THE Z88 FILES

NOT THE MAGAZINE FOR Z88 OWNERS

It's

Groovy
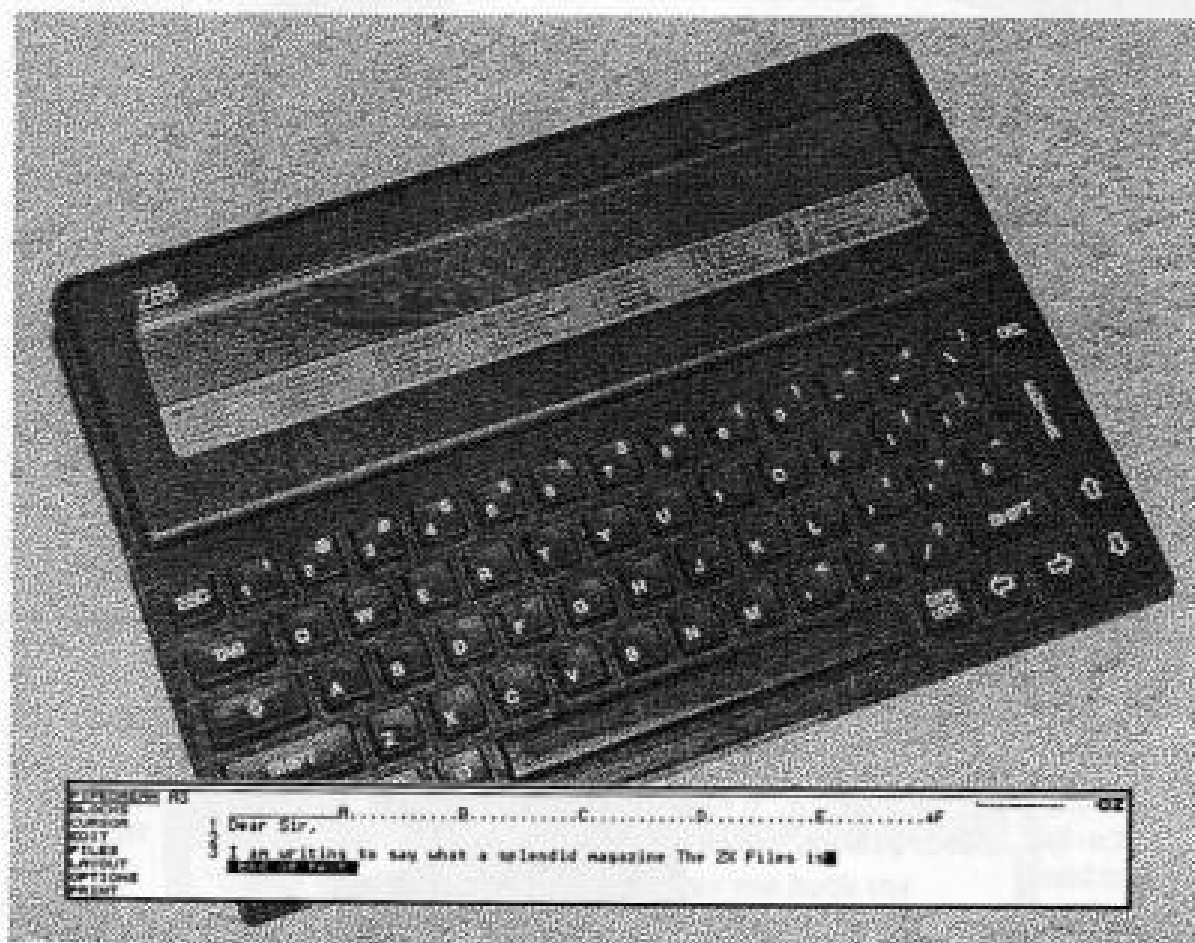
Baby

Introducing The Z88

The Z88 is a portable laptop computer, sleek in design and it has a rather sexy black look to it. Among the things it is capable of are word processing, databases, spreadsheets - and it will even run the odd game. But before you read on I must point out that this little

inexpensive and will allow you to type on the go then this could be the choice for you.

I have a Z88 and am pleased as punch with it. The reason as to why I bought it was so I could do most of my word processing for The ZX Files and other

A Z88 in all its glory and (inset) Pipedream in action.

black box of tricks is not powered by a PII processor, will not run Microsoft Office or games like Quake 2 and is over 10 years old. If this is not what you want to hear then you are better off venturing to PC World to buy one of the many luxurious and expensive laptops available there. If however you seek something that is

things without been shackled to my PC all the time. It serves that function and it serves it very well. In the year I have had my Z88 I have come to appreciate it for all its good points and begun to use it for a far wider range of functions, including playing games – something that I'm sure Sir Clive would laugh at. Don't get me

wrong, the Z88 does have it's niggles, but as they say round here "nowt's perfect".

What is instantly noticeable when you first pick up a Z88 is the weight; or rather the lack of, as the machine weighs in at a respectable 900 grams, so it will slip virtually unnoticed into any briefcase or bag. Although released over 10 years ago it still looks as sexy as it did back then with its cool black appearance. It is also very compact in size as well; just barely managing to cover an A4 sheet of paper, and as the Z88 does not have any built in disk drives it is a slender 23mm in depth. Economy wise the Z88 cannot be faulted as four standard AA alkaline batteries will keep you keyboard bashing for around 20 hours, whilst a nearby plug socket can be utilised with a 6.5v mains adapter. The rubber keyboard it possesses may bring with it derogatory remarks but is very responsive and almost silent in use, ideal for when you need to take notes without disturbing anyone. The keyboard itself has a standard QWERTY layout, with CTRL and ALT keys been replaced by square and diamond symbols. Applications built-in includes a combined spreadsheet and word processor and a diary.

As before I mentioned that this laptop does not use a Pentium processor but infact utilises a CMOS Z80A running at 3.2876MHz. Although significantly less powerful than todays whizzy processors the Z80A still manages to be very nippy at any task you should throw at the Z88. Underneath that black exterior of a standard Z88 comes 128K of rom and 32K of ram. The three card slots at the front of the machine each allow up to 1Mb of ROM or RAM in the form of cards (similar to a Playstation memory card) to be added, thus expanding the machine's capabilities with additional memory, software and data back-up. Internally the Z88 can be upgraded from 128K to 512K. Looking at the screen may put PC snobs

into a state of shock as it is only a 640x64 pixel LCD display, a feature which helped the Z88 be made so small. After using a moniter screen for so long this new screen seemed at first very restrictive to me but after a short while it was hardly noticeable as moving through documents is a breeze. The screen does have adjustable contrast but alas no back light. This has not been a problem for me but there are clip-on laptop lights available that will do the trick should you need one. Sound comes from a miniature loudspeaker, used mainly for alarms or warnings and although quite basic it has been put to good use in a few games.

OZ, the name given to the Z88 operating system, helps provide task-switching between applications so an application can be suspended at any time and re-entered again when required. The machine may also be switched off at any time without loss of data.

The applications available to the Z88 from it's 128K Rom are Diary, Pipedream, Basic, Calculator, Calender, Clock, Alarm, Filer, PrinterEd, Panel, Terminal and Imp-Export. You can, memory permitting, have many applications running at once and switch between them using the □ key. So for example to switch to the Diary you would press □D, or you can press the INDEX key and select the chosen program from the applications menu. PipeDream (pictured opposite) is for me the main application on the Z88 and the reasoning for my purchasing it. It is a combined word processor and spread sheet and is also capable of creating simple list databases. The functions given to Pipedream are quite comprehensive, even for an application that is over a decade old, and a vast array of formatting and editing functions are included. One area that Pipedream is lacking is that it doesn't have a built in spellchecker. This though is not a problem for me as any text I write is

transferred over to Microsoft Word and checked there. There is however another word processor available for the Z88 which does include a spellchecker called SpellMaster that is available as a separate Rom card.

You may be wondering how to get that large essay you have just sweated over on to your PC so you can print it out – especially as the Z88 doesn't possess a disk drive. Well help is at hand with it's built in 9-pin RS232 port. By connecting to your PC (or Mac, Amiga, ST, BBC, Spectrum) with a suitable cable and with the correct software on your computer you can transfer data with the press of a key. Believe me it is dead simple to use, even for me – and before long you will transferring all manner of data to and from your Z88.

So there you have it, a small and brief description of the Z88, and why for me it is the ideal companion for typing when away from your PC. I just don't have the time or the space to really go into great detail about each application, the technical specifications of the machine or how to best get the most from your Z88. But what it basically boils down to is that the Z88 is capable of many tasks at the fraction of the price of a machine much more expensive. My Z88 can write documents just as well as any laptop - just don't expect it to be as good as that £1000+ laptop running hundreds of pounds worth of the latest software. I doubt any Z88 owner will try to convince you that they own some all singing and all dancing wonder machine. They will however tell you that it remains simple to use, uncluttered by expensive features they don't need and it does what it does very well.

If you want more information then I would heartily recommend you speaking to any of the Z88 suppliers listed in the back who I'm sure will be more than happy to assist you in any queries you have. Don't

BEZ'S HaNDY Z88 TiPS

"So you've just bought a Z88 and want to know a few handy hints. Well below are some brill tips that will keep you and your Z88 out of trouble in the future. Jobs a good un.

It's always worth investing in protection for your Z88 so it doesn't come to a nasty end. Rakewell sell heavy duty toppers that will stop the screen from been broken.

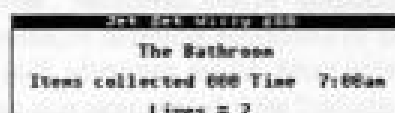Always take a spare set of batteries with you and your Z88 on those long journeys.

The Z88 can act like a dust magnet so you will want to keep it clean. People use wet cotton buds, compressed air or just a damp cloth – there is no hard and fast rule. I prefer to use those keyboard wipes that come in those handy little packets which are available from most computer stores. These do the job really well and I always carry some spares in my Z88 case – you just never know when you'll need one.

Careful when using the Z88 on a hot day as direct sunlight will make the screen go funny.

Treat your Z88 with care and it should last you a lifetime. You know it makes sense".
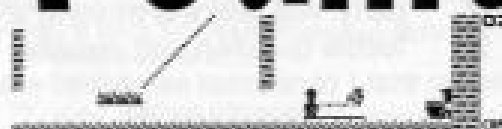
It's only A game

One area of use I imagine Clive Sinclair never envisaged the Z88 been used for is in the area of games. And though it will never match the GameBoy in this department, with the help of some talented and dedicated individuals you can now take a break from the chores of typing.

Recently the Z88 has had a whole batch of platform games released by enthusiastic coders. Games like Jet Set Willy, Manic Miner and Sir Lancelot have made the transition from Spectrum to Z88, losing nothing in the process either. Graphically and sonically the games are identical to their Spectrum counterparts, even down to accepting the same pokes that the originals used. Where the Z88 versions differ is the way the screen is set out, due to the size of the Z88 screen. The games can be played "squashed" so you can see the whole playing area or you can play it so you only see half of the screen at a time. You can toggle between the two screen modes at the press of the button at any time during play, so game play remains virtually the same as playing on a normal screen.

No computer or console would be complete without a version of Tetris, that infuriatingly addictive game that sold a Zillion GameBoys, and the Z88 is no exception with a game called Zetriz. It has to be said that the Z88 screen is perfect for such a game because by turning the machine 90° you have an ideal playing area for the falling blocks.

Any budding Tiger Woods can if they want take a stroll on the fairways with the aptly named Golf. All the usual options are included and the graphics are clean and crisp, and with a choice of 5 courses this game has plenty on offer.

If you require something mentally stimulating then there are plenty of puzzlers to choose from including Sokoban, 3 Card Monte, Solitaire, Yahtzee and Kingdom. Kingdom is a version of that classic text game where you need to juggle crops and taxes so you don't end up killing everyone.

One of the first games I ever played was City Bomber, a simple game which has a plane flying over a landscape of buildings made from blocks. Each time the plane fly's over the screen it gets a little bit lower. Just so you don't fly into the side of a building you are given an infinite supply of bombs so you can try and destroy them. It may sound deceptively easy but the Z88 version is just as addictive as ever and you'll be dropping bombs till the early hours.

There is a utility in development titled WhatNow? by Garry Lancaster which will enable snapshot versions of Spectrum adventure games created with GAC to be played on your Z88. It is still in development but when it is released it will revolutionise my Z88, and I'm sure many other peoples as well. There's an abundance of true classic adventure games waiting to be plundered for use with the Z88 and I'm sure there will be a few more written as well. The opportunities are endless.

My ideal game for conversion would be Elite, but I'm not sure if that would be possible. Still, it would be a mouth watering prospect that if ever converted would be worth buying a Z88 just to play it. A defender clone wouldn't go amiss either.

As far as I know all the above games are in the public domain except for Z88 Golf which is available from Rakewell Limited. There are plenty more games available but I have yet to try them. This however will soon be put right as my next magazine will attempt to cover everything in the Z88 gaming scene, from reviews, previews, cheats and tips, and the occasional interview as well. And it's free too!!!

KOOl And The Gang

There now follows a party political broadcast on behalf of the Z88 party. Actually it is more of a feeble question and answer session that I conducted via e-mail with some people involved with the Z88 scene. Hopefully the questions I have asked will help shed some light on the Z88 and the people involved – if not at least I get to fill a few pages quite easily.

Now here are the Usual Suspects rounded up from the world of the Z88.

Garry Lancaster (GL)
Andy Davis (AD)
John Allen (JA)
Dennis Groning (DG)
Vic Gerhardi (VG)
Dominic Morris (DM)

1) Can you tell us what you have provided for the Z88 community and perhaps what you have planned for the future?

GL: Well, probably the main thing has been the "Z88 Forever!" website, which has been up now for just over 3 years, and I know has helped encourage many owners to dust off their Z88s and start using them again, as well as getting new users interested in the beast.

On the software side, I've written several applications and popdowns (all free), the most useful being the Unzip and ZipUp utilities. Others include AlarmSafe, Bootstrap and Lockup, as well as a conversion of Matthew Smith's classic Speccy game "Manic Miner" (thanks must go to Dominic Morris here for some much-needed motivation!)

Bearing in mind most people's limited EPROM space, I've also squeezed 13 of the best free applications into a single 32K EPROM compilation, and have produced "RomCombiner", which allows you to combine several ROMs into a single card. More recently, I've written "Installer" which lets you run applications in RAM, and is especially useful for software developers.

For the future, I'll be producing a system to allow GACed adventures to be played on the Z88 (eventually expanding this to include Quilled and PAWed ones as well). Mind you, I have been saying this for a couple of years now!

AD: Erm. I suppose my role is to keep Spectrum users of the Z88 connected with what's happening. I try to get as much material from the internet, where most of the Z88 scene is, to non-net connected users and relay the information via AlchNews and on paper newsletters. We were considering a paper Z88 magazine because we felt that the latest paper Z88 magazine to be launched is run by someone who knows very little of the scene and is not as well connected as us.

JA: I wrote the book "Z88 PipeDream: A Dabhand Guide" (Dabs Press £14.95 - I think it may be out of print now), a lot of free software to link the Z88 to the BBC micro and, more recently, to Acorn RiscOS based computers. I have also written about the Z88 in a number of computer magazines, principally Acorn User and The Micro User. My articles and software from Micro User days are now available on the Internet at: http://www.bramber.demon.co.uk/john/z88/

DG: Contributions to the Z88 Users' Club and Software Library:
Jul-89 Announcement of ZX Spectrum-

Z88 IMP/EXP file transfer program.
Nov-89 Discovery of a PrinterEd Bug and Fix.
Dec-89 ZX Spectrum-Z88 ImpExp listing of updated version.
Feb-90 X010 BOOT.CLI, X011 Delete : RAM.- cli.
May-90 Z110 Z88/Spectrum ImpExp, Z111 Copyfile, Z112 Label Printer, Z113 Xerox 4045 Prnt Driver.
Apr-91 Z133 Spectrum-Link v2.00, ZD01 Manual.Z88, Corrections/additions to Z88 User Manual.
Sep-91 Serial Communication With The Z88, :RAM.- problems, Non UK cli esc symbols, Nicad use, Z88 A Dabhand Guide errata, PrinterEd tips for Canon BJ10e, Printer Editer bug fix clarification.
Oct 91 Z157 FileCompare.Bas, Z158 EpromCat.Bas, Z159 ROMDMP6.BAS, Z160 Print.Bat to use a PC as a parallel printer interface.

My Z88 web site http://www.algonet.se/~dennisgr/z88.htm:
Sep-96 PipeView, a Windows PipeDream file viewer.
Jan-97 Z88-Xport, a Windows Import-Export filetransfer program.
Aug-97 Z88 BBC BASIC (Z80) Viewer for Windows
Sep-97 Eprom-Xport, Z88 BASIC program sending files from EPROMs using the Imp-Export protocol.
Jan-98 Converting Z88 files to HTML format using a printer driver.
Feb-98 Connecting a Z88 to a Modem.
Feb-98 More Z88 Links.
May-98 Z88 Now and Then, Z88 information sources in the past and now.
Aug-98 XY-Modem, a Z88 popdown application providing Xmodem filetransfers. Ymodem coming.

There is much to improve on PipeView. When XY-Modem supports Ymodem fully, Z88-Xport should have Ymodem support added. File transfers to and from EPROM could be useful.

VG: Z88 Magic, SqueeZ~88, Training

Days, Over 10 years of supporting the beast.

DM: My output for the Z88 has actually been quite small, I think I might be up to the seventh program now, I'll list them for you:

enigma.bas - BBC Basic Enigma Machine Simulator
sound.bas - The first Z88 sound demonstration!
screen.bas - A little shorty to display Spectrum screen$
Sokoban - Conversion of my Speccy game with all the bugs fixed
JSW - Well, I didn't write it but...
Sir Lancelot - Same again really

The last three were quite good fun to convert, well, at least at the start! I got seriously sick of JSW towards the end - so much so I went on holiday half way through it! (Actually this was pre-planned, but rather fortuitously timed!) - If I ever have to see another byte of Matt Smiths code again I'm sure I'll scream, the only word to describe it is horrendous.

I've got a couple of very exciting projects on the boil at the moment, which I can't really say too much about but I'll be woofly instead: The first one I'm working on with Garry Lancaster, and though it is working it needs a thorough re-write before we can release it, hopefully at the NSSS in November, but I think we'll have to pull our thumbs out to do it by then! The second one is now entering beta test phase and has been sent out to a bunch of testers who are trying their hardest to break my code, it's already in a good enough state for general release but I'd like to add a few more features before I do.

One project I can tell you something about is something that I've been playing around with for a couple of weeks, and it's a Chip 8 emulator for the Z88 and for the Spectrum as well (if I can be

bothered to release it) - it's in quite a good state at the moment, and you can play most of the Chip but not SChip games, I'm fitting work for that in around everything else I've got to do as well, which means that I may only touch it once a week or so.

2) Can you remember how and why you came to own your first Z88?

GL: Early in 1995, I was flicking idly through a PC magazine and came across an advert from a firm who'd bought up the remaining stocks and were selling them off cheap. I knew how good they were from someone I knew at university, so I sent off for one there and then! I still regret not buying a 1Mb RAM card when I had the chance, though...

AD: I came across it at the second NSS show. I wasn't really looking for a machine at the time but there were loads of people prodding and pressing it and giving it some real abuse and felt that it needed to be rescued. It was actually owned by Colin MacDonald. (Hi Colin if you're reading - thanks for the sale, it really changed my life).

JA: I was lent an early machine to review for BBC Radio London (where I did a regular computer feature) and immediately recognised its potential as the mid ground between my office PC and home BBC micro - they all had the same software - PipeDream on the PC and Z88 and View Professional on the BBC. So I bought one.

DG: I had used a Sinclair Spectrum 48 with two microdrives, Omnicalc2, MasterFile and Tasword a year or two for members lists, book keeping, letter writing and technical calculations and I wanted something better. A PC AT compatible was still too expensive (4 times the Z88 price I think) and the portability of the Z88 was appealing. After I bought my Z88 in the June 1988 I was

very satisfied. It was truly portable and useful. Soon I carried it in a small backsack to work every day for technical calculations in my work as a techanical engineer and on weekend evenings to the motorcycle club for administration.

VG: Always wanted a portable computer. Saw it at Birmingham NEC and got one soon after that.

DM: I'm actually a very latecomer to the Z88, I got hold of one back in April 1998 when Andy Davis asked me to write an Alchnews shell for the Z88, which sadly hasn't seen the light of day yet (now released —ED), so a long convoluted history you shall not have! Actually I remember seeing a Z88 at school when they first came out, I think my computer science teacher had one and it looked so nice though I only got as far as turning it on and then back off again before it was whisked away from me, and I was told to get back to work moving a couple of objects round the screen from BASIC (dog and man. Those were the days when beebs were high-tech networking, hacking consisted of *remote-ing, and you could take a computer apart and know what all the chips were for). When I first started to write programs for the Z88 what struck me most of all was the way my programming style would have to change, OZ is undoubtedly one of the most beautiful operating systems ever written, though it does occasionally verge on the over-protective at times, and I had to use it to get things done, I can tell you that it did take me quite a while to get my head around it!

3) What is it about the Z88 that keeps you using it when there are far more powerful laptop computers available?

GL: I think today's laptops are a bit of a joke, to be honest. They may be powerful in theory, but as it takes you over a minute to boot up the thing, load your word-processor and re-open your last

document, they're actually much less productive than the Z88, which can be switched on instantly. They last a pathetically short time on batteries (2-3 hours, typically) whereas I get around 20-30 hours from a fresh set of AA batteries. I also prefer the keyboard, which is much easier on the fingers over a long period of time. I could go on, but you get the picture!

AD: The main reasons are that it's small, light and runs from standard AA batteries. It's got loads of built in functions and, thanks to the work of Dominic Morris and Garry Lancaster, now has some Spectrum games! I also like the fact it has an on board EPROM programmer. It's truly a portable Spectrum and ever 'meddlers' dream!

JA: I used it for some time, mostly because PipeDream is really well suited for scripting with its column structure (I was then a BBC radio education producer) and that it easily popped in the briefcase. In more recent years my job has changed and the Z88 makes few appearances these days.

DG: The portability is number one. I can sit anywhere or even lie in bed using it. Naturally then I hate using it on the mains power adapter. Instead I like having two or three sets of ordinary nicad rechargeables to change with. A set lasts two to three hours of effective work before recharging. I have never considered using an external five cell rechargeable battery pack to regain the 20 hour run time of alcalines. It would be too awkward. If however more then a week passes without use, the risk is very high that nicads lose their charge and all RAM files are lost. The power of PipeDream is number two. If only I could touch type it would be perfect for note taking at meetings.

VG: It is simple to use, fast and you don't have to wait for the operating system to come on-line.

DM: I have to admit I don't use the Z88 that much at the moment, it just sits on my desk and gets in the way of my Amigas keyboard! - I've used it in the past to write up reports whilst sitting on trains/outside in the sun and do hope to write my thesis up on it (again whilst sitting on trains/out in the sun!) - the Z88 is great for this, it's small, light, easy on batteries. My girlfriend has a P133 laptop that weighs several pounds, is very prominent and eats batteries like they're chocolate, it's a nice machine (though I wouldn't touch PCs with a bargepole), but give me the Z88 any day!

4) What are your favourite applications you use for the Z88 and why?

GL: PipeDream is the one I use all the time; it's just very well designed, like the Z88 operating system itself. Of the commercial offerings, I find the Assembler Workbench incredibly useful.

AD: Mostly the new applications on Garry Lancaster's Z88 FOREVER ROM. Plus Pipedream, of course.

JA: PipeDream. It was ground breaking, even if eccentric. The late Mark Colton (its author) realised that all these productivity tools could be put together. It is a shame that Mark's death has stopped development on PipeDream and its PC and RiscOS successor, Fireworkz, which I still use on a daily basis.

DG: PipeDream unchallenged, for calculations, word-processing and simple database use. It's so useful to have all those functions in one program.

VG: PipeDream - because you do not have to 'plan' the layout of the spreadsheet.

5) Have you taken time out to play any of the games that are available and if

so which one(s)?

GL: Yes, I've played all the recent crop of games (Zetriz, Sokoban, Jet Set Willy, Sir Lancelot, and of course Manic Miner!) They're great if you're stuck at a desk over lunch with nothing to do. I do tend to spend more time writing software than actually using it, though!

AD: I've played Jet Set Willy a great deal, and Sokoban.

JA: I never really saw the Z88 as a games machine, so have never really explored its games.

DG: Yes, Zetris and Sokoban. I started using computers when I was over thirty. Perhaps because of this, game playing doesn't come so high in my priorities.

VG: Not yet, but I like the sounds that come out of the latest ones!

6) What would you like to see been developed for the Z88, be it an application, game or hardware?

GL: I'd love to see more Speccy games converted across, although the choice is quite limited by what could reasonably fit into the Z88's screen. On the hardware side, it would be nice if somebody could produce a reasonably-priced 1Mb RAM pack, as these are impossible to get hold of now...

AD: A compiler of some sort, be it BASIC or PASCAL. We've got FORTH, which is really good.

DG: Bug free operating system OZ. Infrared serial communication. TCP/IP and SLIP for simple Internet use as email, telnet and ftp.

VG: An Internet browser and mail server - but there's dreaming for you.

DM: The one thing that would make the

Z88 nicer would have to be a larger screen, if it was three times the vertical size it is it would be absolutely brilliant - and you'd be able to have games that don't have to scroll! All points addressable graphics would be nice as well - so basically I'd like a resolution of 640x192 hardware driven playing area - would make for some really nice looking applications - have a look at the Psions to see what I mean. Of course, that's all a bit of dream, it will never happen, but being realistic, what would be nice would be, actually I don't know, the Z88 has all the basic applications built in that you could ever realistically need, a built in address book would be handy though.

7) Finally, have you anything else you would like to talk about relating to the Z88?

GL: The Z88 is a great computer, but really it would be nice to see a new portable along similar lines using some of the technology available now, ten years on. Unfortunately the major manufacturers today seem intent on providing "cut-down" PC's which aren't at all satisfactory. I think it would take someone like Clive Sinclair to produce a worthy successor...

AD: I think it's an ideal progression or companion to the Spectrum. Every person I know who has been vaguely interested in one has instantly purchased one. I just wish that the prices would drop a little to allow more people to enter the scene. I also hope that more people than just myself would get involved in transferring 'net stuff to paper, I'm still very busy with AlchNews.

JA: In its day it was a revolutionary machine for the price, I think it must have suffered from the public perception of Sir Clive Sinclair after the launch of the C5 which was a great pity.

DG: *When is an EPROM fully erased?*

An EPROM stores bits of data in very small capacitors a little like small batteries. A 32K having 262144 of them. A cell is programmed by loading it with an electrical charge and erased by ultraviolet light releasing the charge. The charge (or voltage) is interpreted as a logical 0 when above a certain threshold level or a logical 1 if below the threshold level. Now the problem is that if the charge is very close to the threshold value, a change in temperature could cause the cell to change value. The moral of the story is that an EPROM should be erased two or three times longer than it took to read empty, to be reliably erased. Actually the same goes for programming. A byte is overprogrammed twice as many times it took to read the correct value the first time. Credits for this information goes to Richard Russel, who implemented the Z88 BBC BASIC.

Accidental corruption of EPROMs.
EPROMs, regardless of if they are used for storing files (EPROM) or have applications programmed on them (ROM), can be damaged if they are located in slot 3 when the Z88 is first powered up after the Z88 has been unpowered by batteries going low or batteries removed for too long. They can of course be erased and reprogrammed but the files or applications are lost. I.e. never put application ROMs in slot 3 and be careful with EPROMS.

DM: Finally, I have to say a big thank you to everyone who helped me when I first started writing programs for the Z88 - it's truly amazing how friendly everyone is - it's such a complete contrast to the Spectrum arena where everyone is too busy stabbing each other in the back to get anything done. It's a long time since I wrote something for the Spectrum, and these days there's very little incentive to do it, the Z88 scene is far friendlier, vibrant, enthusiastic, ego-free and to be completely blunt an awful lot more

interesting.

Additional information
Garry Lancaster's web site, the Z88 Forever! Page can be tracked down at: http://www.menaxus.demon.co.uk/ Here you can find most of the utilities and games mentioned here as well as lots of useful and interesting information. It is probably the best Z88 site available and the one I visit most often.

Alchemist Research have a site at http://www.alchemist.clara.net where there is information and downloads not just for the Z88 but also the Sinclair Spectrum, including the wonderful AlchNews magazine (which just so happens has been released for the Z88). You can also write to this address requesting information about the company and what they offer. Alchemist Research, 62 Tithe Barn Lane, Woodhouse, Sheffield, South Yorkshire, S13 7LN. Don't forget to include a SAE.

Rakewell have a web site at http://homepages.nildram.co.uk/~rakewell Here you can find information and prices of all the Z88 products they have on offer. Alternatively you could use snail mail and write to Rakewell Limited, 24 Putnams Dr, Aston Clinton, Aylesbury, Bucks, HP22 5HH asking for a price list. Don't forget to include a SAE.

Bill Richardson and Co. also supply Z88s and accessories as well as supporting the QL. Write to Bill Richardson and Co. (EEC), 6 Ravensmead, Chalfont St. Peter, SL9 0NB and request a price list. Don't forget you know what.

I must thank all the above people for helping me create this ikkle magazine. All have been extremely helpful in all matters concerning the Z88 from the day I bought mine. I have also purchased items from both Rakewell and Bill Richardson and they were both quick and prompt in their service. Thank you.

Z88 GAMER

If you own a Z88 and want the best in gaming information then drop me a line at my home address giving me your own address. Then you will receive on an irregular basis a free gaming magazine with all the reviews, previews, gossip, hints, cheats, solutions, maps and interviews I can squeeze in. So go ahead, it won't cost you a penny and it will be delivered free to your door.

YOU'D BE MAD NOT TO.