

40p EVERY WEEK • No 110 • MAY 11 1985

PERSONAL

Computer

NEWS

STILL
ONLY
40p

**EXCLUSIVE
HANDS-ON TEST
OF THE 512K ST**



ATARI'S DREAM MACHINE

White Lightning

The Games Designer used
by the Professionals
Commodore 64



Now, without any knowledge of machine code, you can write fast, smooth, professional, totally original games and market them without paying royalties.

Even if you have already mastered machine code, we believe that the time and problems saved by writing in White Lightning's **FORTH**-based high level language could revolutionise commercial games writing for years to come.

IDEAL IDEAL is an Interrupt Driven Extendible Animation sub-Language. Once you have mastered **IDEAL**'s easy to learn set of over 100 commands and just a little **FORTH**, you will be ready to produce arcade-quality games even if you don't know machine code. Up to 255 software sprites, each with its own user-defined dimensions, can be moved around the screen (or memory), scrolled, spun, reflected, enlarged or inverted with amazing speed and smoothness. Operations are possible between screen windows, sprites and

sprite windows. Software sprites can even stretch across several screens, so those difficult scrolling landscapes that form the basis of so many games are easy to achieve. White Lightning also adds **PLOI**, **DRAW**, **POLY** and **CIRCLE** as well as fully supporting the Commodore's own excellent hardware sprites and sound facilities. The **IDEAL** routines operate in hi-res or 4-color modes.

MULTI-TASKING Because White Lightning uses interrupts, you can effectively run two programs at once. This means, of course, that games like *Space Invaders* and *Defender* can be written without complex timing calculations. So while one program smoothly scrolls the landscape, the second animates the other characters. This is undoubtedly one of White Lightning's most powerful features.

MARKETING AND PORTABILITY Although White Lightning uses an integer **FORTH** as its host language, programs can be written in a combination of Commodore **BASIC**, **FORTH**,

IDEAL and machine language. The final program will run independently of White Lightning and absolutely no marketing restrictions are imposed.

BASIC LIGHTNING In addition to the White Lightning program itself, the package also includes an extended **BASIC**. This **BASIC** adds more than 200 reserved words including all the **IDEAL** commands, procedures and a full set of structured programming commands. Up to five tasks can be run simultaneously. **BASIC Lightning** is also available separately.

SPRITE DESIGN White Lightning comes complete with a separate sprite designing program, two libraries of sprites are included and up to 255 sprites can be designed with loading and saving facilities between sessions.

The package comes complete with two 100-page manuals and a free demonstration program is included to show off the potential of the system.

Please send me the following Lightning Systems Pack(s)

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Basic Lightning Disc (\$19.95)

White Lightning Tape (\$19.95)

White Lightning Disk (\$29.95)

I enclose my cheque/P.O. for \$ _____
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Every product carries a lifetime guarantee. All prices include comprehensive manuals, V.A.T. and p & p, and includes manuals and p & p for overseas.

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DATA SOFTWARE

12 Walliscliffe Road, Weston-super-Mare, Avon BS23 1UG.
Telephone: (0934) 419921. Telex 437287 Sharel G.

COVER STORY

Atari's Attack 10

Has Tramiel come up trumps with the new range of Atari's? PCN hotfooted it out to Slough to give the new 520ST an exclusive hand-on test. And if that's not enough, we also have a Pro-test of the 130XE. Who else could give you all this and more?



OUTPUT

Adventurous moves 16

In the second part of our article on writing your own adventure, Mike and Pete Gerrard explain how to put printed page to screen.

ATMOS anatomy 20

After last week's Oric class, here comes a duo of delicious utilities for the Atmos.

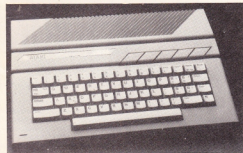
QL ROMs on 21

As the latest version of QL's ROM (JS, to those in the know) hits the shops, we show where the improvements can be found.

HARDWARE

130XE Revs up 18

With a price tag of just under £170, 128K of memory and a wealth of games already released, the 130XE appears to be on a winning streak. We take a look.



SOFTWARE

QC central 27

At last, a C compiler for the QL. GST has leapt to the rescue and it's an eminently usable package indeed

Turbo charged BBC 28

Cheap, cheerful and excellent value — Alter Computer's fast Pascal package is a bargain that Beeb owners shouldn't miss

REGULARS

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Commodore announces losses; Atari support grows; Compaq launches new machines; and what price portable computers?	Lastest releases from the software houses.
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Fight out the war of words on our pages. More readers share their views.	Quit 32
Microwaves 9	After the good buys, a few humorous goodbyes.



PLUS PROBLEM

The new BBC B Plus computer is being viewed unenthusiastically by the major multiple stores, but Acorn is receiving the news phlegmatically.

At £499 the machine is unlikely to sell in the sort of volumes that would appeal to the likes of Boots and WH Smith, but Acorn sees it as much more of an 'independents' machine, selling through smaller dealers who can give it better technical support.

Acorn has been running a presentation for software houses and distributors for about a month now, but samples of the machine didn't go to the multiples until the Friday before last. WH Smith and Boots like to give computers a thorough evaluation before deciding to stock them, and it's unlikely they'll make a decision for another week or so.

The possibility of one or more of the chains turning it down is being prepared for. According to an Acorn spokesman it's quite possible that they'll view it as too pricey for a home machine, and considering their track record of trying to sell business machines (WH Smith and the Advance, for example) they may not think it's viable.

The last year or so hasn't exactly been a wonderful experience for micro shops of any description. The unwary have been left half buried in Oric Atmos, Acorn Electrons, Dragons and even Lynxes. This has disenchanted a lot of small dealers, and Boots has on occasion seemed ready to start a rummage sale at the drop of a hat. The Boots price pledge may not have always been the best possible deal, but the company has offered exceedingly keen pricing on ZX81s and Dragons.

All this has meant the multiples have shown a willingness to garotte low-selling backsliders, and they have been able to exert their muscle to exert a considerable influence.

Acorn's own position is more complex than this because the company also has to rebuild its bridges to small dealers who were caught out by the Electron price-cut this spring. The problem here will be that the financial loss to the dealers can be made up, but regaining their confidence will take more time.

With the new Plus added to the Acorn range it seems clear that the company, as promised, will be concentrating on selling to small businesses and educational users. The price tag on the Plus is too high for anything else — although the way prices are moving it may even be too high for these markets.

Acorn's gamble must therefore be to establish the Plus as a prestige successor to the Model B, and first impressions are that the odds are stacked heavily against the company.

As part of its bid to regain the market's attention Acorn has been dropping its software prices in three separate brackets. Schools and parents (the last one may be difficult to prove, but kidnap a kid and take it along with you) will be able to save 50 per cent on education titles if they buy more than five. If you don't buy more than five you can save 30 per cent, which is the amount the company is dropping the price on almost everything.

Acornsoft Small Business software drops 43 per cent if you buy all seven together, while Electron titles except Elite (sorry), Countdown to Doom and Linkword come down to £6.99.

Fancy flyer

May 25 will see the release of Jump Jet, a combat and flight simulator from Anirog. It was



Prepare for take-off.

written by Vaughan Dow, an ex-VTOL and test pilot and author of Flight Path 737.

The four skill levels reflect RAF ranks, from Flight Lieutenant to Group Captain. Jump Jet uses Anirog's voice reproduction technique, Voice Master, to convey important information to the pilot.

The first machine to see the game will be the Commodore 64. Spectrum, Amstrad, BBC, C16 and Vic 20 owners will have to wait until July 22. Versions for Atari, MSX and Tatung machines are planned for September, costing £9.95.

COMMODORE HIT BY LOSSES

If you thought things were looking bad in the home micro market, confirmation arrived this week with news from Commodore where the world's number 1 is up against the ropes.

The US giant has posted third quarter losses of \$20 million — a year earlier it was showing profits of \$36 million. Worst of all, chairman Irving Gould has warned that the company will probably show a loss on the year's operations. It's been a while since that happened.

Mr Gould was quoted in the *Financial Times* last week as saying earnings were affected by a price reduction in Febru-

ary, a reluctance of retailers to rebuild their depleted inventory and by the general slowdown in our non-US sales.

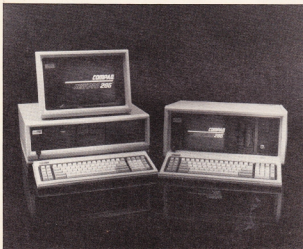
This sounds like a bit of guff to us, but taken at face value what Mr Gould is saying is that Commodore couldn't afford to go into a price war, and even after it did retailers still thought its products were wrongly priced.

The truth is that Commodore went into 1984 like a champion and came out of it staggering. Its product range was badly scrambled by the introduction of the C16 and Plus4 — the 128 is the machine it should have released for Christmas.

Since then a round of price cutting on the newer models but not on the 64 has made a mess of the company's price structure. The more recent launch of the IBM-compatible business machines may defray some of the worst possibilities, but Commodore could get badly hurt trying to reassert its former position at the top of the business market.

If anyone from Commodore is reading this, we'd suggest you drop the 16 and the Plus4, cut the 64 to the position the Vic once held, move the 128 into the 64's slot and put your faith in God and the Amiga, not necessarily in that order.

COMPAQ GOES TWO UP ON IBM PC AT



Latest Compaqs —
AT compatible
at cut prices.

Compaq — the most successful manufacturer of the IBM compatibles — announced two new products last week that will increase the pressure on Big Blue to sort itself out.

The Compaq Portable 286 and Deskpro 286 are compatible with and, according to Compaq, better than the PC AT.

Both are based on Intel's

latest hot processor, the 80286, and the portable is easily the most powerful system in its class with a 20Mb hard disk and up to 2.6Mb of RAM. Compaq says it will run up to 30 per cent faster than the AT but you can slow it down for full AT compatibility.

The Deskpro will give up to 70Mb of hard disk space and 8.2Mb of RAM. Hardware and

software compatibility extends to MSDOS 3.1, the new IBM PC network, the Topview operating system and the enhanced IBM graphics adapter.

The machines will be launched in the US this month, arriving in the UK in late summer.

Prices have not been fixed but British owners can expect to pay 'around £4,000'.

Lisa loses out to Mac

The future of Apple's Lisa is now clear — it's being dropped in favour of the Macintosh.

Lisa was launched in 1983 and brought the now fashionable windows, icons and mice into public view for the first time, but sales of the machine have been very low, largely because of its high price and lack of software.

Apple reduced Lisa's price to £4,000 last year but is now to replace it with a 512K Mac with a 20Mb hard disk. A range of peripherals designed to enhance the Macintosh's power and business image will be made available later this year.

With no radically new machine, and GEM and Atari posing a threat, Apple has to make the machine more attractive than GEM-based systems.

The 4th National Apple User Exhibition (May 9-11) will see demonstrations of Macs networked with Appletalk driving laser printers via Laserwriter. Interest among UK software houses is high: Lotus will be showing Jazz (due for release May 27), Blyth Software will launch a networked Omnis 3, Pace is developing a comms package and Psion has a Macintosh version of its Chess.

Price error

Forth may be a fast language, especially on the QL, but that's no excuse for the rampant inflation we applied to Computer One's version. It costs £39.95, not £139 as we stated in issue 106.

Legal aid

Readers with long memories may remember the fuss being created last year over something called The Data Protection Act 1984 — a new law designed to cover persons and organisations using computer databases.

As with all laws, the detail is mind-bogglingly complex with lots of clauses defining who is affected, and why, and what they have to do about it.

To help, the Office of the Data Protection Registrar is issuing a series of booklets explaining the law and its provisions. If you think you might be affected, you can get copies from Chambers of Commerce, National Computing Centres and a host of other places, or direct from the Office of the Data Protection Registrar, Springfield House, Water Lane, Wilmslow, Cheshire SK9 5AN.

MODEM LINK FOR ATARI FANS

Long-suffering Atari owners could be forgiven for thinking that Christmas has come late this year. The kick up the pants that Jack Tramiel has given the slumbering US company has had the noticeable side effect of waking up several other parts of the industry.

Leading the revival is Miracle Technology which has announced a modem interface and communications package that offers full Prestel facilities.

The package labours under the unwieldy name of Multi-Viewterm Datatari but makes up for that with an impressive specification. It will handle baud rates of 1200/75, 75/1200, 1200/1200 and 300/300. The cable comes with 13-way plugs at the Atari end and a standard 25-way plug to fit Miracle Technology's range of modems.



Prestel power — Atari users get on-line at last.

The interface and disk-based software give Atari owners access not just to Prestel but also to electronic mail, telex and a range of bulletin boards. The system also supports the downloading of telesoftware.

Best news of all is that the package is compatible with all

8-bit Atari's from the old 400 and 800 through the XL range and the new XE series.

It should be available through most of the main Atari dealers or by mail order from Miracle Technology, St Peters Street, Ipswich IP1 1XB. Price is £61.10.



When is a portable not a portable?

What do you reckon the specs for a really classy portable computer should be? Twin micro floppies, 80x25 LCD, 256K of RAM, IBM compatible — go on admit it, that's what you're thinking isn't it?

Most of the world's micro industry thinks this too, as you'll see by the number of manufacturers falling over each other to get HP110 clones onto the market. The net result is that, if you're not careful, you'll find yourself salivating over a substantial piece of kit that... well, that keeps falling off your lap, for a start.

The first successful portable computers (aside from the likes of the Osborne and the rest of the luggable crowd) were the Tandy, Olivetti and NEC laptops based on the same Kyocera design. These are still fairly widely used, but manufacturers have looked at their perceived limitations and started designing them out.

Which means, if a 40x8 LCD isn't good enough you put on a bigger fold-up screen (so you're sitting tapping away on a bus, then the conductor brushes past and rips your screen off), while if the memory isn't big enough you install more of it, forcing up the price of the basic unit.

The end result is an expensive piece of hardware that has sacrificed a great deal of its portability. And it's decidedly low-tech.

Why low-tech? Because it's trying to be a self-contained unit, likely its desktop rivals, whereas the earlier portables were really remote terminals. These allow you to work on the move, and if they're used in conjunction with desktop or mainframe computers you can still have desktop power when you need it.

But there's one good thing about the new generation of portables. If the manufacturers convince enough mugs they're a good idea then the demand for the earlier portables will drop. The manufacturers will therefore have to drop the price, and then we can all buy one.

MUSICAL MICROS

Virgin Games' next release will be GhettoBlaster. Written by Tony Gibson and Mark Harrison, it features 12 original backing melodies.

It's not another Breakdance simulation; you're responsible for collecting and delivering music tapes around the town for the company Interdisc. Life is made harder by the inhabitants who may steal your batteries or turn your volume down.

Gibson and Harrison normally code for Taskset, but offered GhettoBlaster to Virgin. The game should be out soon.



GhettoBlaster — touch the characters with notes to make them dance.

First to the defence

First Software is living up to its name with a remarkable product for Commodore 64 owners — an ADA compiler.

ADA is a very high level language much beloved of the US Defence Department where it's the number one choice for controlling missile systems.

First's package consists of an editor, syntax and semantics checkers, assembler and disassembler complete with a fat manual for £50. This may be the first implementation of ADA on a micro.

Slogger bid

Support for the ageing Acorn machines, the BBC B and Electron, is still thriving with a selection of new products from Slogger Software. ROM manager chips BeebMan and ElkMan provide facilities for examining, enabling, disabling, and generally fooling around inside the ROM system. The ROMs cost £17.50 each and include facilities for accessing sideways RAM, if you have any.

Commands include `OROM` to turn off a ROM (useful for avoiding conflicts), `KIST` which gives the status of all the 16 function keys, hex and mnemo-

nic dumps of memory and facilities for moving ROM data from the filing system or memory, into and out of the ROMs themselves.

Slogger has also produced a ROM board for the Electron with space for 8 ROMs of either 8 or 16K. The unit plugs into the back of the Electron and is fully compatible with the existing Acorn add-ons, the Plus 1 and Plus 3. It gives Electron users access to most of the ROM software for the BBC including View, MultiForth-83, and EX-MON. The Rombox costs £44.95 including postage and packing and is available direct from Slogger Software 0643-811634/41622.

HISOFT

High Quality
Microcomputer
Software

CP/M PASCAL

When choosing a compiler, support is crucially important. It is vital to ensure that you will receive technical back-up for the package as quickly as possible. This may prove difficult, if not impossible, when the software was designed in another country and you have no access to the authors. **HiSoft Pascal** is a British product, created and manufactured by ourselves and fully supported by our technical team here in Dunstable. We offer inexpensive upgrades and we are continually extending and improving the compiler.

HiSoft Pascal is available in a wide variety of Z80 CP/M disc formats, is very close to Standard Pascal and comes supplied with a comprehensive and sophisticated full screen editor (ED80) which is specially designed for program development; the editor may be easily configured to suit all displays and also for special keyboards and individual keystroke sequences.

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CHARTS

GAMES

TW	LW	TITLE	PUBLISHER	MACHINE	PRICE
1	1	Softaid	Softaid	SP, C64	£4.99
2	2	Wid Series B'ball	Imagine	SP, C64	£6.95
3	4	Brian Jacks S'Star	Martech	SP, C64, AC	£7.95
4	3	Spyhunter	US Gold	SP, C64	£9.95
5	6	Gremlins	Adventure Int	SP, C64, AC	£9.95
6	8	Starion	Melbourne	SP	£7.95
7	5	Ghostbusters	Activision	Various	£9.99
8	—	Int Basketball	Commodore	C64	£5.99
9	11	Pitstop II	CBS/Epyx	C64	£10.95
10	7	Impossible Mission	CBS/Epyx	C64	£9.95
11	—	Shadowfire	Beyond	SP, C64	£9.95
12	15	Gyron	Firebird	SP	£9.95
13	9	Bruce Lee	US Gold	SP, C64	£9.95
14	14	Sorcery	Virgin	Various	£8.95
15	10	Moon Cresta	Incentive	SP, C64	£6.95
16	—	DT's Decathlon	Ocean	SP, C64, AM	£6.90
17	13	Dragontor	Hewson	SP	£7.95
18	16	Raid over Moscow	US Gold	SP, C64	£5.95
19	—	3D Star Strike	Real Time	SP, AM	£5.95
20	12	Grand National	Elite	SP, C64	£6.95

SPECTRUM

TW	TITLE	PRICE
1	Softaid	£4.99
2	Wid Series Baseball	£6.95
3	Spyhunter	£9.95
4	Starion	£7.95
5	Gyron	£9.95
6	Brian Jacks S'star	£7.95
7	Gremlins	£9.95
8	Grand National	£6.95
9	Bruce Lee	£9.95
10	Moon Cresta	£6.95

COMMODORE

TW	TITLE	PRICE
1	Softaid	£4.99
2	Int Basketball	£5.99
3	Pitstop II	£10.95
4	Wid Series Baseball	£6.95
5	Impossible Mission	£9.95
6	Gremlins	£9.95
7	Theatre Europe	£9.95
8	Brian Jacks S'star	£7.95
9	Entombed	£9.95
10	Cauldron	£7.99

MICROS

BELOW £1,000

TW	MACHINE	PRICE
1	Spectrum	£129
2	Amstrad	£349
3	CBM 64	£179
4	BBCB	£399
5	Atari 800XL	£125
6	Electron	£129
7	Einstein	£499
8	CBM 16	£140
9	MSX (series)	£250
10	Sinclair QL	£399

ABOVE £1,000

TW	MACHINE	PRICE
1	IBM PC XT	£2,340
2	ACT Apricot	£1,760
3	Compaq	£2,064
4	Olivetti M24	£1,776
5	Wang Professional	£3,076
6	Ericsson PC	£1,917
7	Macintosh	£2,064
8	ITT Extra	£1,997
9	Columbia PC	£2,478
10	Corona PC2	£2,498

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 May 2. The games chart is updated every week. The prices quoted are for the non-floppy 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 6396.

WOOTTON COMPUTERS

	Our Price	Phone price
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528 S.T. 524K Computer + 3.5inch disk drive 500K		
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800Z 34 Computer	£129.95	£86.00
1010 Program Recorder	£34.95	£32.99
1050 Disc Drive - D03	£199.99	£165.00
800Z + 1010 Cass. + Invt. Prog.		£129.00
— Pole Position + 5 Mini cassettes		
800ZL - 1050 Disc Drive + Home Filing Manager		
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K.S. PERIPHERALS		
Masterman Tally M1 82 + (40Cops)	£248.55	£218.95
CZ77 Touch Tablet + Auto Act. Soft.	£48.95	£46.95
K.S. SOFTWARE		
Adventure	£3.99	£3.45
Chess	£3.99	£3.45
Solitaire	£3.99	£3.45
Lane Racer	£3.99	£3.45
Pengo	£3.99	£3.45
Pole Position	£3.99	£3.45
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Teach Typing (cart)	£12.99	£11.99
HOME BUSINESS		
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Kingston (cart)	£9.99	£8.99
C.D.C. Show 155(00) 10 in box		£16.99
Memorex Discs 155(00) 10 in box		£19.45
Corona Disc 10 in Library Cass		£19.99
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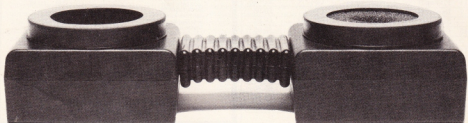
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1200 Modem	£59.95	£29.95	£30
ZX Spectrum Pack inc: Modem, interface, cable & software	£84.95	£39.95	£45
BBC Model 'B' inc: Modem, cable & software	£79.95	£39.95	£40
Commodore 64 inc: Modem, cable & software	£79.95	£39.95	£40
Amstrad CPC 464 inc: Modem, cable & software	£89.95	£49.95	£40
Acorn Electron inc: Modem, cable & software	£89.95	£49.95	£40
Epson PX8 cable only	£19.95	£9.95	£10

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Share your words of praise or send us a rocket about PCN. We want to hear your views and feelings on the articles we print — and those you feel we ought to. Write to *Random Access, Personal Computer News, Evelyn House, 62 Oxford Street, London W1A 2HG*. You could win £15 for the best letter of the week.

Quick guide to 464/664 harmony

We are eager to ensure that any programs published for the Amstrad 464 machine will also be entirely compatible with the 664. There is no problem with prerecorded Basic programs, however typed in programs must not use variable names that have now become reserved words (FILL for example).

Assembler programs are, however, a different matter. Provided that they only rely on addresses and routines that are documented in our Concise Firmware Specification there should be no problem. However, programs that make use of undocumented addresses and routines that have been found by inspection cannot be guaranteed to work.

A case in point is the Event Block Effects article by J Keaneilly (issue 108). The event routines he uses will work on the 664 exactly as they did on the 464 — they are documented in the Firmware Spec.

Unfortunately, his program makes use of a pointer that holds the start address of the Basic program area — this was not documented and has now changed. Consequently, the program will not work on a 664.

The program also makes assumptions about the format of Basic program storage — this is undocumented and is also liable to change without notice.

Mr Keaneilly is not the first and will probably not be the last to make this mistake. However, by publishing this letter, we hope more people will recognise this potential problem.

Cliff Lawson,
Software engineer,
Amsoft.

PCN should become multi-lingual

I am writing in agreement with CB Goldman, the 'minority micro user' (issue 105). Your magazine lacks both diversity and content.

Being a weekly magazine you should have a lot more space to publish articles and programs than your monthly competitors, but looking through issue 105 I found to my dismay that over half the magazine consisted of adverts.

The bits of text I managed to find in between was anything but varied; in fact the only article which did not apply to any popular micro specifically was the Hacker's Handbook.

Putting this aside, it bothers me how, with a title like Personal Computer News, you only deal with such a small aspect of personal computing. There is a lot more to the subject than Basic, arcade games and machine code. I wonder if you have ever published anything on Forth, Fortran, Lisp or Logo — languages available for most personal computers.

It's wrong that all magazines should follow the trend only to produce material for the more popular aspects of computing and I hope PCN will improve in this way.

P Armour,
Fleetwood, Lancs

In an average four-week period PCN publishes more than 100 pages of editorial — a good deal more than most of our monthly competitors. Yes, we do publish articles on all languages — the last was a review of QL Forth in issue 106, and next week sees the start of a series of articles looking at alternative languages to Basic.

While each issue generally contains one arcade game listing, the rest of the Output section is devoted to utilities and other aspects of programming. But we're not complacent and I'd like to receive more letters on these subjects. — Ed

Sord user group opens its letterbox

I would like to inform your readers of a Sord/CGL M5 user group which has recently been formed. If any of your readers wish to join a software library or want any leaflets they should send a stamped addressed envelope to the address below. We also have details of software from independent houses.

David O'Grady,
M5 Users Group,
19 Balally Close,
Dundrum,
Dublin 16

Boffins take shine out of computers

I was interested to read Mike Howard's comments on your magazine (issue 107). In particular, I was taken by his comments on the listings.

I'm not a regular contributor but I've had about four games published in your hallowed pages and his comments dug a little deep. Obviously he intended to criticise the games and not the various utilities and he suggests more mathematical content to make them more like programming instructors than functional listings.

I'm sure that many others like me would rather type in a game that does what it should than a listing which does nothing but prints semi-circles.

We are in totally separate areas of computing — he is

clearly the computer boffin (no insult intended) and I'm the casual user. I hope Mike Howard's comments won't cause you to go completely boffinised. Don't make computers a dull hobby and don't make PCN a dull magazine.
Andrew Clarke,
Boddesley Enzor, Warwick.

PCN, dull? No chance — Ed.

Getting another byte at the cherry

Further to the encouraging coverage that ITL's Byte Drive system has been getting recently, culminating in the announcement of the release of the Macro-Assembler package from McLaughlin (issue 106) ... dare we ask for a review?

I am prompted to write again to clarify my appreciation of the BD500 system, as my initial letter (issue 100) seems to have sparked off a whole spate of activity from other owners. I must admit to having been very much encouraged by the response and do whole-heartedly agree with the general praise of this quite remarkable application.

However, my own problem still exists in as much as I am still without my Capable Cable and am having difficulty trying to trace the 'administrators' of Tyrell Computers affairs to lodge a claim for my property.

Stuart T G Wright,
Clacton, Essex.

Adopting an Elite Vector for success

Thank you for publishing my letter concerning Acornsoft's cassette (issue 108).

I feel it is only fair to inform your readers that my debugged version of the Elite cassette has now arrived, thanks to the assistance of a company called Vector Marketing.

It would seem that all Acornsoft's affairs are now being handled by the above company. Within two weeks of my telephone call it has been able to locate and replace my faulty cassette. The telephone number is 0933-228953.

Mike James,
Leeds.



Pirate tape or not, you've just arrested the superintendent's son.



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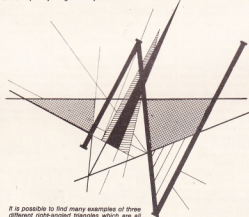
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TRIANGLE TANGLE

Brush up on your geometry to unravel the answer.



It is possible to find many examples of three different right-angled triangles which are all equal in area. Can you, however, find three such triangles for which every side is a whole number of units (an integer)? Try to devise a program to find the trio with the smallest possible area.

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MICROWAVES



Send your hints and tips
to **Microwaves, PCN**
62 Oxford Street,
London W1A 2HG.

Amstrad caps lock indicator kicks off

There have been a number of comments from Amstrad CPC464 users about the lack of a caps lock indicator. Here is a short routine that uses the screen border colour as this indicator. Once loaded, the program can be deleted.

As written, the border colour is set to green (colour 09) by the two 09s in line 150. These can be changed — if the two numbers are different, the border will flash.

The indicator is kicked by the frame flyback so the display is updated every 1/60th of a second.

R J Halsall,
Wokingham, Berks.

```
10 REM A CAPS LOCK state indicator
20 REM Written by R.J.HALSALL
30 hi=HINEM
40 MEMORY hi-73
50 FOR loc=hi-72 TO hi
60 READ code$:POKE loc,VAL("&"+code$)
70 NEXT
80 CALL hi-72
90 DATA 21,e1,e9,22,30,0,f7,eb,21,25,0,19
100 DATA e5,21,2e,0,19,eb,e1,6,81,cd,d7
110 DATA bc,f7,eb,21,26,0,19,e5,4e,23,46
120 DATA 60,69,19,44,4d,e1,71,23,70,c9,0
130 DATA 0,0,0,0,0,0,0,cd,21,bb,3e,ff
140 DATA bc,01,0,0,c2,2c,0,06
150 DATA 09,0e,09
160 DATA ed,38,bc,c9
```

QL routine hooks up to Epson printer

To dump a screen from the QL to a printer, try this program. The escape codes are for the Brother HRS, but they work with most Epson compatible printers. Although the program is written in SuperBasic, it performs at an adequate speed because it prints horizontally instead of

vertically.

The routine only copies a screen area the same size as window 1. Line 170 works out which 16bit word to look at. 180 bitwise ORs the two bytes to the red and green ones. In Mode 4, white red and green areas will become solid, in Mode 8, white and magenta will be solid, the rest of the colours being shaded.

I G Booth,
Warrington, Cheshire.

```
100 DEFine PROCedure duap
110 OPEN#10,ser1:BAUD 9600
120 PRINT#10:CHR$(27):"A":CHR$(8);
130 FOR loop1=1 TO 112 STEP 2
140 PRINT#10,CHR$(13)
150 PRINT#10,CHR$(27):"L":CHR$(144):CHR$(1);
160 FOR loop2=199 TO 0 STEP -1
170 s=loop2*128+133127+loop1
180 t=PEEK(s):IPEEK(s+1)
190 PRINT#10,CHR$(t):CHR$(t);
200 END FOR loop2
210 END FOR loop1
220 END DEFine
1000 DIR adv_1
```

Another quick hint for the Amstrad

Issue 106 Microwaves contained two useful features on the Amstrad that are little

known. I add to these one more: Pressing CTRL SHIFT CAPS LOCK will effectively give SHIFTLCK ie all the keys are shifted.
D O Wright,
Sheffield, S Yorks.

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ATARI ADVANCES

It's arrived at last. John Lettice subjects the 520ST to his rigorous standards in an exclusive PCN preview of the Atari onslaught.

The new Atari are coming — and that's official. Last week there was one 520ST in this country and a dozen or so in Germany, but 200 development machines (for software companies only, at a cool \$4,500) are scheduled for arrival this month, and the first full systems should reach end-users before the end of the summer.

The ST series is Jack Tramiel and Atari's bid for the hearts and minds of the world's computer users. It's based on the Motorola 68000 wonder-chip used in the Apple Macintosh and incorporates Digital Research's Graphics Environment Manager (GEM). The 520 has built-in floppy and hard disk interfaces which will allow you to link up to Atari's own low-cost drives. Link together a 520, monitor and twin floppies and you've got a system more powerful than the Macintosh for around £900. If it works — and when PCN saw it last week it looked like it did — Atari could corner the serious hobbyist market and at the same time make spectacular inroads into the business market.

Currently the ST is nearly finished. The review machine was running a disk version of GEM, and something like the first 1,500 machines will come in this configuration. Full production machines will however come with the software on ROM, the disk version only being produced to buy sufficient time for a few last minute 'features' to be corrected.

These machines will also come with DR Logo and Personal Basic (which will be Microsoft-ish with graphics, sound and a few hooks to GEM) bundled. These two languages are still under development, and weren't in a testable state when I saw the machine. It would be nice



ST, mouse and disk drives. The 1Mb version is on the left. Note Breakout, peeking from below the control panel.

to think the finished Personal Basic will be as good as the Microsoft Basic running on the Mac, but this is quite a target.

GEM itself is now running on the 520, and as you'd expect from a 68000 processor, it's running very fast indeed. The ROM version should be even faster in that it will cut out any time-wasting disk accesses. There are no applications running fully under the system yet, but Lifetree Software's *Gem World*, which is a development of *Volkswriter Deluxe*, should be ready shortly (the IBM PC version should be available in days rather than weeks). A few other packages are under development.

Atari's intention would seem to be for the machines to have a few applications packages in common with IBM, Apricot and sundry PC-compatible versions of GEM, but to go it alone beyond that.

The \$4,500 price tag for development systems is symptomatic of this, Atari's reasoning being that, if a software company is serious about getting software out for a new machine it will be sufficiently serious to cough up enough loot to get an early look at it.

About GEM

Aside from GEM there are no finished twiddly bits on the machine as it stands at the moment. While Atari promises (if promises were processors) great things for the finished item, the STs stand or fall on the efficiency of GEM. It's therefore worth having a look at what GEM sets out to be, and at what Atari and Digital Research have at stake.

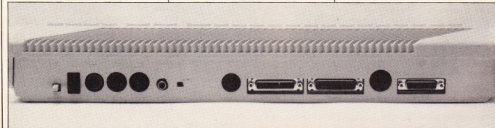
Two years ago Apple and IBM fired the opening rounds in a battle for control of the micro industry. IBM launched the PC and Apple launched the Lisa. The PC was traditionalism writ large — slow,

bulky and expensive, while Lisa, although still expensive, was hailed as the way machines would go in the 80s. The PC was quite clearly a sitting duck but proceeded to more or less take over the world. Lisa bombed.

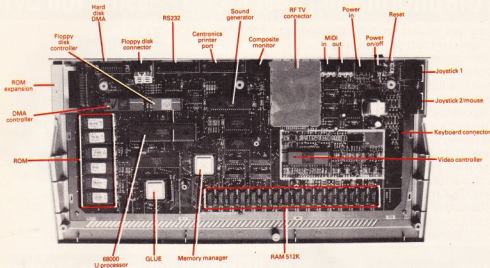
Since then this state of affairs has become even more perplexing. Apple has persisted — understandably, considering the R&D big bucks involved — with the technology in the shape of the Macintosh, but there have also been a few spirited attempts to install Lisa-like software on the PC and, more recently, on everything, home machines included.

The basic intention of the companies involved in developing this software is to duplicate a desktop on your computer's screen and to allow you to use a mouse to point at whatever you want. The minimum requirement is usually a calculator, digital clock, filing cabinet and/or disk and waste-paper bin. Use the mouse to point at the disk drive and a window containing pictures (icons) of the files on it will be shown on the screen. Point at the file and it will be 'opened.'

That's the theory. Unfortunately, putting it into practice isn't quite that



Rearview, left to right: reset switch, power switch, power, Midi out, Midi in, TV, channel switch (US only), RGB, Certronics, RS232, floppy disk, hard disk.



sim[®]. Your desktop has to operate as a "front end" to your applications software, which is presented as a file on the desk. At its simplest, instead of typing WORDSTAR you'd point at a file called Wordstar and it would load. Exit Wordstar and you should get back to your desktop.

And there's the rub. Existing PC users will have a fair amount of software that was developed before their new front end, and they'll be righteously indignant if all of it is made redundant. This doesn't matter for new machines like the Mac or the Atari, but it does for established business users.

Enter two major software producers, with two different approaches. Microsoft, which produced MSX Basic and MSDOS, the PC's operating system, plumped for total compatibility with its front end, Microsoft Windows. This may not have been a totally smart idea as Windows has been coming Real Soon Now (RSN) for over a year now. Arch rival Digital Research has taken the other approach, which means that GEM won't run with everything but which also means that its available now. More important, it's available on home computers in the shape of the Atari ST series.

This last point is crucial to DR's long term strategy. Microsoft won the important operating system contract for the IBM PC and DR is therefore in the position of having to break back. DR is therefore pricing implementations of GEM on the PC and its rivals low, and is simultaneously linking with Atari to produce it on relatively cheap home/business crossover machines like the STs. It's a big gamble, but the goal is to make GEM an industry standard in the same way as MSDOS became an industry

standard, and so the rewards for success will be high.

Operation

The ST PCV looked at was, so far as this country is concerned, a rare bird. This particular machine had, towards the end of March, been sent specifically to Sam (son of Jack) Tramiel, and had a delivery label on the underside to prove its collectable status. In operation, however, it was similar to the PC version of GEM which PCV has had on test for around a month now, and this, although showing a few rough edges we'd like to

you gently what's up. The PC version of GEM shows a regrettable tendency to let you try to do something silly (say, load a data file without loading the relevant program), not let you do it, but not tell you why you couldn't do it.

The earlier versions of the Atari GEM produced more serious goofs than this, giving you traditional unintelligible disk error messages (grab the manual and look up error 42) without a window in sight.

Atari says, however, that it is aware of the problem and will be correcting it. As far as more comprehensively friendly



Side view showing the cartridge slot

see corrected, seems to be a success.

Some of the initial problems in using GEM can be put down to its friendliness. On several occasions I found that what appeared to be a bug was in fact something that could be corrected by reading the manual, the problem being that it's so easy to use you don't feel you need to look in the manual.

The error messages are a more serious problem because a friendly front-end should, if you do something wrong, tell

messages are concerned it looks like the ball is in DR's court. Initially there seem to be areas where the Mac's friendliness beat's GEM's, but if GEM is to become an industry standard, we can expect developments of it to follow. If you consider the amount by which the prices of the STs undercut the Mac you find yourself not wanting to check a free nag's fillings.

The system I saw had one interesting little oddity. The standard GEM package incorporates a calculator icon that

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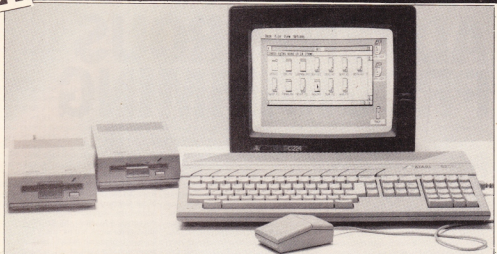


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HARDWARE PRO-TEST: ATARI 520ST



The screen shows the GEM desktop in medium resolution mode.

11 you can operate with a mouse. This wasn't running on the ST, but instead there was a calculator-sized Breakout game you could play with the mouse. The old style Atari Corp, it would seem, is by no means dead...

Hardware

If all goes well the software will be attractive, but the hardware is finished and it's poetry. It's difficult to take in the beauty and economy of the circuit board from a black and white shot, but if you know what to look for you'll see what I mean. The most significant thing about the PCB is the fact that there are no jump leads indicating last minute corrections, and this on a very early machine.

This machine is significantly more powerful than an IBM PC, yet there are very few chips on the board and the circuitry is widely-spaced, making for a very cool running machine. Atari may have put one over on me, but I couldn't see any sign of a heat-sink. The secret of this is simple — custom chips. Atari has successfully depopulated its board by condensing the gubbins into just a few chips.

Outside it has got practically every interface a reasonable user is likely to require. There's a TV output, monitor, twin joystick ports, Centronics and RS232. Besides this there are a Midi interface (used for connection to synthesisers), a floppy disk interface and a hard disk interface.

These last two are particularly interesting. Two kinds of floppy drive are now ready (500K single-sided and 1Mb double-sided) and the hard disk has made a brief appearance. The hard disk exists, and I've seen it in operation, but it's currently in Germany, much to the chagrin of Atari UK.

All of the storage systems are intended to be extremely cut-price and

should be available in time for the launch proper. They'll also be interfaced to other, non-Atari micros, this being promised by Christmas.

The display is also worth looking at. The system pictured on the cover of this issue had a software-switchable low/medium resolution monitor and the screen shown on the cover was actually in low resolution mode. Colour is still possible in medium resolution, but there is also a high resolution monitor which is monochrome only. This was, naturally, in Germany.

Verdict

The ST itself is fast, powerful and attractive, although even the cut-down

version promises to be a shade on the pricey side for a mass-market machine. As an operating environment GEM also looks good but it's doubtful if it can become so universal that it percolates down to low-cost machines.

Even if it does it's not certain that it will be of much use to entry-level users. In that sense there will still be room for cheaper machines, including Atari's 130XE, in this Christmas's marketplace.

Atari under Jack Tramiel is embracing the new 'power without price' slogan wholeheartedly, and if this sort of power can come down to this sort of price, who knows what will be available for £200 in 1986. If it's possible to design a sure-fire winning machine, this is it.



Side view showing the joystick ports. Note the 'icon' in-between.

SPECIFICATIONS

Processor	Motorola 68000
RAM	512K
ROM	192K
Storage	500K or 1Mb floppy disk (extra) or tape (standard)
Display	320x200/640x200 switchable colour display, 640x400 monochrome
Interfaces	RGB, UHF, Centronics, RS232, Midi in/out, floppy disk, hard disk, ROM cartridge

ADVENTUROUS PROGRAMMING

Last week Mike and Pete Gerrard outlined the general approach to adapting a book. Now programmer Pete converts the Conan Doyle yarn that they chose, 'The Sign of Four', from printed page to program.

In the previous article we discussed the problems of making a Conan Doyle story into an adventure. We said we divide the work into writing and programming, and then go our own separate ways.

As the programmer, I am presented with a collection of A4 sheets, usually one for each location (see issue 105). These contain the room descriptions, and any possible changes as the adventure progresses, the challenges (if any) to be found at each location, messages or objects to be found there, and the directions in which the player can move from.

I also get the map for the game at this stage, although this is of surprisingly little use until it comes to testing the finished game.

You might think this would make life a lot easier, but in fact it's the source of many problems. As with preparing the A4 sheets in the first place, the question is always 'where to start?'

Obviously a short introductory program is needed to set the scene, which is the purpose of the short listing called *Start*. Examining the listing reveals that a number of conventions have been observed.

For instance, Line 10 contains the cryptic phrase PRINT "(CLR,BLK)": This means: type in the word PRINT, a set of quotation marks, and then the keys marked CLR and BLK. In other words, we want to clear the screen and start printing text in the colour black. (CD) implies that you need to press the cursor down key, to move text down, and any others used should be self-explanatory.

Another point to note is that you must use the abbreviations for keywords when entering some of the longer lines, eg use ? Instead of PRINT, T shifted H instead of THEN, and so on. Finally, owing to the limitations of my printer, letters entered using the Shift key are printed out in italics, and letters entered normally appear in upper case. Just something that we all have to live with.

Lines 210 and 220 load and run the main program by printing the name on the screen and poking a carriage return, the letters R,U,N, and another carriage return into the keyboard buffer. This program is for disk use, so tape users should exchange the 8 towards the end of line 210 for a 1.

Main program

First write out all the verbs and nouns you think you'll need in the program. This list will change and expand as you get further into the program, but this gives you a starting point. The program checks for the first four letters of any word that the player might use, so lines 5100 to 5103 contain the data for all your verbs, and lines 5200 to 5205 contain the data for all nouns—objects—used in the game. All these objects have to start life out somewhere, or be hidden from view until the player can find them, so line 5004 initially sets everything to zero. The player won't come across anything until we let him.

You also need some longer descriptions for each object as it isn't much use telling a player that he can see a TELE when we want him to see A TELEPHONE. This is all found in lines 5500 to 5513.

respectively. This is read in by line 5001.

All that remains before the real work begins is to type in the location description. Initially, these are taken directly from the sheets of A4 paper supplied by Mike Gerrard. Quite often, when the adventure expands faster than the universe, you have to go back and abbreviate some, but as this is simply a boring typing job which requires no programming skill at all, it's best got over and done with.

Consequently, lines 2000 to 2384 contain all the location descriptions. The variable used to tell the program which location the player is currently in is the variable CP, which is controlled by lines 4000 to 4004. This ensures the correct description is printed up for each location.

I've made no attempt at text compression here, as the adventure isn't particularly large and getting it all to fit into the memory of the Commodore 64 wasn't a



What I usually do next is type in the map data, with possible directions of movement. Lines 5050 to 5058 contain this; four numbers for each location, which tell you which room a player can go to by moving north, south, east or west

problem. However, owners of other machines might like to tackle this problem. Perhaps the simplest way to tackle this is to use symbols instead of common words, and then use a program to check through each room description,

printing the full word instead of the symbol if the program finds it. For example you might use shifted T instead of the word *the*, since it frequently occurs. And not only by itself: words such as *rather*, *another*, and so on, all contain *the*.

Next comes the coding for the verbs, and checking what the player types in. Taking the latter first, take a look at lines 60000 onwards. This is the input routine, which makes sure that the player cannot escape from the program by pressing *eg* the cursor keys. Run/Stop and Restore have not been disabled, though they could be if you wanted to make the program foolproof.

The player is limited to 27 letters (line 60080 sees to that), and generally the routine checks for ASCII values of keys being pressed, enabling the player to correct any mistakes, and to press the Return key once happy about what has been typed in.

How do we analyse this? Well, in Basic we're obviously not going to approach the sophisticated analysers of people such as Melbourne House or Infocom, but we can go a reasonable way towards that.

Lines 390 to 412 control this part of the program.

With this routine we can handle sentences such as 'Go North and get key.' or 'Knock at house number 3,' for example. Look at the listing to figure out how it works (lots of string handling); the basics of it are a check on each character typed in, and building that

noun). The whole program revolves around VB, NO and CP.

New developments

Move on to entering the code for each of the verbs, starting with essentials such as *get*, *drop* and those handling movement. Now you can get on with testing the program, and adding other verbs as you go. Be prepared to change with new developments. I'm sure Conan Doyle changed *The Sign Of Four* a few times before it was published.

If you look at line 100 you'll see a SYS call (the machine code data is poked in by line 20000). This is a convenient way of handling program control, although if you're not using the Commodore 64 you may have problems. Essentially, it allows us to go to the program line whose number is given by adding 980 to the verb number times 20. So, if VB was equal to eight, we'd go to program line (980+8*20), ie line 1140. A computed GOTO for the Commodore 64.

The first verb is *open*, so if the player had typed in OPEN then VB would equal 1, and we'd go to line 1000. The second verb, UNLO (short of UNLOCK), was typed in we'd go to line 1020, and so on.

Opening doors

The verb *open* is a handy example of how it all works. Line 1000 checks to see what room the player is in; if they're not in any of the rooms given, there's nothing to open, so GOTO line 1019. Always try to structure your verb handling so that either the most likely, or the most

to the main part of the program. The next line simply goes to 1019 if they're in room 56, since there's nothing else to open there.

Line 1004: this checks to see if the player is in room 8; he's trying to open the window. That is, he's trying to open object number 20 and the window counter hasn't been set. If everything's okay, print the OPEN WINDOW message, set the variable, and add one to the variable CL. CL comes into play only at the start of the game, as the player is given a specific number of moves in which to find 12 CLUES. In the book, the police arrive fairly soon after you do, so we've attempted to reproduce that part here. Line 392 keeps an eye on how many moves have elapsed.

Line 1005: checks to see if the player is trying to open the door in any one of locations 1, 2 or 5, whereupon they are informed that the door is locked. Then, unless he's in the only other one where they can open anything (room 52), program control is sent off to line 1019 again.

And so it goes on, checking for objects and locations and variables before allowing the player to act. You will probably find that the first few versions of the program do not work correctly (checking your adventure is the most difficult part of all) and the version of *The Sign Of Four* that you're looking at now is the fifth or sixth. We apologise for any errors that might remain in it, but if Melbourne House can have Watson charging into the hallway at Baker Street while still inside a Hansom cab, we're in good company.

Good adventures are not difficult to write. They just take a lot of time and perseverance. If you've ever balked at taking up the challenge, why not give it a go now?

Try changing the listing, a little bit at a time, to get the feel of what's happening, and before you know it you'll have a totally different game.

For cassette users

Cassette users need to make minor changes to the program.

This affects the save and load routines when you wish to record your progress onto tape. As it stands, the program is designed to save the current game status onto disk, so you must make the following changes:

- Change line 1427 to read 1427 OPEN1,1,1,"SIGN DATA"
- Alter the PRINT#2 statements in lines 1428 to 1434 to become PRINT#1 statements
- Change the CLOSE2 statement in line 1435 to become CLOSE1; then alter line 1447 to read 1447 OPEN1,1,0,"SIGN DATA"
- Alter the INPUT#2 statements, lines 1448 to 1452, to become INPUT#1 statements.
- Change the CLOSE2 statement in line 1453 to become CLOSE1. Now you have a tape-based version.



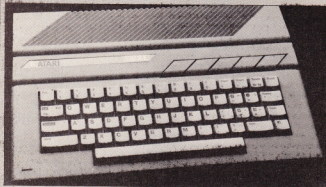
into a four-letter verb-noun format. The program then checks through every verb and noun that it knows; if this corresponds to what the player has typed in, we get a value for VB (the verb) and NO (the

unlikely, responses are dealt with at the beginning. Then program execution appears to be reasonably fast.

Line 1001: if the player is in room 56 and trying to open object 67, the chest, inform him that it's empty, and go back

XE UNDER EXAMINATION

More memory, better graphics and improved sound for less money, the 130XE is aimed to appeal to a mass market, says Stuart Cooke.



The smart design makes an asset out of the cooling grille.

If you were to ask the country's top microcomputer programmers which machine they thought was the best, the majority would say the Atari. Even those who are well known as Commodore 64 programmers would prefer to use the Atari if it was feasible.

Until now Atari's reputation for very highly-priced products and extremely over-priced software has put software houses off since there was no mass market to buy their wares. However, things are about to change. Atari has launched the 130XE personal computer with 128K RAM for a staggering £169.99.

With software houses such as US Gold importing US titles at realistic prices and Atari dropping its software prices, the machine looks set to go far.

First impressions

Despite its futuristic styling, the Atari 130XE is extremely reminiscent of the old Atari 800 computers. The main differences are fewer joystick ports, these are now on the side of the machine and have been cut from 4 to 2, and the function keys have been moved above the keyboard.

The cartridge port has been moved to the rear of the machine and there is only one. On the old Ataris two were needed because Basic was provided on a ROM cartridge. With the 130XE (and the earlier XL's) Basic is installed inside the machine on ROM.

The similarities to the older machines end with the actual layout of the

product — the 130XE is totally software compatible with the Atari 400/800 and XL range of machines. This means that there is a wide range of software already available, although in some cases it is quite pricey but this is changing.

Unfortunately the standard Atari peripheral connector has been used. Whether you want to use disk drives or a cassette tape, you will have to buy Atari's own; your old battery operated cassette player is no good at all. Even so, the fact that the standard Atari interface is used means that a large number of disk drives, printers and other peripherals are already available, so you won't have to wait for them to be developed.

In use

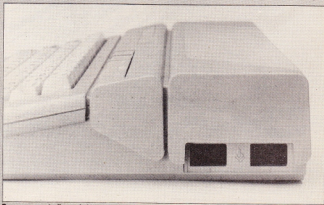
The first and probably most surprising thing you notice about the 130XE is that the expected 128K of RAM is not available for use. The machine behaves as if it was a 64K Atari, if you wish to use the extra memory you will need to refer to a two page section at the rear of the manual.

On many of the older Atari machines there was a fairly common problem with the graphics and sound. You could tune the TV to give you excellent pictures with very poor sound quality, or excellent sound but with very poor picture quality. This was most annoying when playing games because you often had to turn the sound right down when the background hiss became unbearable. This problem seems to have been cured on the 130XE and both picture and sound are of excellent quality, even on my cheap colour television.

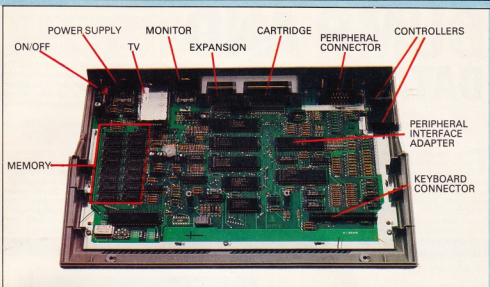
Documentation supplied with the machine can be described as both excellent and poor, depending who is looking at it. If you are a beginner who has never used a computer then it is fine. You are taken through most of the available commands at a steady pace with lots of little examples to type in so you can see the commands in action. Once you have gone through this, or if you are already past this stage, the manual is of little use.

Believe it or not, the Atari 130XE has eight sprites available for use. These are predefined graphics characters that can be placed anywhere on the screen and moved around with ease. It is even possible to move them under and over objects on the screen. Atari prefers to call these sprites Player Missiles.

You would expect such an important facility to be extremely well explained so that owners of the machine could use them with ease — and you'd be wrong. The facilities that these sprites offer are only mentioned within the example program section of the manual. The supporting text merely states: 'This program uses a technique called Player



Two games controller sockets are provided instead of the traditional four.



The centre of the circuit board is dominated by Atari custom chips.

Missile graphics to create a pink monster that moves across your screen; followed by a program of 18 lines, full of **POKES** to memory, with no comments.

The appendix that deals with the extra 64K of RAM states that the extra memory is usually transparent to the user and is accessed by a method known as bank switching. This means you can take a 16K section of memory and swap it with another section. The explanation is quite technical, and novice micro users would be well advised to stay clear of the extra 64K until they feel at home with the machine and understand the meaning of the words bit and byte.

The extra memory is, however, an exciting thing for experienced programmers. It can be used to store information for a database or spreadsheet. Games programmers will be able to produce arcade games with an extremely large number of screens, and adventure programmers should be able to write some very large adventures. But how long will we have to wait for the software that makes use of this superb facility?

In order to fully test out the compatibility of the new machine with the old Ataris, a number of pieces of software were tested. Software typed in from magazine listings worked without a hitch. Atari home computer cartridges and cassette software worked perfectly.

The machine is actually a joy to use; the keyboard has very little travel but is still reasonable to type on. The main problem is the very small carriage Return key and the unfortunate positioning of the Caps Lock key directly beneath it.

The keyboard layout is exactly the same as on the Atari 800 machines. This has probably been done to make the

machines totally compatible. It would have been nice if the cursor keys could have been moved though — you have to press the control key with the -, =, + and * keys.

The graphics facilities of the machine are extremely good: 16 graphics modes and 256 colours are available. There are 16 main colours and the other colours are obtained by adjusting the luminance of the colour. However, only five of the main colours can be used at any one time. Text is displayed as 40 columns × 25 lines and five different text modes are available. The maximum high resolution screen is 320 × 192.

Within the Basic there are commands to deal with most of the graphics and sound facilities of the machine, and of course colour is spelt the American way, **COLOR**. Having graphics commands resident in the machine is certainly one up on Atari's major competitor Commodore.

Verdict

The Atari 130XE should certainly be a winner. With 128K of RAM, superb graphics and sound facilities, a plethora of software already available and a very attractive price tag, other manufacturers must be getting worried.



The peripheral and cartridge ports use standard Atari add-ons.

SPECIFICATIONS

Software	Atari Basic, compatible with Atari 65XE and 800XL computers.
Processor	6502C, 1.79MHz.
RAM	128K.
ROM	24K.
Display	11 graphic modes, 256 colours, 320 × 192 highest resolution, 5 text modes, 40 × 25 text display.
Sound	4 voices, 3 1/2 octave range.
Keyboard	62 Keys, including 5 function keys.
Interfaces	Cartridge, TV, monitor, 2 controller ports, serial I/O connector.
Price	£169.99



DUMP AND DATA-MAKER

Just when you'd given up hope, Stephen Brunton comes to the rescue with two useful machine code utilities to help your programming on the Atmos.

These two short programs provide handy machine code utilities for the Oric Atmos, presented in the form of Basic programs that load the machine code into memory. The Basic can be deleted after loading.

The text screen dump is interrupt-driven, and so will execute whenever Ctrl P is pressed. It is assumed that the

printer does not add a line feed to a carriage return code. The ROM printer routine is used, and I have included the minor changes that should enable this routine to run on the Oric 1.

The second routine is an aid to constructing Basic programs that use machine code subroutines. When called this program will construct DATA state-

ments from a given area of memory, and these will be appended to any program already present.

The routine needs the address of the first memory location to be poked into location 0 and the address of the final location plus one to be poked into 2. The starting line number must also be poked into location 4. This should be greater than the last line of any current program, as the data is appended to the program.

The DATA statements will be numbered in increments of five, starting with the given line number. This routine allows any machine code subroutines to be entered using an assembler and, when working and tested, to be transferred easily to the Basic program. The DATA statements in my Basic program were constructed using this routine after I'd written it in assembler. As far as I'm aware the routine should work without modification on the Oric 1. ▀

Data-maker

```

10 REM*****
11 REM      "DATA MAKER"
12 REM
13 REM This program constructs data
14 REM statements from assembler.
15 REM It is totally relocatable.
16 REM and uses just under 200 bytes
17 REM of memory.
18 REM
19 REM Requires:
20 REM DOKE 0,start
21 REM DOKE 2,end
22 REM DOKE 4,line-no
23 REM
24 REM The data statements will be
25 REM at the end of any program
26 REM already present, so line-no
27 REM must be greater than the last
28 REM line already present.
29 REM The data statements will be
30 REM numbered in increments of 5,
31 REM starting with the given line.
32 REM
33 REM to use, enter the above DOKEs
34 REM and then CALL #9700
35 REM
36 REM      Steve Brunton.   March 85
37 REM
38 REM*****
100 HIMEM#9700:I=#9700
110 READ DTA
120 REPEAT
130 : POKE I,DTA
140 : I=I+1
150 : READ DTA
160 UNTIL DTA=-1
1800 DATA#5,#9C,#3B,#E9,#02,#85,#06,#A5,#9D,#E9,#0B,#85,#07,#A2,#0B,#A9
1805 DATA#02,#A5,#04,#91,#06,#A5,#05,#CB,#91,#06,#A9,#91,#CB,#91,#06,#A9
1810 DATA#23,#CB,#91,#06,#A1,#0B,#4B,#29,#FB,#4A,#4A,#4A,#4A,#C9,#0A,#90
1815 DATA#04,#69,#36,#90,#02,#09,#30,#CB,#91,#06,#6B,#29,#0F,#C9,#0A,#90
1820 DATA#04,#69,#36,#90,#02,#09,#30,#CB,#91,#06,#E6,#0B,#02,#E6,#01
1825 DATA#A5,#01,#C5,#03,#90,#06,#A5,#00,#C5,#02,#B0,#36,#CB,#A0,#B0,#07
1830 DATA#A9,#2C,#CB,#91,#06,#00,#B6,#CB,#A9,#00,#91,#06,#9B,#A0,#00,#A6
1835 DATA#07,#3B,#65,#06,#90,#01,#EB,#EA,#91,#06,#CB,#4B,#8A,#91,#06,#6B
1840 DATA#85,#06,#86,#07,#18,#A5,#04,#69,#05,#05,#04,#90,#8B,#E6,#05,#18
1845 DATA#90,#F9,#A9,#00,#CB,#91,#06,#CB,#91,#06,#CB,#91,#06,#B8,#9B,#A6
1850 DATA#07,#18,#65,#06,#90,#01,#EB,#EA,#A0,#00,#91,#06,#8A,#CB,#91,#06
1855 DATA#8B,#B1,#06,#18,#69,#02,#85,#9C,#CB,#B1,#06,#69,#0B,#85,#9D,#60
1860 DATA -1

```

Text screen dump

```

59990 REM*****
59991 REM TEXT SCREEN DUMP <ctr>P *
59992 REM
59993 REM Steve Brunton. March 85
59994 REM*****
59995 REM
60000 HIMEM #97A0: MEM=#97A0
60010 READ DTA:REPEAT
60020 :POKEHEM,DTA: MEM=MEM+1
60025 :TT=TT+DTA: READ DTA
60030 UNTIL DTA=-1
60035 IF TT<#2893 THENPRINT"ERROR IN DATA":END
60040 DOKE#24B,#97A0:POKE#24A,#4C
60100 DATA #B,#7B,#4B,#8A,#4B,#9B,#4B
60105 DATA #AD,#92,#C9,#A2,#DC,#A,#AD,#B,#2
60110 DATA #C9,#9D,#0B,#3,#2B,#CB,#97
60115 DATA#6B,#AB,#6B,#AA,#6B,#2B,#4B,#EA
60120 DATA #A2,#1C,#A9,#8B,#B5,#B,#A9
60125 DATA#B2,#B5,#1,#A0,#B,#B1,#B,#C9,#20
60130 DATA #B0,#2,#A9,#2B,#2B,#C1,#F5
60135 DATA #CB,#CB,#2B,#0B,#F0
60140 DATA #A8,#2B,#C1,#F5
60145 DATA #A9,#D,#2B,#C1,#F5
60150 DATA #18,#A5,#0B,#69,#2B,#85,#0
60155 DATA#90,#2,#E6,#1,#CA,#0B,#0B,#0B,#D4
60160 DATA #A9,#3B,#8B,#0B,#2,#60
60170 DATA -1
60200 REM
60210 REM For Oric-1 replace #C1,#F5
60220 REM in lines 60130,60140,60145
60230 REM with #7B,#F5
60240 REM and replace line 60040 with
60250 REM DOKE#231,#97A0:POKE#230,#4C
60260 REM

```

ALL TOGETHER NOW

Alan Turnbull lists some of the improved facilities of the QL's upgraded ROM — version JS. Among them are better error trapping and extra extensibility with systems variables. JS brings all the special tables together.

Sunclair Research has developed a new version of the QL's ROM, which it has called JS. It follows on from AH and JM, as well as the earliest FB and PM releases which should have been replaced in a recall operation. Version JS should be available in QLs in the shops soon.

The new ROM comes with QDOS version 1.10 (see versions 1.02 and 1.03) and the JS SuperBasic provides 25 extra keywords to allow error trapping in conjunction with WHEN and ERROR which have been implemented at last.

Also included in the new release of the QL's firmware is extra extensibility in the form of two new system variables which point to special tables. In previous releases of the QL's firmware, these tables were scattered throughout the ROM — this new ROM brings them all together.

National character set

One of these system variable points to a table which holds the national character set — the characters to be output on receipt of each code in the range 0-255. For example, in the UK we expect the hexadecimal code \$41 to produce the ASCII character A. However, in Greece QL users would expect \$41 to print the Greek letter alpha. Altering this system variable to point to another table would allow people of different nationalities to use the QL easily.

The other system variable points to a table of messages used on the QL. These messages include the rather terse error reports which could do with being extended.

The national character set pointer is at \$28146 and the message table pointer follows it at \$2814A. Each table has a special format.

The long word at \$28146 points to the national character set table which is in the following format:

```
$4AFB special table identifier
<word>offset of first character from table start
<word>offset of last character from table start
<bytes>characters corresponding to codes
```

The message table (pointed to by \$2814A) is in the following format:

```
$4AFB special table identifier;
```

```
<word>offset of first message from table start
<word>offset of last message from table start
<word>character count for first error report
<bytes>characters making up first error report
<word>character count for last error report
<bytes>characters making up last error report
<word> <bytes> for At line, sectors, monitor/TV, copyright, during WHEN and PROC/PN cleared messages;
<bytes>characters for days of week
<bytes>characters for months of year.
```

All messages are word aligned by filling to the right with zeroes.

Listing 1 shows an assembly listing which provides an extension to the current message table. It can be linked into the QL system. To use the listing, take the following steps:

- 1 Type in and assemble the listing and store the code generated on backing store (about 1K long).
- 2 Reserve some QL memory with LET A=RESERVE(1024).
- 3 Get the data off backing store and into memory with, for example, LBYTES MOV2L,MESSAGES,A.
- 4 POKE.L 164170,A.

If you have done everything correctly, all subsequent messages should read as in Listing 1.

I hope this article proves of use to new 'JS' QL owners who may not have known that such facilities were available on their machines.

Listing 1

```
00100 * New S.L. messages table for VER# JS
00101 *
00120 * COPYRIGHT (c) March 1985, Alan Turnbull
00130 *
00140 *
00150 START: DC.W $4AFB
00160 DC.W MESS01-START
00170 DC.W MESS02-START
00180 DC.W MESS03-START
00190 DC.W MESS04-START
00200 DC.W MESS05-START
00210 DC.W MESS06-START
00220 DC.W MESS07-START
00230 DC.W MESS08-START
00240 DC.W MESS09-START
00250 DC.W MESS10-START
00260 DC.W MESS11-START
00270 DC.W MESS12-START
00280 DC.W MESS13-START
00290 DC.W MESS14-START
00300 DC.W MESS15-START
00310 DC.W MESS16-START
00320 DC.W MESS17-START
00330 DC.W MESS18-START
00340 DC.W MESS19-START
00350 DC.W MESS20-START
00360 DC.W MESS21-START
00370 DC.W MESS22-START
00380 DC.W MESS23-START
00390 DC.W MESS24-START
00400 DC.W MESS25-START
00410 DC.W MESS26-START
00420 DC.W MESS27-START
00430 DC.W MESS28-START
00440 DC.W MESS29-START
00450 MESS01: DC.W 24
00460 DC.B 'operation not completed',10
00470 MESS02: DC.W 18
00480 DC.B 'DOS error return',10
00490 MESS03: DC.W 20
00500 DC.B 'no more memory left',10
00510 MESS04: DC.W 19
00520 DC.B 'value out of range',10,0
00530 MESS05: DC.W 26
00540 DC.B 'no more buffer space left',10
00550 MESS06: DC.W 28
00560 DC.B 'cannot find or open channel',10
00570 MESS07: DC.W 48
00580 DC.B 'cannot find file system, device, medium, file or identifier',10
00590 MESS08: DC.W 20
00600 DC.B 'file already exists',10
00610 MESS09: DC.W 30
00620 DC.B 'file or device already in use',10
00630 MESS10: DC.W 28
00640 DC.B 'end of file or data reached',10
00650 MESS11: DC.W 17
00660 DC.B 'file device full',10,0
00670 MESS12: DC.W 50
00680 DC.B 'cannot recognise name or name used out of context',10
00690 MESS13: DC.W 22
00700 DC.B 'MS-2-C parity error',10
00710 MESS14: DC.W 39
00720 DC.B 'unexpected format of file device failure',10,0
00730 MESS15: DC.W 71
00740 DC.B 'error in parameter list or attempting to read from a write-only device',10,0
00750 MESS16: DC.W 33
00760 DC.B 'faulty or changed storage medium',10,0
00770 MESS17: DC.W 20
00780 DC.B 'error in expression',10
00790 MESS18: DC.W 20
00800 DC.B 'arithmetic overflow',10
00810 MESS19: DC.W 34
00820 DC.B 'feature not currently implemented',10
00830 MESS20: DC.W 37
00840 DC.B 'attempting to write to a shared file',10,0
00850 MESS21: DC.W 32
00860 DC.B 'syntax error in SuperBASIC line',10
00870 MESS22: DC.W 14
00880 DC.B 'Error at line'
00890 MESS23: DC.W 22
00900 DC.B 'free/maxium sectors',10
00910 MESS24: DC.W 21
00920 DC.B 'F1...Monitor',10,'F2...TV',10,0
00930 MESS25: DC.W 30
00940 DC.B '(c) 1985 Sunclair Research Ltd'
00950 MESS26: DC.W 23
00960 DC.B 'during WHEN processing',10,0
00970 MESS27: DC.W 27
00980 DC.B 'PROCEDURE/FUNCTION cleared',10,0
00990 MESS28: DC.B 'SunMonUsedInFrntSet',0
01000 MESS29: DC.B 'JanFebMarAprMayJunJulAugSepOctNov Dec',0
```



TROPICAL TANGLE

Bob Chappell, forced to bail out in the Bermuda Triangle, finds himself lost in paradise — and the king hates tourists!

I've started in some weird and wonderful places but never before have I begun an adventure stuck up a tree in a mangrove swamp. The Austen clan from Level 9 Computing had struck again.

Their latest text and graphics adventure, *Emerald Isle*, is available for a wide number of home computers. If you've got an Amstrad, Commodore 64, MSX or Spectrum, the game includes some 240 pictures and about 30K of text. BBC owners should rejoice — their version also has the same number of pictures but a sacrifice comes in the form of reduced text. Atari, Enterprise and Memotech owners get a plain text only version. All versions cost £6.95.

The price is lower than other Level 9 games because *Emerald Isle* is somewhat simpler and easier to solve than the rest of their range. But don't get the idea it's a walkover, because it isn't.

Up a gum tree

So what was I doing perched in a tree?

Well, a few minutes earlier I had been piloting a light aircraft over a tropical island paradise. But, as adventurer's luck would have it, not only had Level 9 set this emerald island in the middle of an azure sea, they had also placed it slap bang in the middle of the dreaded Bermuda Triangle. The parachute tangled round the branches beside me made it clear that I had just bailed out.

The objective of the adventure is not just to find the usual cartload of treasures but to try and escape from the island. My immediate problem was to untangle myself from the chute and then climb down. Having managed to get my feet safely back on terra firma, I was instantly on the move — straight round in circles, as it happened.

Lay a trail, thought I. Hah! — Level 9 had anticipated that old trick. Persistence paid off and ere long I was in the centre of a strange city, set high among the trees.

The motto of any seasoned adventurer must ever be 'Lay

thy mitts on everything thou canst — thou never knowest when it's going to come in handy, like'.

Just like Del Boy and Rodney, I followed this illiterate aphorism to the letter and was soon collecting enough objects to start a jumble sale.

Among the bric-a-brac I had amassed within a very short time were an ermine robe, a piece of silk, a pot of glue, coins of all values, a railway ticket and an instruction manual (not about opening junk shops). A stopped clock, an invisible barrier and some locked doors were but a few of the first puzzles to give me pause for thought. And where was that darn lamp?

Characters appearing quite early in the game included a gullible guard, a sad seamstress and a snuffy butler. I especially liked the testy king: 'Tourists! Will I never get any peace?'

Emerald Isle has fast if simple graphics which can be switched on and off by a command. As with all Level 9 adventures, you get an immediate response to all text input. It is an enjoyable, fast-moving adventure with plenty to keep the fans happy until the next Level 9 fantasy appears.

Golden oldie

One of the all-time great

adventures makes a welcome re-appearance on the Commodore 64. *Colossal Cave Adventure* (Duckworth, £7.95) is the original Crowther and Woods mainframe adventure and follows the original layout quite faithfully.

To be fair, other companies have had versions of this favourite available for some time now. Level 9 (*Colossal Adventure* — unquestionably the best of all the adaptations) and Melbourne House (*Classic Adventure*) are but two.

The adventure is supplied on cassette and the entire program loads into memory. Since no compression techniques seem to have been used, there has been some curtailment of the fulsome text in order to squeeze the game into memory. *Colossal Cave Adventure* was programmed for the Commodore 64 by Peter Gerrard who is already well-known for his series of books on exploring adventures.

Past and present owners of the aged Commodore Pet micro will have fond memories of this adventure. It was originally produced for the Pet, on disk, by Commodore guru Jim Butterfield.

The famous plot involves a trip around a massive cave complex and appears to have the familiar classic puzzles, traps and mazes. Adventure

buffs are likely to come over all nostalgic when I mention such beloved features as the axe-throwing dwarves, the black rod, the nervous bird, Plugh and Xyzzy.

Every adventurer worthy of the name should have at least one version of the Crowther and Woods masterpiece in their collection. This one is a competent translation and should certainly provide a good deal of pleasure.

Dungeonade

Thinking to curry flavour by gleefully reporting the misfortunes of others, an apprentice but has whispered in the Dungeon Master's ear that many wretches are unable to progress beyond the first half of *Castle of Terror* (Melbourne House). To them comes the Dungeon Master's benevolent helping hand while to the malodorous but has come intimate knowledge of a more culinary meaning of the word curry.

● Old man not very talkative? NAM OT ELA EVIG NEHT ELA YUB

● Can't wedge open the drawbridge? First: LLIM DNOCES EHT OT NNI KCUD MORF-TSAE OG, then GNURSOOL TEG NEHT REDDAL ENIMAXE, and finally (GNUR) NIP TRESNI EGDIBWARD TA.



COMMODORE 64

CAULDRON

STAR



STAR GAME
Cauldron is one of the best 64 games I've seen this year. But it's very difficult. Software produced by a compulsive, graphically tasty little number that should be a winner.

The aim of the game is to collect ingredients to make a magic potion. Once collected they must be returned to the bag, a cottage and mixed in the cauldron of the title. As in many games these days, the instructions are slightly obscure. Not quite. Ultimate obscurantism, but enlighten verses.

The bag in question is a delightfully animated and straightforward green-haired witch. There are hats, sea-girls and Grimms. You can make potions the alchemists on her homestead, or send for a stroll. Hanging in the fire is the fixed stars and a cloud cast

moon, adding to the tremendous atmosphere created by the accompanying music.

Airborne control is very tricky and takes a long time to master because of the momentum. Once you've built up speed it takes an age to slow down, so fast manoeuvres are out of the question. This makes dealing with the various flying hazards doubly problematic. Acceleration is slow and there's a



peculiar feature whereby you move a fraction in the opposite direction to the way you're facing before picking up speed. There are hats, sea-girls and gnomes on the surface level where you start. The gnomes are a delight. You'll spend ages battling with them just to move at the way they're done, rather than getting on with the

are innocent erilian vehicles and killing them loses you points. The Road Lord is hollowed so has to be reannointed; notice Switch Blade, which carries buzz-saw hobs.

Strike a huge motorcycle and he goes into a slaking spin before crashing.

The road is strewn on a central black strip, flanked by a lethal hard-shoulder. Behind this is green countryside dotted with trees, the colours changing as you progress. The road's not straight. Bends, detours and forks appear, forcing you to slow down to cope with the driving conditions.

Last long enough and the Weapons Van appears again, with a kill on its roof. This tells what kit you can pick up. If each object you acquire you seem to set off a temporary unleash a monster. I soon found my resistance to attacks measured in hitpoints running low.



There are three levels of difficulty and at the lowest you are resurrected several times. Even so, it took me just five minutes to expire permanently the first time I played. And that's when the problems really start. The program is pro-

lack in hand, splitting plants and fireball hurling volucroses. Contact with any of these drains you resources alarmingly rapidly, and once your magic factor reaches zero, pernit that's another life done.

The dying hag routine brings out the attention to detail—the hag loses any upward acceleration and slows down, and as soon as any obstruction is met she spins end over end, quickly coming to a rest. And it's there that the next hag appears. Fortunately there's a generous nine lives granted at the start, so you get a fair crack at the game each time round.

The hag can cast (ie fire) spells to eliminate opposition, but the flying contrail takes a long time to master. The trick, as in *Ice Palace*, is to press fire and then move the stick in the direction you want to shoot.

Having found one or more coloured keys on the surface level, you can head next to the doors and gain entrance to the underground domain. If you thought the first set of hazards

you can manoeuvre behind it and up the ramp that it will drop. Back on the road you can select from the weapons you're carrying. You'll see cockles to take care of the bomb-dropping



chopper that hovers overhead, while you can drop all slices that cause other traffic to skid off the road.

Occasionally detours lead to waterways. Pass through a bottleneck and you're dumped ylded on a double-sided disk. To load you have to boot up the first disk, then flip over and make a copy of the second side. (The Master Character disk. The game then runs off your copy. This wouldn't be too bad if you could continue playing several times on one copy, but you have to make a new copy every time you lose a game.

The copying process takes more than two minutes with two disk drives, and it takes if you've got only one. Beginners could find themselves following up the remainder of play with an even longer spell of copying.

The graphics are average, which is less than I would expect from Potpourri. The graphics, with over 200 rooms and passages I suspect there wasn't

was hard, you suddenly find yourself in one of four rather nasty platform games.

Here you'll come across more bats and fireballs as well as ribcages and gaping skulls. Down in the planet's interior you must hop from level to level, dodging the fireballs and looking to collect ingredients for your spell. But the game isn't as simple as it might sound at this stage. To collect some of the ingredients you'll need special containers, and you can only carry two at a time.

If you manage to collect all the ingredients to make your spell—and I'm nowhere near that yet—you can make your way to the Pumping's hide-away in one of the caverns and get stuck into the final showdown.

There's an awful lot to this game and the graphics and action are superb. The starting music is great and, while it's not sustained, the sound effects are good throughout. *Cauldron* just has to be a chart-topper.

Bryan Skinner
 Price £7.99 Publisher Palace Software, 01-278 0751

SPECTRUM

SPY HUNTER

Back the white DB5 out of Q's Weeps. Van onto the hot tarman. Let the van pull away, then stand down on the grass. Ease' up behind on a red Switch Blade and let him have it up the exhaust pipe from your double-barrelled machine guns.

Spy Hunter is straight James Bond stuff, the official version of Bally Midway's first arcade hit. There are two phases to the game, but they're very similar. In the first phase you're in the air and the aim is simply to better the current high-score.

Points are scored for rubbing out enemy agents. But don't fire out enemy agents. But don't fire at everything you see — some

APPLE II

SWORD OF KADASH

Combining adventure epics with arcade action seems to be the fashion these days, and *Sword of Kadash* falls neatly into the slot of animated adventure.

According to the inlay you have been captured by fierce nomads in the Persian desert who have given you a rather limited chance: enter the fortress of the Dragon and bring back the sword of Kadash, or die.

In your quest for the sword you wander through the maze-like corridors of the fortress, fighting off gnomes, goblins and other nasties and collecting treasures and weaponry. With



Rating 7/10
 Price £39.95
 Publisher Vic Gold
 021-359 3020

enough memory available in 48K to go into too much detail. The animation is cute if unimpressive and the joystick control is good.

The game offers a lot of variety and can get very tricky at level three, but the pace is too slow for arcade fanatics and the puzzles aren't very demanding on the intellect. They consist mainly of finding hidden puzzle walls until a hole appears, then solving by bashing against brick walls until a hole appears.

Good fun for a while, but not good value.

Rating 7/10

Price \$34.95

Publisher Potpourri
 Software, 890 4th
 Avenue, PO Box
 3111, Geneva, IL
 60134 (312) 232
 1884

SPECTRUM

KISSIN' KOUSINS

English Software has built up an enviable reputation for producing a series of games with high-quality graphics and good presentation.

Kissin' Kousins certainly starts off well. It comes with a colourful cover and decent loading instructions. Once loaded (a surprisingly long process for a BBC game) there's a pretty, animated header and a nicely disintegrating title screen when you tap the space bar to start the game.

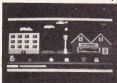
KK is a variation of the

Hunchback or Mr Punch storyline. To reach your 'gal' on the other side you have to run and jump over obstacles, avoiding the bombs from passing bi-planes, kangaroos etc.

The first set of objects, hydrants and dustbins, is largely static. After this, though, you encounter the giant caterpillars, which hoop their way back and forth across the screen. Then it's more hydrants, a trampoline and an overgrown wallaby. Screen four introduces the gogglers, and there are bats, rubber frogs and toadstools later on.

You may have gathered I'm not over-impressed with it. The

game is uninspired and the screen's use limited. Apart from the bi-plane, and the things which jump high, all the action takes place in a small strip,



two-thirds of the way down the screen.

The neatly drawn background, which scrolls smoothly between screens, is just that. It

pays no active part in the game. Completing a screen is just a question of timing, as many of the creatures repeat their movements each time you come to them. While the idea of the Country and Western setting is a good one, the old game hasn't been sufficiently revamped.

The cassette does have the advantage of offering the Electron version on the other side. But cheap as it is, it's not worth it.

Simon Williams



Rating 7/10
Price £4.95
Publisher English Software
061-835 1358

AMSTRAD

DEATHSTAR INTERCEPTOR

Death Star Interceptor is a little out of date — it's the 'official' version of the final scenes of *Star Wars*, and was first released for the Commodore 64. You know the theme — fly to the planet *Deathstar*, down a trench on its surface and loose off a direct hit on the reactor port. But despite the age of the ideas, *Deathstar* is pretty good.

There are three screens — well just. The first is a 'fly

through the portal' affair; dead simple after a few tries, so it doesn't really count. The second appealed most — a good shoot-em-up. Here you



can see the *Deathstar* at the top left of the screen, in the distance, planet Earth off to the right. Waves of alien fight-

ers swirl from the *Deathstar's* surface and snake towards you. Busy with dodging from side to side, raking the enemy hordes with laser fire, you may not notice the *Deathstar* edging closer.

The animation of the fighters is superb. They're straight *Star Wars* craft, large vertical side foils etc, but as they turn and bank the perspective transformation is almost cartoon quality.

Survive your trip to the planet and it's down the trench. Sure, it's been done before, but this one's no piece of cake, even if the graphics

are limited. Besides, it's nice to get two games in one.

The trench is deep blue with various devices set in the walls. Some of these spit lethal bullets, or set up deadly rays three-quarters of the way across the trench.

Deathstar Interceptor is good, despite being dated. The graphics have been given a lot of attention, it's worth a close encounter.

Bryan Skinner



Rating 7/10
Price £7.95
Publisher System 3
01-587 0873

AMSTRAD

JET-BOOT JACK

Originally for the Spectrum and Commodore 64, Jack has made the transition to the Amstrad very ably — no doubt by using the famed power of his jet-boots.

Jet-Boot Jack is a platform game of sorts, but with a rather different scenario. The space-age jogger has to empty each screen of the musical notes suspended at head-height along the five levels of platforms.

As well as headbanging the

notes, Jack can recharge his boots by knocking into the vinyl pods, but the outcrops of solid rock and assorted weirdos hanging from the ceilings should be avoided. Even experienced nutters have to draw the line somewhere.

To move from one level to the next, Jack slides into one of the paternoster-style elevators which connect the platforms. When he is in full flight he can jump the gap left behind a moving lift but should be stop in the gap or run into the lift itself, he loses a life.

There are several neat extra features. You can restart in the

screen in which you expired, you can jump up and down on top of a wierdo until it loosens its grip and drops to the floor and you get a bonus for ducking



under the vinyl pods rather than taking fuel from them.

Skill modes govern the number of weirdos and the amount

of fuel available on each screen, and there's a set of demonstration screens if you want to sit back and rest. The jolly little tunes must be designed to demote the unwary.

Even though it's another conversion, it's worth having. But when a software houses going to start writing in earnest for the Amstrad? There are more than 200,000 in the UK crying out for original games.

Simon Williams



Rating 7/10
Price £8.95 Publisher English Software
061-835 1358

AMSTRAD

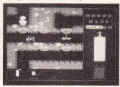
DEATH PIT

Tunnels, ladders and monsters — that's what this game offers, but don't get excited. It's an anti-climax after Durell's superb *Combat Lynx*.

You start off above ground, a chunky, helmeted figure carrying a shovel. Move left or right and you come across a tent or Land Rover. These are red herrings. The only way into the game is via the single downward set of ladders.

Underground you'll find a pretty standard scenario of more ladders linked by tunnels. You'll also be struck by the lack of variation and action. You're

supposed to wander about, gathering up gold bars, with the aim of amassing a fortune. There's a gem somewhere and the game ends when you take it



back to the tent, so you're advised to leave doing that until last.

The shovel's not for digging — it's for bashing nasties intent on preventing your fortune hunting. Use the T key (or fire)

to collect gold, or the space bar to select a carried item for use.

One of the worst faults is that screens don't carry across from one to another. If you're trucking down a ladder and a deadly scorpion waddles up towards you, just nip up to the screen above, then duck down and it'll have disappeared. This makes for a boring gameplay — it's too easy to stay out of trouble.

Death Pit lacks variation — all you have to do is troll about, dodging or bashing nasties and picking up gold bars. Flooded tunnels and a declining battery merely complicate the rules, but not the play. The choice of colours is odd, too — khaki-green bats on khaki-green steps are hard to pick out.

A game like this could and should have incorporated caverns among the passageways, perhaps some platform element, and a greater variety of hazards. The software sprites show promise, but it's just not realised.

All in all, *Death Pit* is a disappointment. And why do so many software houses insist on converting Spectrum and Commodore 64 games for the Amstrad? Why are there so few original games for the machine?

Bryan Skinner



Rating 6/10
Price £8.95
Publisher Durell Software
0823-54489

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SPECTRUM

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DUCKWORTH ADVENTURES

COLLOSSAL CAVE ADVENTURE

by Peter Gerrard

The original and best mainframe adventure, now available for the Amstrad and Commodore 64. Unlike other versions, this game follows the original layout, complete with all the intriguing traps and bewildering mazes, not to mention the Troll, the Dragon, the Pirate or the mysterious shadowy figure. You can't call yourself an adventurer until you have conquered this mammoth quest! As a concession to the fair-hearted, you are allowed to resurrect yourself twice. £7.95

ISLAND ADVENTURE

by Peter Gerrard

The setting for this fascinating adventure game for the Commodore 64 is a desert island on which you are stranded. Try to find your way off the island, avoiding monsters and other hostile inhabitants and collecting treasures. There is an option to save the current game status on tape. The game will accept a wide variety of words and is originally responsive. £7.95

MOUNTAIN PALACE ADVENTURE

by John D. Ryan

This devious adventure for the Amstrad and Commodore 64 is set in a long-lost palace in a distant land. You have heard rumours of the vast wealth to be gained by anyone brave enough to enter the palace. Unfortunately, the task turns out to be more difficult than you imagined, as the palace has some sinister inhabitants. Even the palace seems to have a mind of its own! There is an option to save your progress on tape at any time. £7.95

CASTLE DRACULA

by Ray Davies

Available for the Amstrad, BBC 31K and the Commodore 64, this game starts in a deserted village, overshadowed by Dracula's sinister castle. Your mission is to enter the castle and solve the riddle of a well prepared, stake. There are many useful objects to be found along the way, and from time to time the program can be persuaded to give you hints. There are 100 locations to explore and you have the option to save your progress on tape at any time. £7.95

Write in for a descriptive catalogue (with details of cassettes).



DUCKWORTH
The Old Piano Factory, 43 Gloucester Crescent, London NW1 7DY
Tel: 01-485 3484

QC ON TRIAL

GST has chipped in with a C compiler for the QL, called QC. It implements a subset of C, says Leon Heller.

When the QL was launched, Sinclair promised a C compiler. But the official Sinclair product has not yet materialised, and GST, the Cambridge company which developed the 68K OS operating system for the QL, has now brought out its own — it's a familiar story.

Rather than implement an all singing, all dancing, full C compiler, GST took the source code of the Small C 8080 Z80 compiler, originally published in Dr Dobbs' *Journal of Computer Calisthenics and Orthodontics*, and modified it to run on the QL to produce 68000/68008 code.

The result, QC, is a compiler that implements a subset of the C language as described in the C programmer's bible, *The C Programming Language*, by Kernighan and Ritchie. The main omissions are floating point, structures and multi-dimensional arrays.

First impressions

QC comes on two Microdrive cartridges with two blank cartridges provided for backup. An A5 ring binder contains the 73-page user manual, supplemented by a book on C (*A Book on C* by R Berry and B Meakins).

What is C?

For those readers not already addicted to C, it is a relatively simple expressive general-purpose programming language which allows the programmer to produce concise, highly structured source code. This compiles to compact, fast machine code. C is ideally suited to systems programming — writing operating systems, editors and compilers — but it also used for applications programming. It is one of the most portable languages as C programs written for one machine usually run on another with few, if any, changes. QC programs which don't use any features specific to the QL should run on most other machines with a C compiler. Lots of public-domain software written in C is available as source code from the C Users Group and the CP/M Users Group software libraries.

One cartridge (QC1) contains the C compiler, assembler, the standard Sinclair linker, a linker control file, a SuperBasic program to drive the compiler, assembler and linker, and a clone program. The second cartridge (QC2) contains two library files, a standard I/O header file, a sample program, and a clone program.

The package runs on a standard QL, but is much easier to use if you have the QL Toolkit, due to the implementation of pipes, which means the output of one program can be used as input to another without needing temporary files. There's no text editor, but most users probably have one already. I have been using the Metacomco editor; masochists could even use Quill.

In use

QC is written in QC, by the way and, like most C compilers running on micros, compiles to assembly language. This is first assembled, then linked with a library to produce a program which can be EXECed in the usual manner. A comprehensive library is provided, which as well as usual functions for input/output, opening files etc. also includes many features available in SuperBasic, such as sound generation, windowing and string handling. Direct access to QDOS functions is provided, and 'in-line' assembly language may be employed using the #asm and #endasm directives.

Assuming you have your program residing in source code form (a file called "fred.c" on cartridge QC2 in drive 2, with cartridge QC1 in drive 1, you compile the source by typing "exec.w mdv1-qc" to boot QC. When prompted for a command line, you just type "mdv2.fred", and the program is translated into an assembly language file called "fred.asm", on drive 2. This is assembled by typing "exec.w mdv1.qasm", followed by "mdv2.fred", when a command line is requested.

The relocatable binary file produced by the assembler, "fred.rel", must now be linked with the runtime library. This is done by first typing "exec.w mdv1.link". The linker requests a command line, and "mdv2.fred mdv1.qc.link -no-list" produces a file called "fred.bin" on drive 2, which may then be executed with "exec" or "exec.w".

The process can be menu-driven using a SuperBasic program called "compile", supplied as part of the package.

QC supports separate compilation: functions may be compiled separately and linked with the main program to create your own function libraries.

Error messages given by the compiler and assembler are informative, but the same cannot be said of the linker. This merely outputs "undefined symbols" when it comes across an unresolved reference, necessitating close examination of the optional linker listing file, which can be rather large.

A typical program

This is part of a program which emulates a (very) dumb terminal, which illustrates some features of QC.

```
#include <stdio.h>
define ESCAPE 27
int *chan, fd;
main()
{
  int c;
  baud(300);
  chan = fopen("ser2er", "w");
  fd = *chan;
  if (fd == 0)
    puts("Serial I/O open error");
  exit(0);
}
while (1)
{
  c = serin();
  if (c != 0)
    c = c & 127;
    putchar(c);
    fflush (std out);
  }
  c = poll (0);
  if (c != 0)
    if (c == ESCAPE) exit (0);
    serout(c);
  }
}
serout(c)
int c;
int regptr[8];
regptr[0] = 5;
regptr[1] = c & 127;
regptr[3] = -1;
regptr[4] = fd;
trap3(regptr);
}
serin()
{
  int regptr[8];
  regptr[0] = 0;
  regptr[3] = 0;
  regptr[4] = fd;
  trap3(regptr);
  if (regptr[0] < 0) return (0);
  regptr[0] = 1;
  regptr[1] = 0;
  regptr[3] = -1;
  regptr[4] = fd;
  trap3(regptr);
  return(regptr[1]);
}
}
```

Verdict

QC lacks some of the features of a full C compiler, but it can be used for serious work and is ideal for learning the language. It makes excellent use of the QL's unique features. █

REPORT CARD: 1 TO 5

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

Name QC compiler Price £59.99 Application Language compiler Supplier GST Computer Systems, 91 High Street, Longstanton, Cambridge CB4 5BS.

TURBO CHARGER

With Z80 card plugged in, David Janda savours the pace — and the price — of the Turbo Pascal compiler version 2.0

```

1,3 : integer;
write(' test');

procedure setmode(var a : byte);
begin
write(chr(22),chr(a));
end;

procedure plot (var bx : byte; ay : integer; ay : integer);
write(chr(22));
write(chr(22),chr(ay mod 256),chr(ay div 256),
chr(ay mod 256),chr(ay div 256));
end;

begin
writeln('T.C.H. ');
readln(x);
a := 0; setmode(a);
x := x + y * 8;
plot(x,a);
a := 1;
repeat
writeln(x,y);
plot(x,y);
until y = 8;
a := 2;
setmode(a);
end;
end.

```

```

Logged drive: B
Host file:
Host file:
Edit Compile Run Save
Alt+F5 Alt+F6 Alt+F7 Alt+F8
Alt+F9 Alt+F10 Alt+F11 Alt+F12
Test: 8 bytes (0020-0027)
Free: 2842 bytes (0028-7000)

```

Fast acting relief — Turbo Pascal shows what it's made of.

Just two months after unwrapping a copy of *Turbo Pascal I* can see why it received such a good press in the US. It's fast, packed with features and very cheap.

The package, available for micros running CP/M-80 and MS/PCDOS, lets you edit, run and fine-tune programs which can then be run stand-alone, ie without the compiler in main memory. At £60 you might think there's a catch, but — take it from me — there isn't.

I ran version 2.0 on a BBC Model B fitted with the Torch Z80 card. There is a version for the Acorn Z80 second processor, so specify which Z80 card you've got when ordering.

Features

Entering 'TURBO' at the keyboard invokes a menu with several options. From this command level it is possible to edit, run, compile, save and load to disk. On-screen information includes the name of the logged-on disk and byte counts for text held in memory, as well as memory remaining.

Choosing 'O' from the menu displays some compiler options, which allow you to compile to memory which is the default, or to disk in the form of a '.COM' file. Sub-programs are easy to manipulate, and the 'H' option saves program code to disk without the Pascal library. This is used when you have a main file

(.COM) that calls sub-programs with the extension '.CHN'.

Turbo Pascal has numerous extensions, including absolute address variables; bit/byte manipulation; direct access to memory and data ports; dynamic strings; in-line machine code generation; program chaining with common variables; type conversion function and much more.

A string type is one of the extensions to standard Pascal. A string can vary in length, but it is necessary to declare its maximum length when defined. A number of predefined procedures and functions to manipulate strings are provided.

File handling is also enhanced — you simply assign a file name to a variable. Random access is catered for and, as with strings, a number of procedures and functions are available for file handling.

The overlay system is among the best of all these facilities. This feature allows you to create programs that would not normally fit into memory at the same time. Instead, segments are loaded into RAM at run-time in the same area of memory. Overlays may be nested, but as they occupy the same area in memory they cannot call other overlays or be

Documentation

The reference manual is excellent. The 300-odd pages contain chapters cover-

ing the Turbo implementation, editor, file handling and so on. It looks a little daunting at first, but this is mainly because versions for all the operating systems are covered.

The manual can be treated as a reference work and, finding your way round is simplified with 12 pages of contents. The variety of typefaces proved to be a great benefit and, all in all, the manual was even pleasant to read.

Installation

I backed up the master disk and ran the terminal configuration program. There are 25 terminal types pre-listed and I was glad to see one of the Torch. Existing terminal types can be modified and, if your terminal is not listed, a series of questions allow you to create a file with your terminal's characteristics.

The configurator also allows the user to customise the editor commands to their own liking. Once done, the file with the terminal characteristics is automatically saved to disk.

IBM owners may be interested to know that *Turbo Pascal* supports colour and graphics for 80x25 or 40x25 text screens.

In use

Any *Wordstar* user will have no problems adapting to the sophisticated screen editor provided. All the common Ctrl sequences are used, as well as some new ones. *Wordstar* fanatics will be glad to learn that *Turbo Pascal* accepts source produced with no problems.

Turbo Pascal is fast — exceptionally fast. This applies not only to execution times for object code, but the whole compilation process too.

I found the additions to standard Pascal far outweighed the omissions. A number of Pascal programmers I have spoken to agree.

As far as faults are concerned I really don't have any to report; it's that good.

Verdict

Great software, good value for money — get it.

REPORT CARD: 1 TO 5

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

Name Turbo Pascal V2.0 Systems CP/M80/86, MSDOS, PCDOS Availability BBC and Torch versions, available from Altor Computer Software, Unit 11a, The Anderson Centre, Glasgow G2 7PH. Tel: 041-226 4211 (versions for other machines can be obtained at selected dealers) Price £63.19 (inc VAT & P&P) User groups Turbo Pascal User Group, c/o Dr J Maher, School of Chemistry, University of Bristol.

Amstrad

Amstrad games: Codename MAT, Football Manager, Fruit Machine, Harrier Attack, Manic Miner, Roland Caves, Star Commander, £5 each. Tel: 0625-529036 after 6pm.

Amstrad, Codename MAT, Er & Bert, Fruity Frog, Ghoulia, Pajamarama, Star Trek, Football Manager, Punchy-3D Invaders, Harrier Attack, Roland On Ropes, sell 24 each. Tel: 051-924-2503.

Amstrad HiSoft Dupac incorporates, editor, assembler, disassembler, monitor. Excellent condition £15. Codename MAT, Master Chess, hardly used £4 each. Tel: 041-632-2020. Bernard.

Amstrad software £3 each. Contact James on Medway 0634-250644 (after 4pm).

Amstrad printer, listing paper, Amstrad processor assembler, di assembler firmware specification Home Budget. £170 the lot. Tel: 080-485-1225.

Amstrad CPC 464 system, modulator, books, joystick, cover, clubs, Basic Tutor etc. £200-£500 software. £289 the lot. Local enquiries welcome (Glasgow). Tel: 041-643-0037 after 6pm.

Amstrad software: Harrier Attack, Alien Breakin', Codename MAT, Hunter Killer, Flight Path, £4 each. Tel: 01-881-4697, ask for Lam.

Amstrad software for sale, games and utilities or swap. Write: Stephen Turner, 29 Draper Close, Belvedere, Kent DA17 5BY.

Atari

Atari 400-800 1XL cartridges to swap. Star Raiders or Robotron Fer Defender cartridge, or anything else that's good. Tel: Poole 686423.

Atari software for sale. Large range of English software, Thorn EMI, US, Gold etc. All cassettes. Tel: 02556-71986 after 6pm, with your offers.

Atari software disk and cassette, sell or swap. Tel: 0904-791067 after 6pm.

Acorn

BBC Game. Originals, over 14 to be sold. No reasonable offers refused. All under half price. Tel: David 01-722 7885 after 6pm.

BBC Solidisk 128K sideways RAM with manual and utility disks £90. Tel: 0256 472264 after 7pm or weekends.

BBC Hi Micro complete with tape recorder etc. Masses of software. Worth over £750. Will accept £500. No offers. Tel: 01-800 9283 after 6pm.

BBC Games, Manic Miner, Fortress, Cycles, Bucket Raid, £5 each. DD Denis, Gunsmoke, Olympics, Wimpy, £4 each. Chuckie upgrade £2. Tel: Potters Bar 0707 50336.

Acorn Electron and plus 3 disk drive. All new lots of software, cost £350, sell for £275 no fee. Tel: 051-722 5962 6-7pm please.

Original BBC software for sale, Jetpac, Killers, Garuda, Cylon Atari, etc. Bargains £3 to £1. Send for list W K Tam, 127 Brodie Ave, Moseley Hill, Liverpool L18 4RG.

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Sell BBC Overdrive Ghoulia 3D G Prix Aviator, 747, Bandits at 3, Eldorado Logo, Logo II joystick prog. 3D-Deep Space Super Strips, Sphinx arc. Will swap. Also Graphics ROM, Reasonable prices. Tel: 031-449-2277 (Craig).

Swap BBC disk software approx. 200. Send list to: Steven Chan, 16 Lawrence St, Partick, Glasgow G11 5HQ. Tel: 041-334-2168 after 6pm. All letters answered.

Wanted BBC Model B in good condition for around £200 or with disk drives! For silicon £350 no fee. Tel: Coventry 0203-303784.

People's study software for BBC and Electron. Five tapes. Shakespeare including Macbeth, 12th night, Henry IV, 1, Julius Caesar, Merchant Of Venice. Cost £20. All five £5 incl postage. Tel: 0904048-271.

BBC Pascal, view 2.1, for the BBC cost £89. £56, sell for £50, £40 complete with ROMS, manuals etc. Tel: 0698-884499.

BBC B2K 400K disks 9in mono monitor. £700-00. Might split. Tel: 01-482 1699 evr.

BBC Model BSL20 with Acorn joysticks, Stack light pen, manual, leads, tape recorder and games (Frank Dambuster etc). £285. Tel: Bath 21531.

Commodore

CBM64 software, swap or sell. Have access to 700 programs. Many American. Preferably disk. Send list to: Tomas Carlsson, Box 6602, 76900 Hedemora, Sweden.

Commodore 64 version of Activision's Ghostbusters. Unwanted present, sell for £7.80. D Pettigrew, 27 Spier Road, Lachwinock, Strathclyde, Tel: Lochwinock 843313.

CBM 64, CN2, printer, plotter, Simons Basic cartridge, two games. Sell for £300. All brand new, boxed and under guarantee. No offers. Phone Crantock 830789.

CBM 64 software to swap. Cassette only. Practical, £20 each. £50 the lot. Beach garding 10, S-212 22, Malmo, Sweden.

CBM 64 £95 disk, Easyfile, Easyscript, Practical, £20 each. £50 the lot. Beach Head, Slinky, Alice, £5 each. £10 the lot. Phone Knowle 79395.

CBM-64 disk based business software worth over £600, for sale (£150) or swap for equivalent value software. Write Karin Vedvik, Kronstadveien 44, 5000 Bergen, Norway.

Pat 3032, toolkit, plus Microline 90 printer and addressable interface. Some software and CN2 recorder included. £370 net. Tel: 01-653 2648.

CBM 64 games to swap over 300 titles on diskettes. (Send list to: Alan 18 Moseley Rd, Burnley, Lancs BB11 2RF or Tel: 0282-20378).

CBM 64 originals for sale. Flyer-Fox £3, Ghostbusters £2, AsciiPal £5, Slinky £5, Boulder Dash £5, Beasmere £5, Booty £1.50. Tel: 0255-813161 after 5pm.

Commodore 64 + data cassette, joystick, books, over £250 original software including many arcade + adventures all under £290. Tel: Titchfield (Hants) 43986.

Newbrain

Newbrain model AD, transformer, all leads, boxed, never used. Only £135. Tel: Laurence 0480-215488.

Oric

Wanted: Oric wordprocessing software and/or printer lead for 48K Oric 1. Tel: 0200-25315.

48K Oric 1, excellent condition, £80 of software including Trouble In Store, Chess and Ultra. Cost £220, sell for £12. Tel: 0505 843313.

Oric 1 48K £90. Plus £70 software. Includes Hobbit Xenon/Probe 3, Lords Of Time, Hunchback, Tverrga Kingdom Plus others. Tel: John on Kidderminster 0562-74229.

Oric Atmos 48K, compatible recorder, reset switch, joystick port. Software: Basic2ec, Xenon, AsciiPal, Cost £240, sell for £125. Tel: 0596-74803 (Christy-opher).

Swap Atmos software, including MARC, Zorgons, Ultra, Boss, Loki, Chopper Command, Scuba, Harrier, Defence Force etc. £55. Tel: Graeme on Orpington 75008.

Sinclair

Alphacore 32ZX style printer. One year old, perfect condition, with full roll of paper. £45 including P&P. Tel: 0742 361178 (Jae).

ZX Spectrum 48K and software collection including Ghostbusters, Chiller, Blockbusters etc. Sell for £100, no offers.

Sinclair wanted: Spectrum 48K, £90 offered. Tel: Dave 051-424 5553 day-time.

48K Spectrum DK Tronics keyboard, Kempston interface Kempston joystick, Commodore data recorder £50 software worth £275. Sell for £175. Tel: Hornchurch 72626 after 5pm.

48K Spectrum, Fox electronics keyboard, cassette recorder, interface 2 + joystick, original software (£150+) books. Worth £420+. Want £220. Tel: 07073-26308, and leave phone number. May split.

Sinclair flat screen packet T.V. Based with earphone, case, month old battery unused. Quick sale, only £69 (R.H.P. 199) 95. Tel: Glasgow 649-0037 after 5pm.

Spectrum Games Jasper Strangefox, Pajamarama, Kentilla, Factory break out, and many others. Half-price: write Jack Lockerby 44, Hyde Place, Aylesham, Canterbury, Kent. CY3 3AL.

Spectrum software for sale or exchange, including Knight Lore and Zeus assembly. Especially wanted: White Lightning or Machine Lightning. Tel: 0872 78520.

ZX printer for sale. Needs slight attention. Yours for £10 including P&P. Write to: H Shah (sasco), 64 Spring Grove Crescent, Hounslow London TW3 4DB.

ZX interface II, new, still in packing. Unwanted gift. £15. Tel: 051-6520538.

Spectrum 48K, printer, Ghostshot II joystick, programmable interface, and over £600 of software, including KnightLore, Underworld, White Lightning, Exyars, etc. Boxed with full instructions. Bargain £220. Brighton 32505.

Wanted Saga Crusader or Loo+ Profile, including 48K keyboard, good condition. Pay up to £50. Tel: after 7pm 01-806 3523.

Spectrum games for sale. 16K & 48K. Spectrum pensils also wanted to exchange software, etc. Tel: Stafford 47359. Write 14 Greenway, Littleworth, Stafford, Staffs, ST36 3TT.

Spectrum 48K + tape recorder, sw including Dark Star, Amstrad 2 890. Tel: Littlehampton 113763.

48K Spectrum + programmable joystick + Quicksort II = interface I with 1 Microdrive + tape deck + £200 of software and magazines £215 net. Tel: Blackpool 02031 403994.

Spectrum software - 50 originals cost £145. Tel: Laning 764299. Will post on clearance. Tel: 01-533 2529 after 6pm.

16K Spectrum original tapes including Horace and the Spiders and Horace Goes Skiing. Lots of magazines and software £55. Tel: Bedford 0234 59170 after 4pm.

Spectrum DK Tronics keyboard £90, DK Tronics lightpen £15, Microal Eye and Learn £5, Protek Hunter Killer £4, CR1, FIBK £5. Tel: 01-533 2529 after 6pm.

Wanted Spectrum 48K issue 4, joystick and other peripherals considered. Tel: 01-373 635.

48K Spectrum 100 + games, Currah speech, joystick + interface, tape, boxed. Worth £450 sell £300 for CBM64 L2P, £200 for other machines.

Exchange for ZX81 16K if possible 20 approx LPS Electron pin converter exposure meter sunlamp telescope six 3.5mm tape cassettes. Phone 0408-21870 evenings.

48K Spectrum (mint condition) cassette recorder and over 50 programs. Will sell the lot for £120. Tel: 0296 623003.

Spectrum DK Tronics keyboard, Kempston interface, sound box. Over £210 worth of software tape titles. Cassette recorder, mag. Worth £450 sell £250. Tel: 01949 2843.

48K Spectrum interface 2 Microdrives cartridges ZXprinter data cassette recorder 14in Decas colour television, 100 used tapes £400. Tel: 051-678-0435.

Wanted Spectrum pensils over 14 years old. To exchange type, software, etc. Write to: Tony Carick, 236 Central Avenue, London. E8 3SS 4EB.

Spectrum 48K software for sale. All originals, half list price, including Manic Miner, Sabre Wulf, Cygnus, Coeus, etc. Tel: Holywell 0352 712444.

Swap scanner keyboard for Spectrum, unused duplicated gift, £45. Tel: Malvern 06845 88099 after 6pm.

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WD Software, Billtop, St Mary, Jersey
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Microsoft Word is a pretty powerful word processor, but has been dogged by a reputation for intractability. Microsoft has therefore revised it a couple of times, and sets its PR people to phoning up journalists telling them 'the new version's much easier to use, you know.'

The latest (the third, we think) version is called New Word 2, and is currently being advertised with the aid of a young lady in particular disc-slipping posture (see right). If you haven't seen it you can get the flavour of it by hooking your toes over the top of a door-frame and hanging upside down. Now touch your toes.

But there are even more gymnastics in the text. 'The manual has been completely rewritten,' it burbles. 'Word operates even faster now.'

So it looks like, after the odd falsestart, Microsoft could have got it right this time. But the company's got at least one thing wrong. 'New Word 2,' says the ad. 'Right. First Time.'

Meanwhile in Japan Fujitsu is looking a bit more like the Megagalactic Computer Corporation than it used to. The company has just launched the



Microsoft Word — disc-slipping postures with version three.

Facom VP-400, which is the biggest computer in the history of the universe.

It is capable of more than a billion calculations per second, which is the equivalent of 500 million Albert Einsteins, and it runs at more than twice the speed of the previous biggest computer in the history of the universe (this itself had special ultra-fast electrons which moved at speeds equivalent to 3 million Sebastian Coes).

Of course the Fujitsu is pricey, costing £250,000 a month to rent. This in itself is equivalent to rearming Belgium's air force three times a year.

Warning — readers should note that we've made all the above statistics up, but the computer is still incredibly fast and expensive.

Back in the land of lesser quantum leaps, *QLUB News*, the official magazine for lonely

QL users, has just published the winners of its 'What does QL stand for and will you write a limerick about the QL while you're at it' competition. The entries, where they're intelligible, are almost uniformly sycophantic — understandable, considering the fact that Clive-fearing judges chose Quintessentially Lightfingered as the winner.

PCN liked Quarry Lust, but where was Queer Looking and Quiche Lorraine?

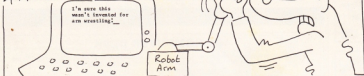
Sinclair itself is currently embattled, with journalists claiming huge share movements are taking place. Sinclair Research says 50 £10 shares isn't that huge compared to the total number.

Watch out Nicaragua. The Grid Compass, already loved by the US military as the sort of micro the best tank squadrons have, has just had a version approved by the US National Security Agency for transmission/classified data. Agencies and military services which send personnel into the field (whose field? — writes our paranoia correspondent) or are involved in something C3I (we think that's tactical to do with confidential communications) applications should welcome the advent of a rugged portable computer with secure communications.

So now when the CIA parachutes someone into the jungle somewhere he can phone home to his family and friends and be confident that his communications are impervious to Soviet satellite snoopers. Phone home? Hey, wait a minute . . .

PAL2000

by Mollusc



PCN DATELINES

Event	Dates	Venue	Organisers
Apple 85	May 9-11	Novotel Complex, Hammersmith, London	Pamela Goodwin, 061-480 7863
Electron and BBC Micro User Show	May 9-12	New Horticultural Hall, London	Database Publications, 061-456 8383
Micro City 85	May 14-16	Bristol Exhibition Complex	Argus Specialist Exhibns 04427-73291
Hong Kong Comp Conf & Exhbn	May 21-24	Hong Kong	Trend Exhbn, 1203 Wah Kwong Building, 60 Hennessy Road, Hong Kong
DEXPO South	May 26-29	New Orleans, USA	Reed Exhibns 01-643 8040
Compec Europe	May 7-9	Brussels	CGP 01-528 9256
Nat Software & Comp Exhbn	May 29-31	Brisbane, Australia	Riddell Exhbn Promotions, Riddell House, 137/141 Burnley Street, Richmond, Victoria 3121, Australia
Business Computer Show	June 4-6	Earls Court, London	Reed Exhibns 01-643 8040
Computer Peripherals & Equipment Trade Exhbn (COMPETA)	June 4-6	Kensington Exhbn Centre, London	Network Events 0280-815226
Software Show	June 4-6	Earls Court, London	Reed Exhibns 01-643 8040
Commodore Computer Show	June 7-9	Novotel, London	D&S Marketing 01-630 6071
European Unix User Show	June 12-14	Olympia, London	EMAP Exhibns 01-837 3699
National Computer Conf and Exhbn	July 15-18	Chicago	American Federation of Information Processing Societies, 1815 N Lynn Street, Arlington VA 22209

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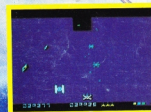
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