"    PRESS 'FIRE' TO SWOOP"
230 PRINT:PRINT:PRINTC$;"    PRESS
 FIRE NOW TO START"
232 IFPEEK(56321)<>239THEN232
234 RETURN
500 IFJS=247ANDX3<250THENX3=X3+8:S=202:P
OKE2040,S:B=1:RETURN
502 IFJS=251ANDX3>50THENX3=X3-8:S=204:PO
KE2040,S:B=1:RETURN
504 IFJS=254ANDY3>60THENY3=Y3-8:RETURN
506 IFJS=253ANDY3<230THENY3=Y3+8:RETURN
508 IFJS=250ANDX3>50ANDY3>60THENY3=Y3-8:
X3=X3-8:B=1:S=204:POKE2040,S:RETURN
510 IFJS=246ANDX3<250ANDY3>60THENY3=Y3-8
:X3=X3+8:B=1:S=202:POKE2040,S:RETURN
```

```
512 IFJS=245ANDX3<250ANDY3<230THENY3=Y3+
8:X3=X3+8:B=1:S=202:POKE2040,S:RETURN
514 IFJS=249ANDX3>50ANDY3<230THENY3=Y3+8
:X3=X3-8:B=1:S=204:POKE2040,S:RETURN
516 IFJS=239ANDY3<215THENFORG=Y3TO225STE
P2:POKEV+1,G:NEXT:GOTO550
518 RETURN
550 LK=PEEK(V+21)
554 IF(PEEK(V+30)AND32)=32THENPOKEV+21,2
23:GOSUB760:SC=SC+100:POKEV+1,Y3:GOSUB15
558 GOTO518
600 P=INT((250-70)*RND(1))+70
602 POKEV+10,P:POKEV+21,255
604 F=RND(1):IFF>.5THENPOKE2045,206:POKE
V+30,0:POKEV+44,7:RETURN
606 POKE2045,207:POKEV+30,0:POKEV+44,6:R
ETURN
700 FORC=54272TO54296:POKEC,0:NEXT
702 VO=54296:AT=54277:WA=54276:SU=54278
704 HF=54273:S=54272
706 POKEAT,32:POKEAT+7,32:POKEAT+14,32
708 POKESU,255:POKESU+7,255:POKESU+14,25
5
710 POKEVO,15:POKEWA,33:POKEWA+14,33:POK
EWA+7,33
740 POKES,160:RETURN
750 POKEWA,19:POKEHF+14,0:POKEHF+7,0:FOR
T=100TO0STEP-1:POKEHF,T
752 NEXT:POKEHF,0:RETURN
760 POKEWA,21:POKEWA+14,21:FORT=0TO200ST
EP3:POKEHF,T:POKEHF+14,T:NEXT
762 POKEHF,0:POKEHF+14,0:POKEHF+7,0:RETU
RN
800 POKEV+21,0:FORC=54272TO54296:POKEC,0
:NEXT:POKEV+33,10
802 PRINTCHR$(144)"YOU SCORED ";CHR$(5);
SC
804 PRINTCHR$(144)"PLUS ";CHR$(5);VAL(TI
$);CHR$(144);" FOR LASTING"
806 PRINTCHR$(5);TI$;CHR$(144);" SECONDS
":SC=SC+VAL(TI$)
808 PRINT:PRINT"A TOTAL SCORE OF ";CHR$(
5);SC
810 PRINT
812 PRINT"ANOTHER GO (Y/N)?"
814 GETA$:IFA$=""THEN814
816 IFA$="Y"THENGOSUB200:RUN2
818 IFA$<>"N"THEN814
820 PRINTCHR$(147);"BYE BYE":SYS64738
30000 REM***FLY SPRAY
30001 DATA0,21,0,0,37,0,0
30002 DATA21,0,0,12,0,0,63
30003 DATA0,0,255,192,2,170,160
30004 DATA2,170,160,2,170,160,2
30005 DATA166,160,2,149,160,2,102
30006 DATA96,2,89,96,2,149,160
30007 DATA2,153,160,2,166,160,2
30008 DATA106,96,2,153,160,2,166
30009 DATA160,2,153,160,2,106,96
30010 REM***FLY PAPER
30011 DATA0,32,0,0,32,0,0
30012 DATA32,0,0,32,0,0,32
30013 DATA0,0,32,0,10,170,128
30014 DATA10,248,128,8,190,128,8
30015 DATA47,128,10,11,128,11,130
30016 DATA128,11,224,128,10,248,128
30017 DATA8,190,128,8,47,128,10
30018 DATA11,128,11,130,128,11,224
30019 DATA128,10,248,128,10,170,128
30020 REM***FLY> WING^
30021 DATA0,0,0,80,0,0,21
30022 DATA0,0,21,64,0,5,80
30023 DATA0,1,80,2,9,84,10
30024 DATA42,86,40,170,170,164,170
30025 DATA170,168,186,235,168,58,235
30026 DATA32,240,195,0,3,207,0
30027 DATA0,0,0,0,0,0,0
30028 DATA0,0,0,0,0,0,0
30029 DATA0,0,0,0,0,0,0
30030 REM***FLY> WING V
30031 DATA0,0,0,0,0,0,0
30032 DATA0,0,0,0,0,0,0
30033 DATA0,0,0,2,10,40,10
30034 DATA42,86,40,169,86,164,169
30035 DATA90,168,181,91,168,21,107
30036 DATA32,213,195,0,83,207,0
30037 DATA0,0,0,0,0,0,0
30038 DATA0,0,0,0,0,0,0
30039 DATA0,0,0,0,0,0,0
30040 REM***FLY_ WING ^
30041 DATA0,0,0,0,5,0
30042 DATA0,84,0,1,84,0,5
30043 DATA80,128,5,64,160,21,96
30044 DATA40,149,168,26,170,170,42
30045 DATA170,170,42,235,174,8,235
30046 DATA172,0,195,15,0,243,192
30047 DATA0,0,0,0,0,0,0
30048 DATA0,0,0,0,0,0,0
30049 DATA0,0,0,0,0,0,0
30050 REM***FLY_ WING V
30051 DATA0,0,0,0,0,0,0
30052 DATA0,0,0,0,0,0,0
30053 DATA0,128,0,0,160,40,160
30054 DATA40,149,168,26,149,106,42
30055 DATA165,106,42,229,94,8,233
30056 DATA84,0,195,87,0,243,197
30057 DATA0,0,0,0,0,0,0
30058 DATA0,0,0,0,0,0,0
30059 DATA0,0,0,0,0,0,0
30060 REM***SUGAR BOWL
30061 DATA0,0,0,0,0,0,0
30062 DATA0,0,0,0,0,0,0
30063 DATA0,0,20,0,0,85,0
30064 DATA0,85,0,1,85,64,5
30065 DATA85,80,5,85,80,21,85
30066 DATA84,170,170,170,255,255,255
30067 DATA170,170,170,255,255,255,170
30068 DATA170,170,63,255,252,10,170
30069 DATA160,3,255,192,0,170,0
30070 REM***JAM JAR
30071 DATA5,85,80,5,85,80,42
30072 DATA170,168,175,255,250,191,85
30073 DATA254,189,170,126,182,150,158
30074 DATA182,85,158,182,85,158,182
30075 DATA165,158,182,85,158,182,85
30076 DATA158,182,150,158,189,170,126
30077 DATA191,85,254,191,255,254,175
30078 DATA255,250,47,255,248,43,255
30079 DATA232,10,255,160,2,170,128
40000 REM**** WASP 1
40001 DATA0,0,0,0,0,0,0
40002 DATA0,0,0,0,0,0,0
40003 DATA0,0,0,0,0,0,3
40004 DATA1,128,12,9,144,48,25
40005 DATA153,40,153,153,166,25,153
40006 DATA40,9,146,0,9,130,0
40007 DATA8,138,0,40,128,0,2
40008 DATA128,0,0,0,0,0,0
40009 DATA0,0,0,0,0,0,0
40010 REM**** WASP 2
40011 DATA0,0,0,0,0,0,0
40012 DATA0,0,0,0,0,0,0
40013 DATA0,0,0,0,192,0,0
40014 DATA48,2,64,12,6,96,40
40015 DATA102,100,154,102,102,40,102
40016 DATA100,0,134,96,0,130,96
40017 DATA0,162,32,0,2,40,0
40018 DATA2,128,0,0,0,0,0
40019 DATA0,0,0,0,0,0,0
40020 REM**** HAND 1
40021 DATA2,170,160,2,34,32,2
40022 DATA170,160,2,34,32,2,170
40023 DATA160,2,34,32,0,170,128
40024 DATA0,42,0,0,8,0,0
40025 DATA8,0,0,8,0,0,8
40026 DATA0,0,8,0,0,8,0
40027 DATA0,251,0,0,251,0,255
40028 DATA255,0,255,255,0,255,255
40029 DATA0,255,255,0,0,255,0
```

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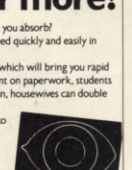

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Postcode:

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Post to HI-YIN Music, Dept. SR/PCN, 43 Church Hill Rd., OXFORD OX4 3SG.
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by Ray Davies

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BUSINESS-LIKE EXPANSION

Although expansion systems add valuable memory to your Spectrum they can cause difficulty with commercial programs.

Stuart Harris reveals how to run VU-CALC with the XK System.

Business programs with a modifiable Basic do not present too many problems in being converted to work with the extra memory made available by expansion systems, such as the Cambridge XK System (issue 91).

VU-CALC is one such program that not only converts to running with the extra memory, but allows data transfer between the spreadsheet pages without losing any features of the original.

To modify the Basic of VU-CALC to work with XK Expansion System enter MERGE "VU-CALC" and then list the program.

1 Remove LOAD "" SCREEN $: from line 10

2 Change line 1000 to read

```
1000 GOSUB VAL "1100": LOAD a$ CODE : CLS :
OUT 253,127: GO SUB VAL "1100": LOAD a$CODE :
CLS : OUT 253,126: GO TO VAL "3000"
```

3 Change line 3000 to read

```
3000 GOSUB 1200: PRINT AT 9,2;"ENTER 1 : EXIT
PROGRAM"''' TAB 9;"2 : CLEAR PAGE 1"''' TAB 9;"3 :
CLEAR PAGE 2"'' TAB 9;"4 : TURN TO PAGE 1"''' TAB
9;"5 : TURN TO PAGE 2': INPUT "OPTION? ";a
```

4 Change line 3010 to read

```
IF a >0 AND a < 6 THEN GO TO (3000+a*100)
```

5 Change line 3200 to 3350

6 ENTER 3200 OUT 253,126: GO TO VAL "3350"

7 ENTER 3300 OUT 253,127

8 ENTER 3400 OUT 253,126: GO TO USR VAL "25671"

9 ENTER 3500 OUT 253,127: GO TO USR VAL "25671"

Then enter SAVE "FILENAME", save to tape and verify the program.

Load the code from the original program entitled "c" and save it using SAVE "c" CODE 25232,5270 then verify it.

Finally, load the new version of VU-CALC with LOAD "FILENAME" RUN. After it has loaded, you will go straight to the spreadsheet like the original, except this is page 1 at OUT 253,126.

There is no need to keep the SCREEN $, as the time it takes to load this is best spent inputting the extra data into Page B. The same also applies to the two line basic program "vu-calc" before the main program.

Because of the way the XK Expansion System gives you an extra 32K RAM at the top end of the memory — from address 32768 up and the data loads into the spreadsheet from address 30457 — the top five rows of the spreadsheet and cells 1 to 27 inclusive on row F are common to both pages.

This area can be used for headings, allowing more room for figures in the lower 54 rows. More important, it can be used for transferring data between pages using the formula available in VU-CALC to move the figures around in conjunction with the #c (calculate) command *eg* to move the contents of AA1 on Page 1 to BA1 on page 2.

Move AA1 to F1 in the common area using the formula AA1 in box F1 then ENTER #c. Quit Page 1 using #q to call up the menu. Select option 5 to turn to Page 2 and with the formula BA1 in cell F1 enter #C and the contents of F1 will appear in BA1.

Cell F28 should be avoided when transferring data as part is in the common area and part is not. Note that any formula saved and reloaded on page 1 will be lost when page 2 is loaded.

Saving data is the same as in the original version.

These changes give a spreadsheet on each of the two internal pages provided by the XK System. More could be added — you are limited only by two things: the amount of memory left for the Basic part of VU-CALC and the number of sets of 32K RAM available to you.

If you wish to use the XK System with this expanded VU-CALC and a Microdrive then the Basic has to be radically altered (see Microdrive listing). Unfortunately, you lose the menu and the error trapping facility.

The loading of data into each page is done by going to that particular page using #q ENTER then entering 1 or 2 and loading from there.

Note that if you have any formula in the common area these should be loaded with the second page of data, otherwise they will be deleted.

If you should be returned to Basic you can get back into VU-CALC using GOTO 3000, and entering the page number required.

If you do not have the XK System yet, but still wish to use this listing to convert VU-CALC to work with Microdrive then delete lines 3000 — 3200 inclusive, and on being returned to Basic use GOTO USR 25671.

To save the Microdrive listing use SAVE *"m";1;"run" LINE 10. To save the machine code use SAVE*"m";1;"c" CODE 25232, 5270 after loading it from cassette. The program will load and run by entering run.

If you wish to save any data already on cassette to Microdrive use SAVE*"m";1;"FILENAME" CODE 30457,29469.

Tape Listing

```
 10 BORDER VAL "1": PAPER VAL "
1": INK VAL "1": CLEAR VAL "2523
1": LOAD ""CODE : GO TO VAL "320
0"
1000 GO SUB VAL "1100": LOAD a$C
ODE : CLS : OUT 253,127: GO SUB
VAL "1100": LOAD a$CODE : CLS :
OUT 253,126: GO TO VAL "3000"
1100 GO SUB VAL "1200": PRINT ''
'''ENTER data file name": INPUT
a$: RETURN
1200 PAPER VAL "7": INK VAL "0":
 BORDER VAL "1": CLS : PRINT TAB
 VAL "13";"VU-CALC": RETURN
2000 COPY : BORDER 1: GO TO USR
25674
3000 GO SUB 1200: PRINT AT 9,2;"
ENTER  1 : EXIT PROGRAM"''TAB 9;
"2 : CLEAR PAGE 1"''TAB 9;"3 : C
LEAR PAGE 2"''TAB 9;"4 : TURN TO
 PAGE 1"''TAB 9;"5 : TURN TO PAG
E 2": INPUT "OPTION? "; a
3010 IF a>0 AND a<6 THEN GO TO (
3000+a*100)
3020 GO TO 3000
3100 GO SUB 1200: STOP
3200 OUT 253,126: GO TO VAL "335
0"
3300 OUT 253,127
3350 CLEAR 25231: DIM b$(100): D
IM c$(20): GO SUB VAL "1200": GO
 TO USR VAL "25668"
3400 OUT 253,126: GO TO USR VAL
"25671"
3500 OUT 253,127: GO TO USR VAL
"25671"
4000 GO SUB 1100: SAVE a$CODE VA
L "30457",(PEEK VAL "30466"+256*
PEEK VAL "30467"-VAL "30457"+1): C
LS : GO TO USR VAL "25671"
5000 LET c$=STR$ VAL b$: GO TO U
SR VAL "30044"
9000 GO SUB 1200: PRINT ''''"ERR
OR was at"''"COLUMN "+PEEK VAL "
28784"+VAL "1"
9100 LET a=PEEK VAL "28785": LET
 b=INT (a/26): LET a=a-b*26: LET
 d$=CHR$ (b+64)+CHR$ (a+65): IF
b=0 THEN LET d$=d$(2 TO 2)
9200 PRINT "ROW     "id$: INPUT "
Press ENTER to continue"ib$: GO
TO USR VAL "25671"
```

Microdrive Listing

```
 10 BORDER VAL "1": CLEAR VAL "
25231": LOAD *"m"1;"c"CODE : GO
 TO VAL "3300"
1000 GO SUB VAL "1100": LOAD *"m
";1;a$CODE : CLS : GO TO USR VAL
 "25671"
1100 INPUT a$: RETURN
2000 COPY : GO TO USR VAL "25674
"
3000 INPUT a: CLS
3010 IF a>0 AND a<6 THEN GO TO (
3000+a*100)
3100 OUT 253,126: GO TO USR VAL
"25671"
3200 OUT 253,127: GO TO USR VAL
"25671"
3300 CLEAR VAL "25231": DIM b$(1
00): DIM c$(20): GO TO USR VAL "
25668"
4000 GO SUB VAL "1100": ERASE "m
";1;a$: SAVE *"m";1;a$CODE VAL "
30457",(PEEK VAL "30466"+256*PEE
K VAL "30467"-VAL "30457"): CLS
: GO TO USR VAL "25671"
5000 LET c$=STR$ VAL b$: GO TO U
SR VAL "30044"
```

DIALTEX FOR EPSON

Talbot's Dialtex 4 bears more than a passing resemblance to the Epson PX-8. An added extra is a built-in word processor that is just a little half-hearted, says Barry Thomas.

The keyboard on the PX-4 can be replaced by a dedicated type.

Inside the Dialtex 4 hides an Epson C/PM machine, fairly minimally disguised by having the word processing ROM of another company, Talbot Computers, built in. At first sight, it seems a little old fashioned: the micro cassette drive and the smallish screen are more reminiscent of Epson's HX-20 than one of the new breed of laphelds such as the Data General One.

Features

The cpu is a CMOS Z80 with a clock speed of 3.68 MHz. A 7508, 4-bit slave cpu controls keyboard input and such items as the power supply.

A dazzling array of physical features has been crammed onto the Dialtex. The keyboard's 72 keys include five function keys plus five more with the shift key. Next to these are four keys labelled Stop, Esc, Pause and Help/System. These are all calculator style keys with a slight click action. The other keys are full travel, full-size typewriter fashion.

The 40 character by 8-line liquid crystal display tilts about 35 degrees, after pressing a button at the back, but lacks some of the clarity of the NEC and Tandy models. However, a contrast control on the right side of the casing means most lighting situations can be catered for.

On the review model, to the right of the screen was a micro cassette drive with an eject button and two LEDs marked Free and Rec(ord). The standard machine comes with a dummy cartridge, which can be fitted with a circuit board, for specialised applications, by the user. This whole corner of the micro can be removed and replaced with a modem, RAM module or whatever else Talbot may dream up.

The cassette drive is accessed by the system as drive H:, so data and programs may be written to or read from the drive as if it were another RAM drive—except of course that access is sequential, not random.

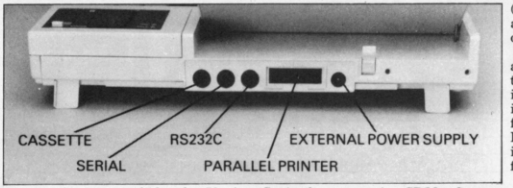
The right side of the casing features a tiny Reset button, recessed into the plastic. It's in a handy position, but could not be pressed by accident. Pressing it performs a warm reset, so if you are in the word processing program for instance, your current file would be lost, but the RAM contents would be safe.

Next to it is the thumbwheel which adjusts the contrast of the LCD screen. Then comes the power switch, followed by a jack socket where a bar code reader can be fitted as well as an external speaker socket.

The rear of the casing has two flip-up legs to make the typing angle just a little less flat. Grouped closely together are three mini DIN sockets; Cassette, Serial and RS232C. These are followed by a Centronics printer socket and the input for a mains adaptor. You'd need this after about 15-20 hours use. When power in the alkaline batteries becomes dangerously low, the screen clears and a 'charge battery' appears, and so long as the mains transformer is then plugged in, normal use can continue.

The left side of the machine looks bare,

The area where the cassette sits can be used for other add-ons.



but a plastic cover hides the 50 pin expansion bus. The full pin out of this port is given in the operating manual.

The base of the micro is also far from featureless. For a start there is a sliding catch and a finger grip for easy removal of the micro cassette drive. And then there are two flat, enticingly removable panels.

One allows access to an alkaline battery pack, which may be replaced with ordinary dry cells. The other panel lifts off to reveal three ROM sockets, protected by an aluminised card shield, a cold reset button and a set of dip switches.

The DIP switches alongside the ROM chips are used to assign the type of printer, the type of device operated by the LST: command and the type of keyboard in use. The standard keyboard is qwerty, but may be replaced with a calculator style version.

This optional keyboard, known as the Item keyboard, falls neatly into two banks of keys. All but one of the 32 keys in the left-hand set are user definable — the one exception is the Shift key. These may be configured to input different strings of characters when pressed, so that the computer may be used for specialised tasks. A set of overlays sits neatly behind a transparent keyboard surround on which the legends for each key can be printed. The right-hand bank of 23 keys contains the numerals, arithmetic functions and a Return key.

Documentation

The 265 page operating manual, stamped 'Preliminary', would shame many a micro manufacturer, such is the professional approach of Epson. Throughout, the computer is refered to as the PX-4, thus further betraying the parentage of the micro. An excellent first chapter puts the machine into its place in the Epson family of peripherals and outlines what CP/M is, with a list of commands. The following chapters are just as comprehensive apart from missing an index.

The Basic manual is equally impressive. All the commands available to this implementation of Microsoft Basic are listed with examples of their use within Basic programs.

In use

The screen display, at 40 characters by eight lines, is like a window on a larger screen of up to 50 lines of 80 characters. So, in theory, genuine CP/M software can run. The screen is not as easy as some to read, even with its adjustable angle and contrast.

A set of graphics commands includes PSET, PRESET, LINE and POINT. One feature of the graphics capability which differs from the less powerful laphelds is that graphics scroll with other information on the screen.

Other useful commands include CHAIN to load and run another Basic program without losing values of variables from the first; some disk handling commands and even a gorgeous little command called OPTION COUNTRY, where you can change the default character set from within Basic.

Lesser laphelds tend to have some form of text formatter built into the ROM, so to get the text out into a decent document form, a text outputter is needed. The Dialtex contains a ROM chip bearing a word processing program (Intext). Not only does it handle the text as it is input, but also as it is formatted out to a printer.

The built-in communications option allows you to access the RS232 port at up to 38, 400 baud. Not in the least bit slow, it works out at about 3.8K bytes of information per second. Any parameters for transmission can be set and saved to RAM as a default setting. Or they may be individually set up to the user's specifications.

Selection from the Intext menu is made with one keypress. E(dit) takes you straight into a blank document. The screen will be either a straight 40 × 8 line version, or the screen may be used as a window onto a screen of up to 80 × 50 lines; L(oad) loads a text file from the RAM disk into memory ready for editing; with P(rint) you can set the line length, page depth, bottom margins and so on, but a header or footer texts and dot commands are out. In fact, the word processor, the only part of the system contributed by Talbot Computers, is the weakest area. Customary features such as block insert and delete are allowed, but the major downfall is the outputting of test.

Verdict

If this sounds like your sort of micro, you will not be disappointed. However, if the word processor ROM is low on your list of priorities, remember you don't have to buy the machine from Talbot.

The Talbot Dialtex 4 appears at first sight to be a cut down version of the Epson PX-8 (right). Obviously the display on the Talbot is half the size, so some software will not work. Programs stored on micro cassette will load however, which allows you to transfer text from one machine to the other. Unfortunately, the utility ROMs are not compatible, so you can't use Intext on a PX-8. But, Basic programs can be swapped between the two machines without too many problems.

SPECIFICATIONS

Processor	Z80 main processor 7508 second processor
ROM	Operating system 32K Application ROMs 32K
RAM	64K
Operating system	CP/M
Software	Intext CP/M utilities
Price	£685
Distributor	Talbot Computers 0202-519282

BLOOD LUST

Fangs for the adventure, says Bob Chappell, as he surveys two new releases — Castle of Terror and Infidel, an atmosphere-charged archaeological adventure that will hold you in its grip.

Arch-fiend Count Dracula has bitten quite a few necks in his time and shows no sign of letting up on the blood-letting, at least where adventures are concerned. Here he comes again, in all his gory and turns you a whiter shade of pale, in Melbourne House's *Castle of Terror* (£9.95 Commodore 64).

There are about 40 graphical screens, some with animation, in this text and pics adventure. The game splits into two separately loadable parts (no mention of this was made in my early copy of the instructions), with some of the best pictures in the second half. Just wait till you enter the castle dungeons and come across remains of adventurers like yourself and you'll see what I mean.

Village idiom

The first half of the game has you strolling around the village where, by talking to the locals you learn that a beautiful maiden has disappeared. 'I say old carrot-cruncher, you don't mean to say that she's been kidnapped by C ...' 'Tis bad luck to speak his name round these parts, young zur.' That dialogue is not in the game but such is the nature of the theme, you can almost hear it.

In the village, locations include an old cottage, the Duck Inn (where 'Mine's a pint!' is an order worth noting), a graveyard and a mill. In particular, beware lookalike locations.

There's a good sprinkling of musical effects which add to the atmosphere. The puzzles are not too tough so the game is likely to appeal to the less experienced adventurer. An enjoyable Transylvanian trip.

Sand pitch

Adventures come and adventures go but, by the beard of my father's goat, any adventure from Infocom is an event worthy of proclamation by the trumpets of a thousand heralds. *Infidel* is no exception. The sands of Egypt beckoned as I went on an expedition in search of a famed tomb and riches beyond belief.

I woke up slowly, sat up in my bunk and looked around the tent. My head was pounding, I had a cottony taste in my mouth and my stomach ached — too much foreign spirit last night. The droning of a plane's engine broke the stillness, making me realise that things outside were rather quiet — too quiet.

For some days past, my workmen in this scorching desert had been complaining about the low pay, the lack of food and my incompetence in locating the pyramid. Making them work on a holy day was the last straw — they deserted while I lay in an alcoholic stupor.

The professor's map, full of hieroglyphics, seemed worse than useless without any navigational aid. All I could do now was pray I'd been left enough supplies to survive in this searing heat.

Desert pile

Infidel is another atmosphere-charged text adventure, well up to Infocom's standard. Take a look at this extract from the opening scene: *'Get out of cot.* You push yourself up and manage to get out of the cot. Your legs are a little wobbly, though, and your head swims. You hear a plane flying high overhead, outside the tent. *Leave tent.* You are on an east/west path on the north side of the encampment. To the south you can see a firepit and to the north is the entrance to your tent. Everything is oddly quiet, unsettling, creating a feeling of floating anxiety. The stillness seems to enhance the eerie quality of the desert, the feeling of being truly alone. There's an enlarged hole in the sand, a remnant of your excavation attempts. The plane seems to be circling right overhead.'

Visit the pyramids

You're in search of the famed pyramid of Ra with the help of an ancient, barely comprehensible map. As usual, the tale is full of detail and incident. First you must find supplies to keep you alive in the desert. Having located the pyramid, the next problem is finding a way in.

Once inside, you explore several different levels, each with its own set of difficulties. The main objective is to locate the burial chamber and uncover the sarcophagus supposed to be entombed there.

The game comes with plenty of background documentation, including a map — translating the hieroglyphics on it may well be worthwhile. You won't be surprised to learn that there's a mummy and sundry other unpleasantries lurking around.

Infidel doesn't have as many locations as some of Infocom's other adventures, and is probably a fraction easier, too. Nevertheless, all the expected features are present from full sentence input to detail-rich descriptions of incidents and places, touched with wit and humour.

A large vocabulary is one of Infocom's trademarks and in *Infidel* you'll find all the traditional verbs and a few more unusual ones such as compare, insert, wedge and sleep. Disk only, the game is available for a range of micros including the Commodore 64 and Atari.

May the jackals feast on my bones if you don't find *Infidel* to be another excellent piece of escapism.

Dungeonade

If you're starved for inspiration solving Infocom's *Deadline* here's food for thought. Drawing a blank with the notepad? THGI LOTP UTID LOHR OLIC NEPH TIWT IBUR. Don't know what to do with the desk calendar? ■ SEGE APEH TNRU T■ MIHW OLLO FNEH TNOO NRET FAEG ROEG OTTI WOHS.

New - the official Spectrum Upgrade!

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- Accepts all current Spectrum software and peripherals.
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Here's some exciting news for 48K Spectrum owners ... the official Spectrum Upgrade Kit.

The £20 Kit has everything you need to turn your Spectrum into the stylish new Spectrum +. You don't even need an understanding of electronics, just the ability to solder a few wires together! The leaflet in the kit gives clear, step by step instructions.

If you're not sure about doing it yourself, don't worry. Simply return your 48K Spectrum to Sinclair and for £30 we'll upgrade it for you.

Whichever you decide on, you'll also receive the new 80-page User Guide and Companion Cassette.

The bigger, better Spectrum keyboard

The Spectrum + measures 12½" x 6". It has a large typewriter-style keyboard, with hard, moulded keys.

You'll find the new keyboard has a smooth, positive action – ideal for touch-typing, word processing, simulation programs, and extended programming sessions. Two retractable legs give a perfect typing position.

There are 58 keys in all, including 17 new keys. Programmers will be pleased to see dedicated punctuation keys, a space bar, and separate shift keys for graphics and extended modes. And a reset button allows you to clear a program from your computer's memory without disconnecting the power supply.

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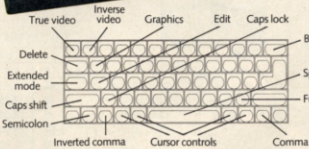

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```
10 MEMORY HIMEM-10
20 start=HIMEM+1
30 |ASSEMBLE,start
40 'get start
50 'limit &FFFF
60 'ORG start
70 'CP 10:SCF:RET Z
80 'RST 1,&B7F2
90 'ORG &BD2B
100'JP start
110'END
```

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DISK DANDY

The Amstrad grows up at last with the arrival of the DDI-1 disk system. And it's excellent value for money, says Bryan Skinner.

Amstrad's disk drive package (called DDI-1) is a steal: for just under £200 you get a 3in disk drive, CP/M 2.2, DR Logo and Basic extensions to allow you to use the disk as a fast tape system. You'd be lucky to get a disk drive and interface for that price for any other home micro you care to name.

The disks are 'flippy-floppies' — you turn them over to use the other side, giving each disk 340K of storage. The 3in format is also neat, you can literally chuck them across the room without damage and you don't have to be too careful about storage.

Getting started

Setting up is a doddle, as you might expect from a plug-in-and-go machine. Just plug in the ROM cartridge, connect the drive to the ribbon cable, fix a plug on the power cable and you're in business. Drives can be piggy-backed, for which Amstrad thoughtfully provides a second connector on the ribbon.

You can swap between tape and disk handling using the bar command extensions of the Basic operating system. Thus |tape switches to tape handling, |disc switches back to disk. From then on, all the tape-handling commands you're used to (except speed write, of course) will act on whichever device you've selected. Some commands require the @ parameter, as in |ERA, @A$ which deletes the file name contained in the string variable.

It's nice being able to switch into CP/M with just |CPM, and back to (almost) normal with AMSDOS. Because AMSDOS is designed to complement CP/M, CAT will produce almost the same as DIR *.*, *ie* display file names, their extensions and sizes, as well as the amount of free space left on disk. Many of the AMSDOS commands mimic CP/M commands, a neat touch because you don't have to switch into CP/M to rename files or switch user areas.

Documentation

There's only one manual and this covers just about everything from wiring the mains plug to Jump Block re-interception by the user, and all in less than 100 pages. Like the 464's manual, it is clear, well-written and detailed, but short on examples. There are sections on setting up 'turnkey' disks and installing CP/M software. The latter would be useful in the unlikely event of software distributors making CP/M programs available on Amstrad format disks, though with an RS232 interface you might be able to download software from another machine.

There are some fascinating snippets of information: 'The BIOS supports three different disk formats: SYSTEM format, DATA only format and IBM format.' Apparently, the IBM format is the same as that used on IBM PCs running CP/M and is intended for 'specialist use'. The plot thickens . . .

All formats have common parameters *eg* 512 bytes per physical sector and space for 64 directory entries. DATA only can be used if you never intend to use a disk with CP/M. It makes a little extra disk space available because no data is stored on the system tracks.

Where the manual falls down is in CP/M detail. For example, user areas are said to be 'for specialist use only, consult CP/M reference manual' — you have to buy that as an extra.

DR Logo is dealt with in 24 pages, detailing what each command does but there are no pictures. There are words like 'buttonp' and 'keyp' for monitoring joystick and keyboard, and sound commands (unique to this implementation) which follow the parameter passing pattern of Basic.

In use

The drive is slim but long. With the width of main unit of the Amstrad and the large monitor, the kit takes up a lot of desk space. There are dire warnings about putting the drive too near the left of the monitor.

The system is quite fast — reading in the digits 1 to 1000 takes about nine seconds using an integer FOR . . . NEXT loop. Writing the data to a file takes slightly longer because it has to be verified after each write operation. It's a joy to load whole screens of information and long programs in just a few seconds.

However, it's a crying shame random access files aren't supported. Data files under Basic/AMSDOS are sequential. This means if you want to write a database in Basic you're going to come across a lot of problems. To read in the Nth entry, you'll have to read in all preceeding N-1 entries first. Sequential files also mean that inserting an entry, or sorting and rewriting entries will be a real pain (and slow). And if the file size exceeds available RAM, you simply won't be able to.

Verdict

The DDI-1 takes the Amstrad out of the home computer category and into the bottom end of serious use. With a printer, and when suitable software becomes available, it will be quite feasible to run accounting packages, stock management systems, and do all the word processing required of a small business.

For the home user, the addition of the DDI-1 means users can get acquainted with the grandaddy of operating systems, making the transition to 'real' micros much easier. Amstrad is to be congratulated for using the 3in format, bundling CP/M and in particular keeping the price low. A bargain.

The long-awaited Amstrad disk drive, with its interface.

REPORT CARD: 1 TO 5

Features	●●●●●
Documentation	●●●
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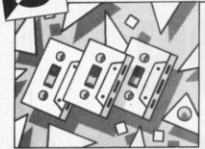

We check out the latest contenders on the software market, and cast an eye to the future. Don't forget, if you want your company's package to be included on this page, send your latest releases to Bryan Skinner, *PCN*, 62 Oxford Street, London W1A 2HG, along with prices and 'phone numbers.

AMSTRAD

The Amstrad's been crying out for a decent flight simulator since its launch. This week saw three releases with a strong aerial theme, but none of them quite make the grade.

Flight Simulation is the poorest of the crew. It's written in Basic — not a good idea because that makes the controls sluggish and the screen updates rather slow. You can pilot any of 15 aircraft types.

With its simple wire frame landmarks it's a fair attempt, but certainly not worth £11.95.

At the other extreme is *Dark Star*, Design Design's conversion of its Spectrum hit. Very much an arcade type game, you command the vessel Liar as it hurtles through a colourful, if simple, landscape.

In space you can search for planets, then on the surface toggle your tactical map in your search for enemy bases. Enemy forces are defended by anti-aircraft emplacements on towers, so you have to dodge, fire and weave, keeping a close eye on your energy levels.

Fighter Pilot is, again, more an arcade game than a flight simulator. But it's easily the best of this bunch.

It's very fast, difficult and the screen display is excellent. You're in control of a jet fighter, can toggle a flight map to help track the delta winged enemy craft (they fire back at you if you let them slip past), and use your flight computer to match altitudes and bearings. Well worth £8.95.

Angelique — a Grief Encounter is the full title of the latest in the Arnold Blackwood series of adventures from Nemesis. Arnold, Wilhelmina and Angelique, the three most valued agents of Lord Erebus, have crashed in a light aircraft. With Wilhelmina dead and Arnold's fate unknown, Angelique must make her way from the heart of an extinct volcano to Raffles.

Flight Simulation	**£11.95**	**Myrddin 0793-40661**
Dark Star	**£7.95**	**Design Design 061-205 6603**
Fighter Pilot	**£8.95**	**Digital integration 027-684959**
Angelique	**£6.50**	**Nemesis 0933-623967**
Basic Tutorial 2	**£19.95**	**Amsoft 0277-230222**
Osprey	**£8.95**	**Amsoft 0277-230222**

BBC

Durell has now converted its excellent *Combat Lynx* for the BBC and Electron. It's a military helicopter simulation; your brief as pilot is to keep your forces supplied and to collect the wounded for hospitalisation. The BBC version doesn't include enemy lorries or helicopters, but it's still a very good game.

Orpheus is a seven-screen arcade affair. The hero has to fight his way across a raging torrent to collect five golden harps. As you progress life gets harder — the river gets rougher and obstacles abound.

Naturally, the harp guardians don't take kindly to your activities and may need warding off with your handy discus.

Combat Lynx	**£8.95**	**Durell 0823-54489**
Arabian Nights	**£6.99**	**Interceptor 07356-71145**
Orpheus	**£6.90**	**A&F 0706-341111**
The Joffe Plan	**£9.95**	**Mirrorsoft 01-822 3947**

COMMODORE 16

Anirog hasn't been slow to convert many of its Commodore 64 titles for the C16. But this week's list includes a new game, *3D Time Trek*, a Star Trek derivation.

Gremlin's *Xargon Wars* is a fairly standard shoot-'em-up with 16 screens and multi-level difficulty.

Commodore has released four titles for its machine. There's nothing new here, a shoot-'em-up, a city bomber, submarine patrol and a curious sort of pinball/golf game.

Most notable is *Jack Attack*. It's on cartridge, hence the price. Jack, we are told, is an aggressive little creature with big feet and wiggly antennae. You make him squash spinning ballons by jumping or flattening them with blocks.

Xargon Wars	**£6.95**	**Gremlin 0742-753423**
3D Time Trek	**£6.95**	**Anirog 0322-92513**
Minipedes	**£6.95**	**Anirog 0322-92513**
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Jack Attack	**£14.99**	**Commodore 0536-205252**
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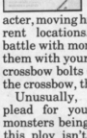
COMMODORE 64



Shades is a graphics adventure of the new type — like *Tir Na Nog*, (on the Spectrum) you control a character, moving him around different locations. You can do battle with monsters, stabbing them with your sword or firing crossbow bolts (if you've found the crossbow, that is).

Unusually, you can also plead for your life, though monsters being what they are this ploy isn't guaranteed to work. The game looks nice, but plays badly — reponse to the joystick is poor and movement is slow. A disappointment.

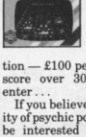
Aqua Racer is an aquatic *Pole Position*. You charge around one of 20 circuits in an inflatable. There are two gears and acceleration and turning need a joystick. To qualify you must complete a circuit within the time limit, but there is a practice mode which you'll need to get started.

It's fast and quite tricky, but is badly let down by a lack of variety, poor sound and rather simple graphics.

Hypercircuit is also a let-down. It's a maze-type game, the scenario being a PCB invaded by malevolent molecules. The sound's good, but the game's very limited.

Shades	**£8.95**	**Durell 0823-54029**
Aqua Racer	**£6.99**	**Bubble Bus 0732-355962**
Hypercircuit	**£7.95**	**Alligata 0742-755796**

SPECTRUM



Moon Cresta is the 'official' micro version of Nichibutsu's popular arcade game. There's to be a high-score competition — £100 per month — just score over 30,000 points to enter . . .

If you believe in the possibility of psychic powers you might be interested in *Know Your Own Psi-Q*. The manual states: 'research has shown that practice improves psi-ability', and the program offers four tests for this purpose.

If, on the other hand you're of a more cynical mind, you'll have divined that controlled experiments into parapsychology have yet to show any repeatable positive results and that programs like this ought to appear as free listings. Certainly not worth a tenner.

Psi-Q	**£9.95**	**Mirrorsoft 01-822 3947**
Moon Cresta	**£6.95**	**Incentive 0734-591678**
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COMMODORE 64

ARCHON

STAR GAME

Archon received rave reviews in the US when it was launched last year, and it's not hard to see why. Don't be put off by it superficial resemblance to chess. It's similar, but the differences ensure it will appeal to a much wider audience.

You can compete against another player or the computer. As the computer plays a really mean game I don't advise this, at least not when you're starting — it's depressing getting hammered so quickly.

The battlefield is a nine by nine matrix of dark and light squares, but the pattern's not as regular as a chess board. There are five 'power points' and the aim of the game is to occupy all these, or vanquish the enemy.

The major difference between *Archon* and chess is the pieces. Each side has 18 and there are eight different types of player in each team — but the pieces on one side are not the same as those on the other. The light side has Unicorns, Archers and Golems, while the dark has a Shapeshifter, Dragon, and the Basilisk.

The 16 page manual details the characteristics of each type of piece, so you can judge whether it's worth pitting one of your Archers against a Basilisk (it usually isn't).

To move a piece (or icon as they're called), you put the yellow square over it and press fire. One minor annoyance is that once you've selected a piece you can't change your mind. However, move the piece to the square you want it to occupy, and press fire again. The yellow square stays put, marking your original position until you're done and, of course, each piece has a different range.

Moving a piece onto a square occupied by the opposing force means you're willing to do battle, and this is where the game comes into its own.

The chosen square expands to fill the screen, and you battle it out against the enemy in true shoot-em-down style. That is, if your piece can fire.

The Pheonix, as you might expect, can turn into a blazing fireball, so attacking with this requires not a little skill as you dodge behind obstructions, waiting for a chance to catch your opponent in the flare. At each side of the screen coloured columns indicate the relative strengths of the duelling pair.

The lynchpins of the two forces are the Wizard and the Sorceress. These occupy the rear central squares and can cast spells to affect play. You can heal wounded pieces, revive a dead piece, summon an elemental to fight an enemy piece in any square and much more.

It takes a long time to work out the sort of strategies you need to play well; this is not an easy game. There is so much detail that the documentation includes two pages on questions and answers to some common problems as well as hints and tips on strategies. You'll have to discover the Luminosity Cycle, attack intervals, or Shift Time for yourself.

Archon is brilliant. There's something in it for all games addicts; arcade, adventure and strategy are all here. My only complaint is that it's best played against a human opponent — the computer's just too good and you can't give it a handicap.

Bryan Skinner

Price £11.95 **Publisher** Ariolasoft 01-834 8507

COMMODORE 64

BATTLE THROUGH TIME

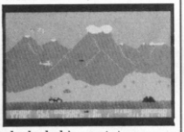
Ringing the changes on the Moon Buggy theme comes this motorised romp through seven periods of time.

Each stage has a similar setting of fixed mountainous or volcanic background, and fast-scrolling bumpy foreground. Bouncing niftily across the terrain comes your vehicle, a well-suspensioned buggy which moves forwards, backwards or upwards.

The buggy fires upwards and forwards simultaneously — handy for blasting the occasional boulder, volcanic debris or foot soldier, or assorted aerial attackers,

The idea is to travel ten miles (within a fixed time limit) through each of seven periods in history. Stage 1 is World War 1 with biplanes bombing your hubcaps off. Hit a plane and it dives vertically — hit it again and it explodes in a red flash. The bombs can be dodged or shot down.

Later screens take you forward in time against bombers, jets, helicopters, satellites and mutant boxes and mutant hands (the author's imagination clearly collapsed after World War III). Looks like it



also had a hiccup at stage seven since you go back to prehistoric times. Never mind the chronology, feel the fun.

Options include one or two players, two skill and speed levels and starting a game from where the last one ended. Beethoven's Fifth and a variety of musical snatches burble merrily throughout. They're good but you can suppress them.

A fun variant of a popular breed of game, nicely implemented and venomously addictive.

Bob Chappell

Rating 8/10
Price £7.95
Publisher Anirog 0322-92513

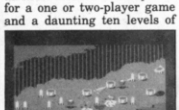
COMMODORE 64

3D SKRAMBLE

Live Wire is perhaps best known for bringing us the first three-dimensional *Frogger*. Its latest all-action arcade game is a similar blend of the old and the new.

Skramble, where you pilot a fighter craft through a series of tortuous subterranean tunnels, has been around for some time. Live Wire has now placed it in a 3D setting.

As with other games from this company, the presentation, graphics and use of sound are all first rate. There are options for a one or two-player game and a daunting ten levels of



skill to choose from. There's also a music suppression and a freeze-game facility.

Your space craft must fly through six battle stages, each a long diagonally scrolling screen filled with ground-to-air-missiles and fuel dumps. Yes, you still have to bomb the dumps to replenish your fuel supply.

If you survive the missiles and don't crash, you'll face flying saucers and the dreaded fireballs, before reaching your target, the power complex. Points are scored for knocking out ground or airborne rockets, astrobases, fuel dumps and flying saucers, with an extra life (you have three to start) at 10,000 points.

Getting used to the extra dimension take a little practice. Your craft can bank left and right, elevate and descend. Bombs and rockets are fired simultaneously by pressing the fire button.

The game plays furiously and offers a thumping good challenge. I loved every minute of it — but then I'm a *Skramble* addict.

Bob Chappell

Rating 9/10
Price £7.95
Publisher Live Wire 061-834 4233

COMMODORE 64

CAVERNS OF SILLAHC

Another of those games with a pageful of waffle along the lines of 'It was chronicled in the ancient books of . . .' and few instructions.

The game looked more promising, involving taking a spacecraft through a network of underground caverns in order to rescue various droids. The bottom half of the screen contains information about fuel, dwindling lives, dead and live droids, while the action is confined to the top half.

The game needs a joystick, and as you take off from the planet's surface goldfish appear to be swimming above you, though I think it's safe to assume these are in fact bombs of some kind.

They're to be avoided, anyway, as are the larger spherical objects that patrol parts of the screen.

The game takes forever, and as it doesn't involve any great skill once you've blasted the goldfish out of the skies it is also exceedingly boring.

Mike Gerrard

Rating 4/10
Price £7
Publisher Interceptor Software 07356-71145

GAMEPLAY

SPECTRUM

HELLFIRE

Return to the days of brave Ulysses and do battle with the Gorgon and the Minotaur in this three-in-one arcade game from Melbourne House, which should know all about the classics, after publishing some of them.

This isn't quite in that league, and has good points and glaring faults — for instance, you're not told it's compatible with Kempston and Interface II till it's loaded, which makes for some confusion.

There's also no pause facility or wait between games, and as you're required to do different things with different controls on each of the three screens you find yourself initially losing lives while scrabbling to find the cassette cover for instructions.

Screen one is a Greek *Donkey Kong* — bound up the slopes of Mount Olympus and avoid falling boulders. You leap from ledge to ledge heading for a cave at top right, and once you've worked out the route it's none too difficult, provided you judge just where to take off from before you leap.

It's eerily silent, too, like all three screens, the second of which counts as a pretty silly game. You make your way from bottom left to top right by running behind pillars. Go behind one from the left and you emerge on the right-hand side of a different pillar, so your aim is to discover which left-hand pillar brings you out from behind the pillar next to the exit.

You can bounce between floors thanks to an ancient Greek trampoline at one side of the screen, and must also avoid the Minotaur on the bottom level. Take too long and another appears.

Naturally each screen is harder as you go round and round through the game.

The third screen is toughest, an *Ant Attack* style maze where you mash monsters with your mace and search for the exit. I soon found the first two screens tedious, and wished I could start on this one each time. Good graphics on all three, but this one's definitely not a Melbourne House classic.

Mike Gerrard

Rating 6/10
Price £6.95
Publisher Melbourne House 0253-535001

COMMODORE 64

SHOOT THE RAPIDS

The phrase 'career prospects' took on a new meaning when I started this canoeing simulation.

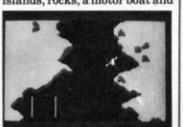
Although the idea is to navigate a frail canoe down a fast-flowing stretch of river, I spent most of my time careering from bank to bank. Going through the starting gate sideways does nothing to inspire confidence in one's ability to pass through the more awkwardly placed gates on the course.

The view is aerial and the downwards scrolling scenery is river and banks. Skilful waggling of the joystick (or two-fingered key-tapping) controls the movements of the canoe paddle.

The current runs strongest in the centre of the river, so it's tempting to stay there. The trouble is, it's all too easy to go flashing past one of the gates, thereby suffering a penalty.

Although you're going against the clock, heavy time penalties are accumulated for missing gates or denting one of the pointed ends of your canoe. Smack the side against the bank and you're for the early bath.

Finishing the course within the qualifying time gains you entrance to the harder levels, where added hazards include islands, rocks, a motor boat and



a mischievous beaver. You only get one life so you're sunk if you sink.

The graphics are fairly simple (there's not much you can do with a wide stretch of river) but the scrolling is very smooth. There is optional music but it doesn't soothe. Controlling the canoe is what this one's all about.

Shoot the Rapids is well done, no question, but there isn't enough to keep you coming back for more.

It also lacks that certain pizzazz — the river coursed but my adrenalin didn't.

Bob Chappell

Rating 7/10
Price £7.95
Publisher New Generation Software 0275-884752

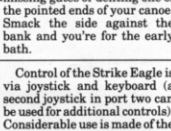
COMMODORE 64

F15 STRIKE EAGLE

Don't be fooled — if you're looking for fast and furious on-screen action, this game isn't it.

It could best be described as a wartime flight simulator, full of technical detail and theoretical tactics, but short on thrills. The F15 Strike Eagle of the title is armed to the teeth with 1000 rounds of air gun ammo, 8 heat seeking and radar homing missiles and 18 bombs — what more could any computerised megalomaniac ask for?

Control of the Strike Eagle is via joystick and keyboard (a second joystick in port two can be used for additional controls). Considerable use is made of the



keyboard to switch armament modes from airguns to missiles or bombs.

On the screen is the essential view of the horizon through the cockpit window of the Strike Eagle, the ground in brown and sea of blue. Additional on-screen data includes a map of your current mission, a graphical interpretation of the plane's armament capability and a radar screen which provides lots of red herrings.

The simulation is naturally full of options. There are four skill levels and a choice of seven different missions to fly, all of which are based on actual air combat missions — ranging from Libya in August 1981 through Syria in March 1984 and Iraq in June 1981.

A briefing is provided on each mission. This describes the situation, the flight plan and the enemy threat. Study it all well, as the simulation improves considerably with familiarity — and it needs to, because it's hellishly slow to begin with. Take heed of a passing comment of a casual observer while the game was being reviewed: "Bit slow isn't it?" You betcha.

Keith Mason

Rating 7/10
Price £9.95
Publisher US Gold 021-359 3020

COMMODORE 64

INDIANA JONES IN THE LOST KINGDOM

How's your IJQ? It won't get you into Mensa but if your Indiana Jones quotient is high, you may just be bright enough to solve this game of graphic problems and puzzles.

There you are, complete with familiar hat, bullwhip and not-so-familiar walking stick, about to enter the castle in search of the lost artifact. Six doors confront you, each leading to a room with three doors.

The six doors represent the screen selected, the three doors the difficulty level. Once you've begun, pressing Return restarts the game and avoids the earlier rigmarole by letting you type in the desired screen and level number.

The screens are all different but in general are a mixture of caverns, cliffs, platforms, numbers, poles and lifts. There are a number of hazards including bats, an impressive hydra, large birds, giant snowflakes and bouncing balls.

Although you can tackle the screens in any order, you must complete them serially in order to succeed at the game. Each screen has its own unique set of puzzles. Solving them helps you find the way out to the next

screen. The difficulty level appears to change the number, speed and characteristics of the dangers.

Indy is an effectively animated character. In some screens, he can produce a walking stick with which he can ward off any attackers and put to other good uses do help you solve the puzzles.

The graphics and sound are of a good standard. The game requires logic, quick reflexes and the patience to try out everything. Worth a play in my view.

Bob Chappell

Rating 7/10
Price £9.50
Publisher US Gold 021-359 3020

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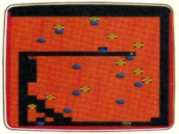

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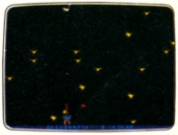

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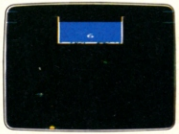

013 Arcade BBC MICRO B
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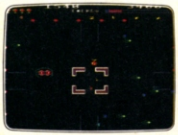
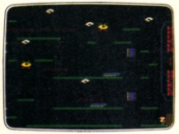


022 Arcade BBC MICRO B
ESTRA – Recover the sacred statue of Estra the snake god.



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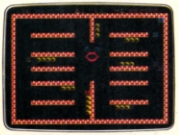
010 Arcade SPECTRUM 16K/48K
MENACE – What happens when teacher turns his back.



021 Arcade SPECTRUM 16K/48K
CRAZY CAVERNS – Ten crazy caverns, ten hungry mouths to feed.

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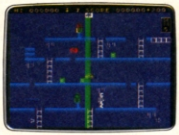

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ELECTRIC OFFICE

For a reasonably priced integrated package, Electric Desk features all you'd want

And, says Geof Wheelwright, home or small business users will find it easy to understand.

Integrated software is what everybody would like, but they don't want the hole in the bank balance that comes with it. However, they might think seriously about *Electric Desk*, an IBM integrated software system for under £400.

Features

Electric Desk includes a database, word processor, spreadsheet and communications package. The application conspicuous by its absence is a business graphics system (which manufacturer Alpha considered an unnecessary luxury). Within each application you can open up as many 'services' as the memory of your machine can hold. (A service is a spreadsheet, document, database file or communications set-up).

Because all your work is held in memory, you can swap from one service to another with just a few key strokes.

There are no 'windows' in the conventional sense, although a split screen serves much the same purpose (Alpha Software says it can't see the usefulness of more than two windows, *ie* you can't concentrate on more than two things at once).

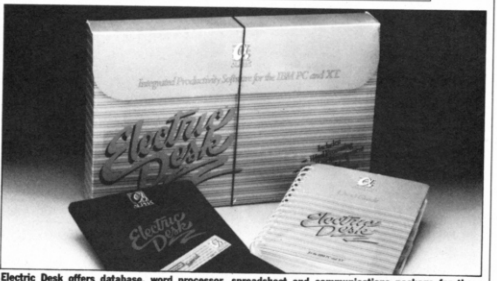
One area where this split-screen approach beats the more conventional windowing is in help menus. *Electric Desk*'s split-screen context-sensitive help facility gets round the problem with most help menus — even context-sensitive ones — *ie* that you must write down or remember what the help menu says.

Documentation

The documentation could be seen either as pleasantly simple or disappointingly inadequate. It consists of a single manual, slightly thinner than the BBC Micro User Guide, and bound in the same spiral-wire fashion.

The manual is separated by tabbed dividers into sections on each package within the system and a chapter dealing with the overall work environment. All you need to know for most common tasks with each package is included, provided you're not trying to establish a huge, complex database or a particularly tricky spreadsheet. There are 45 pages devoted to the word processor, 69 to the database, 60 to the spreadsheet, but a mere 18 set aside for the communications service. Much of it covers US communications systems that are largely irrelevant to UK users.

As with most low-priced integrated packages, *Electric Desk* is pretty easy to use and most of the applications can be operated without even so much as a passing look at the manual.



Electric Desk offers database, word processor, spreadsheet and communications package for the reasonable sum of £328.

In use

The word processor is a simple full-screen type with on-screen automatic reformatting of text, reminder menus at the top of the screen and a line showing tabs and statistics at the bottom.

On-screen underlining, bold, italics and roman typefaces are supported, margins can be changed easily and pasting and cutting is simple. All this is menu-driven. There are no macros or embedded formatting directly from the keyboard. To embed a command, you must select the embedded commands option from the menu by hitting the F-8 document commands key.

Most other functions in the word processor are menu-driven. For a beginner, it's probably a blessing, as it avoids having to learn lots of key commands right off.

The word processor also scores on its print-spooling facility, which works quickly and effectively. With most print-spooling mechanisms in integrated packages, the type ahead buffer slows right down and the machine keeps having to jump between the disk, the keyboard and the screen in its I/O handling. However, I found the packages kept up quite easily with my typing speed.

The database application is the most complicated in the package. From the limited time I had to look at the database, it seemed quite complete, but possibly not as friendly as the other three.

Electric Desk's spreadsheet has all the functions you'd expect, with one odd difference; rows and columns are both accessed by number. So, instead of the spreadsheet starting at A1, it starts at a cell reference called R1C1 (Row 1, Column 1).

This is relatively easy to get used to, however, and the spreadsheet is otherwise menu-driven and as easy to use as the word processor.

The communications package supports all the common baud rates and was successfully used with Prestel (300/300 service), One-to-One and transferring information between micros. The menu-driven approach helped again and made the application usable without even so much as a glance at the manual.

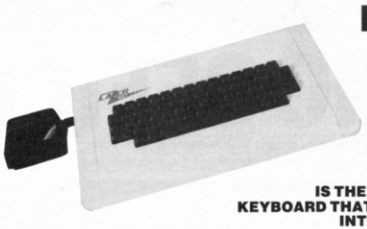
Verdict

Electric Desk is a good all-round easy-to-use integrated package for about half the price of most integrated software suites. It may lack the fancy graphics features of *Symphony* or *Framework*, but it isn't anywhere near as memory-hungry and runs without a memory expansion card. For serious home users, small offices and professionals, *Electric Desk* can be considered something of a bargain.

REPORT CARD: 1 TO 5

Features	●●●●●
Documentation	●●●
Performance	●●●●
Overall value	●●●●

Name Electric Desk **Price** £327.75 **Application** Integrated Software System IBM PC, PCjr or compatible (+256K RAM) **Other versions** None **Outlets** First Software, Intec-1, Wade Road, Basingstoke, Hants RE24 0NE (0256-463344).



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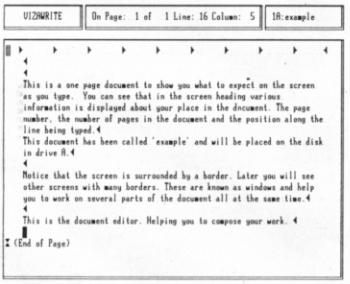

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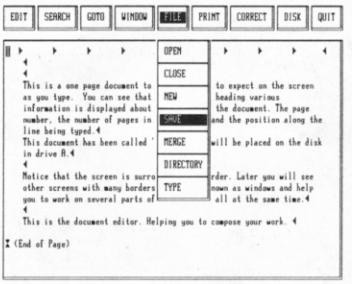

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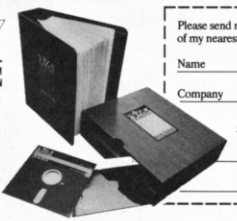

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Amstrad wanted. Software for Amstrad, also wanted listings, hints, tips, etc., etc. Tel: 0632-266 5184, ask for Paul.

Amstrad CPC 464 software for sale. Various titles including Jewels of Babylon, Message from Andromeda, Roland Caves, Amsoft Intro' to Basic. Offers? Tel: 0734-332417.

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Urgent! Urgent! Atari 500XL computer and books mags for sale. Cost £159, now for £99 bought Nov. in good condition. Tel: 01-579 5738.

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Atari Invitation To Programming 1 & 2 (unopened). Were £19.99 each, sell for £6 each or £11 for both + P&P. Tel: 0764 4477.

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Dragon printer wanted, also Alldream cartridge and Tandy software. Large amount of software to offer in exchange. Write: Ian, 37 Harehills Avenue, Leeds LS8 4EX.

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Dragon games for sale including Touchstone and Time Bandits. Send sae for full list to Liam Le, 33 Longmeadow, Torriano Avenue, London NW5 2SU.

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For sale. Dragon user mags, July 83 to August 1984, 13 issues £4.50 ono, plus 11 issues of TRS-80 Microcomputer News March 83 to February 84. Tel: Bobby on 0274-495682 after 6pm.

Oric

Oric 1 48K, vgc and £70+ books, magazines and software. Switch on power lead. Printer lead. Will sell for £150 ono. Tel: 0525-376011.

Oric 1 48K, vgc Harrier Attack, Zorgons Revenge, Multiseames £60 or swap Spectrum 48K. Working or not. Tel: Dave 0742-863925.

48K Oric 1 cassette, £200 software plus Intellivision console with six cartridges. Bargain £170 or swap for Atari 800XL or 600XL or CBM 64. Tel: 0993-882237.

Oric 1 48K, boxed with software and books including own utilities, games, etc. Sell for £110. Tel: Lydd 21460 and ask for Steve.

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Oric/Atmos software for swaps. Over 60 games including Hobbit, Chess 1/2, Zorgons, Wimpy etc. Send your list to: Kjell Brovig, Solgaard, 4790 Lillesand, Norway.

Oric 1 48K, plus £90 worth of software. A great bargain at £100. All in vgc. Tel: Hinckley (0455) 30509 after 6pm.

Oric 48K, cassette recorder, programable interface, 36 games including Hunchback, Wimpy, Pasta Blasta, Zorgons Revenge, etc, manual, three games books, £175. Tel: 0502-66898.

Oric 1 48K, brand new, boxed, never used, with two software titles. Sell for £155. Tel: 01-968 6622 Dave.

Wanted Oric Atmos software. Originals only, no pirates. Send price list to Steve Cotterell, 12 Brookmead Way, Orpington, Kent BR5 2BG.

Oric software, breakin, Dissembler, Battleships, Tunesmith, £5 lot. Software exchange, please send lists, I'll send mine. Lawrence, 57 Nunts Lane, Coventry CV6 4GZ. Amsoft Electro Freddy £2.

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Oric Atmos 48K cassette recorder, three games, excellent condition, hardly used, good value at £130. Tel: Jonathan on 01-946 2959 5-10pm, hurry.

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QUIT

'If it had carried on like that, every single person in the world would have had a computer by 1987,' said Mikro-Gen's Mike Meek, drawing a steeply sloping graph in the air with his hands.

'Not maturity, not by a long chalk,' said an educational software publisher.

And on the stand that sported the long lost name of Imagine, an LET exhibitor did a White Rabbit and was too late for a meeting to give us his opinion on the state of the home computer business.

Is it in decline? Not even by a short chalk, according to several recumbent LET exhibitors. The rapid growth, represented by Mike Meek's free-hand graphics, has merely started to level out. This is bad news for Sir Clive Sinclair, who hopes to bring the benefits of home computing to the ruddy and the Ethiop well before 1987, but at least the graph line hasn't started to go down the other side.

The re-appearance of Imagine's name might be a hopeful sign and, since LET was primarily a software show, there were brave faces all over the place. But even on the hardware front the people in the know are still looking forward. Boots, for example, is looking forward to seeing the last of its lingering stocks of Dragons, which are still available from odd stores in its 300+ chain. Some retailers are similarly hopeful of getting shot of certain Commodore computers. Shelf space is at a premium and stock must earn its keep. It can't do this by occupying space. It must be a hopeful sign that retailers are still thinking so positively.

But the LET show's most assertive indicator of the future of the home computer business was to be found on the Lightning stand. Here pride of place went to a Sinclair C5 tricycle. In the driving seat — the only seat, come to that — lay a dummy that was plainly scared out of its wits as the C5 revolved on its turntable.

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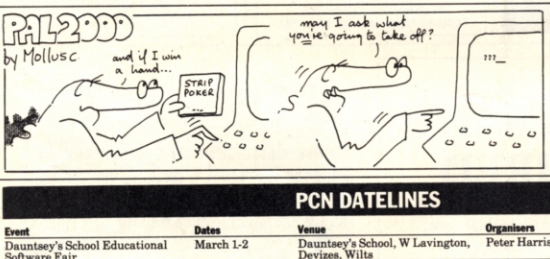

SYNTAX ERROR

If you have any malingering doubts about the Tony Crowther game Crazy Caverns that we listed in three parts last month, turn to Routine Enquiries in this issue for a full explanation.

NEXT WEEK

Extra Sharp
Personal CP/M for business, MZ700 compatibility for the home, the new Sharp MZ800 sounds like a versatile piece of kit. We fly it under both flags in a full Pro-Test.

Flexi-Spectrum
Put some life into your Spectrum character with our Flexitext listing — any proportions, dimensions or movements you like.

Amstrad serial
Not a new soap opera, although it could turn out to be the first episode in a saga — we review a serial interface for the CPC464.

BBC Sleuth
No need for a deer-stalker and a magnifying glass — we follow up the clues in a review of Sleuth, the ROM-based Basic front-end for the BBC Micro.

Gameplay bonus
Among reviews of the latest Atmos, Commodore 64 and Spectrum games we've got Subterranean Stryker, Technician Ted, and Monty is Innocent.

Monitor
Follow the twists and turns of the Acorn saga.

PCN DATELINES

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DEXPO Europe, 1985	March 6-8	Olympia 2, London	CGP 01-582 9256
Scottish Computer Show & Conference	March 12-14	Anderston Centre, Glasgow	Cahners Exhibitions, 01-891 5051
Personal Computer Show	March 13-16	Sydney, Australia	OES 01-486 1951
Personal Computer Show	March 21-24	Amsterdam, Holland	RAI Gebouw BV, Europaplein 2, 1078 GZ Amsterdam
COMDEX/WINTER	March 21-24	Anaheim, USA	Interface Group, 300 First Avenue, Needham, Mass 02194 (617) 4496600
COMDEX/JAPAN	March 26-28	Harumi Centre, Tokyo	Interface Group, 300 First Avenue, Needham, Mass 02194 (617) 4496600
Info 85	March 26-28	Olympia, London	BED, 01-467 1001
6809 Colour Show	March 30-31	Royal Horticultural Hall, London SW1	Computer Marketplace, 01-930 1612
Softcon	March 31-Apr 3	Georgia World Congress Center, Atlanta	Northeast Expositions, US 617-739 2000
Computer Assisted Learning Exhbn	April 11-13	East Midlands Conference Centre, Nottingham	Dr Phillips, Shell Centre for Mathematical Education, Univ of Nottingham, Notts NG7 2RD

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