PRIVATE
# ENIGMA
magazine.

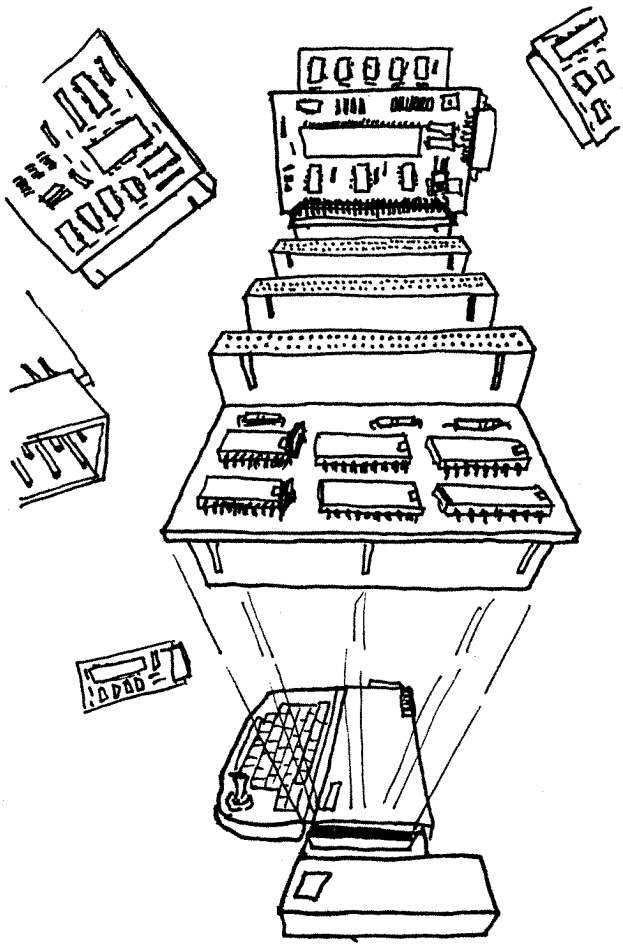
NOVEMBER/DECEMBER 1986

ISSUE 7
An I.E.U.G publication

NEW CP/M PAGE
IS-DOS review
Readers views.
THE SAGA
KEY CODES, Disassembler PROGRAM and more...

# Announcing a major new step in Enterprise Expansion

Rememember the original Enterprise specification - "Expandable up to 4 Megabytes", and the superb original plans for it's hardware.



Soon you will be able to free your Enterprise from the limitations of it's memory and from the poor quality built-in ports, with a totally new expansion system, designed to grow with your computing needs.

A motherboard system is the backbone of a professional computer, and ours will take the Enterprise firmly into the realms of buisiness computers, and hardware and software development systems costing many times more.

A new range of plug-in cards is being developed, including memory cards; professional serial and parallel interfaces; relay control cards etc.; and exciting new developments like an EPROM programmer, sound sampler, video digitiser, second processor, and sprite board are in the pipeline for next year.

The basis of the system will be the "mini motherboard", very similar to the Enterprise - EXDOS connecting box, and sitting where the fabled "base unit" would have sat.

One card can plug into this mini motherboard, and will provide a low-cost introduction to the system. Larger motherboards will also plug into this mini motherboard, and will allow the connection of 4, 8 or more cards.

The system is compatible with all hardware expansions including EXDOS.

JOIN US!
We are a couple of electronic engineering students who are keen to see the Enterprise flourish as a top quality machine in the home and in business.

If you have experience in amateur or professional electronics design and construction, then we need YOUR help to get this system going.

Contact us if you have ideas for cards to fit on the system, or if you have designed and built similar circuits. We will pay generous royalties.

The motherboards should be in small-scale production by the end of the year, with lots of cards following on shortly.

Send an SAE for technical details to:


Andy Burnham,
Elvyn Richards Hall, 213903
Ashby Road,
Loughborough, 216050
LEICS.
LE11 3UQ
(0509) Warden 232342


# Dataquip Electronics

Expanding the Enterprise

Some estimated prices:

Mini Motherboard.....£15
4 slot motherboard.....£20
2 port parallel card...£20
256K Memory Expansion..£40

PRIVATE ENTERPRISE magazine. Nov/Dec 1986

# Editorial

Christmas once again and to mark the occasion this is the biggest 'Private Enterprise' mag yet produced, hopefully containing something for everyone (unlike the rather technicalissue 6). However,in most of your minds this is not going to suffice for the 'mayhem of 1986". Our initial plan was to produce a mega issue of some 68-odd pages, but after studying the feasibility of producing a magazine of this size quickly (in like of our previous track record), we ditched the idea. Therefore as an alternative, we shall be extending the period of membership until after the publication of issue9.

Since my editorial in issue 6 there have been some upheavals here at IEUG HQ. The first of these is the relocation of IEUG HQ from London to Crowborough in East Sussex. I have taken over the mantel of secretary from Tim, leaving him free to pursue more technical projects with BoxSoft. This of course means ANOTHER change of address, see the news page for full details. Another uphaval saw the arrival of Eamonn O'Leary, who has taken on the artwork and layout for this issue as Mark was unable to spare time due to art collage committments.

"This is all very well" I hear some of you saying "but I've not seen any new software for months!". All I can say to this is please bare with us. In my letter which proceded issue 6, I said that all software copy-rights reverted to the original authors, In fact I was mistaken, and all copy-rights were suspended with the assets of Enterprise until recently they were bought by Broadlight LTD. We have now to negtiate with Broadlight for the right to re-release these titles, so hopefully something will be appearing very soon.

Finally, a plea to everyone who doubts our sincerity and doubts our ability to carry out our promises, turn up at the A.G.M and then make your complaint. we need as much feed-back back as possible, so if you're dissatified with us, come along and say so.

Neil Blaber

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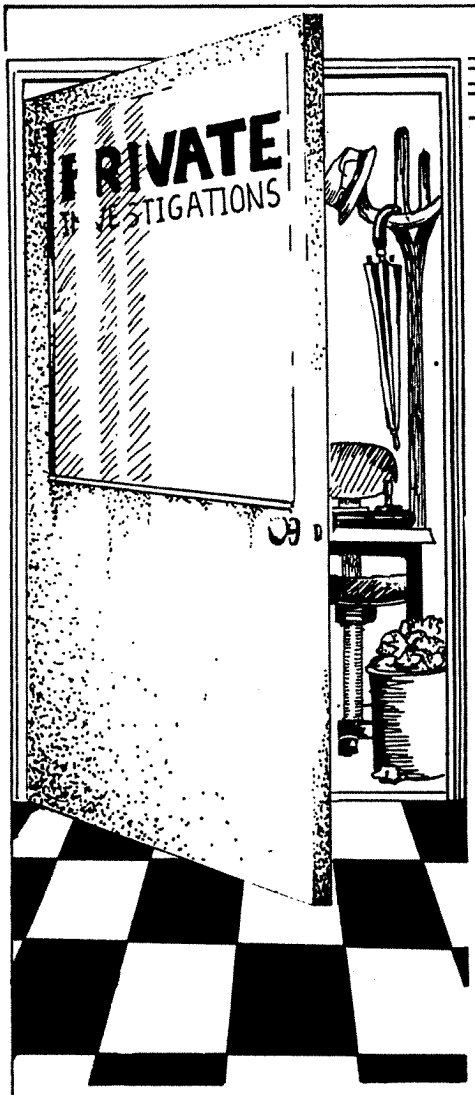
# News Desk




## Make Contact

One of the main reasons people join a user group is because they want to meet other users. This in IEUG members case has not always been possible because members are spread so far around the country and because we only officialy organise members in London. We have therefore decided to try and remady the situation by offering a new service. THE ENTERPRISE CONTACT.

If you are into M/C programing, Electronics, Amator radio or any other hobby or just want to contact other members, the task is simple, just write to us here at the IEUG staiting your name, address and hobby (if applicable) we then will in the following issues of PE print all this information. This will we hope aid comunication between members.

### ENTERPRISE SOLD

The assets of Enterprise have been bought by Broadlight Ltd. of London W1. Their intentions at present are vague but it is known that they will not be relaunching the Enterprise in this country, or reissuing any of the previously available software themselves.

## Dot Matrix Discount

A limited number of Enterprise dot matrix printers as reviewed in P.E. No.1 are available at £159 brand new and fully guaranteed, £80 below original list prise. This however does not include the cost of printer cable (which can be purchased seperatly from BOXSOFT at £12.80). The place to go is the Sonic Foto Centre 245-256 Tottenham Court Road London W1 Telephone 01-580 5826.

### CP/M PUBLIC DOMAIN SOFTWARE NOW AVAILABLE

IEUG members who own disk drives can now take advantage of the Public Domain CP/M Libraries, which comprise about 650 disks (not all programs will run on the Enterprise though). More details on this on the CP/M Page later in this issue.

### THE IEUG CURSE CLAIMS ANOTHER VICTIM

After running items on the IEUG in its pages in Issues 2 and 4, the weekly computer paper "Bang !", launched at this years PCW Show, has collapsed after only nine issues. It follows in the footsteps of Home Computing Weekly, which expired after it ran a feature on the IEUG and placed an advertisement in Issue 2 of Private Enterprise. We only hope the same fate does not befall Personal Computer World, which will be running a feature in the New Year.

### CHANGE OF IEUG ADDRESS

Just when you thought it was safe to send all your letters to New Barnet, the IEUG central contact address has changed again - hopefully for the last time. From now onwards, please send all correspondence to :-

IEUG,
P.O. BOX 13,
Crowborough,
EAST SUSSEX. TN6 1QX.

The new IEUG Hotline is in operation between 7.00pm - 10.00pm Mondays to Saturdays and from 2.00pm - 10.00pm Sundays. There will be an answering machine service available at all other times if you need to leave messages or have important enquiries. The number is 08926-3898.
But if you would like to speak with Tim, his number is still (01-449-4119).

### THE IEUG ANNUAL GENERAL MEETING 1986

The IEUG Annual General Meeting referred to in Issue 6 will take place at St. Mary's Hall, Hendon Lane, Finchley Central on Saturday the 13th December from 1.00 - 5.00. Bus routes are 143, 13, 260 and 26; Tube Northern Line to Finchley Central. An agenda containing motions for discussion and a map should accompany this copy of Private Enterprise.

## Errata

A few erorrs slipped into the last mag, firstly the price of ZZZip was printed as £17.95 when it should have been £ 12.95 and the missing line from the same article read '...and there won't be many programs around that can't be speeded up by it.'

We also failed to print the author of that brilliant article BASIC EXTENTIONS (the source of the new BOXSOFT program IS BASIC EXTENTIONS by the same author) who is Andrew Richards.

# THE CASE OF MR INGHAM V VERRAN (micro maintenance) LTD.

In our previous issue, we mentioned Verran (Micro Maintenance) Ltd. (ex-Enterprise Service Centre) as a source of repair facilities for Enterprise machines. Since then, it has come to light that the service they provide is nothing short of abominable, as the following diary of disaster illustrates.

9 August

Faulty 128 dispatched together with cheque for £39.95 (this amount requested prior to any investigation).

26 August

Wrote to Verran, enquiring after delay.

27 August

Cheque cashed by Verran

28 August

Reply from Verran "Did not receive machine until 19th August" Machine due for dispatch 5 - 7 days"

9 Sept

Telephoned Verran, who "did not receive machine until 29th August", even though reply to letter stated 19th August.

10 Sept

Wrote to Verran - no reply whatsoever

17 Sept

Wrote to Verran again - no reply to this or previous letter.

Wrote to IEUG for help:

"...there must be some funny dealings going on... I am utterly disgusted with the treatment I am receiving... If there is anything you can do at your end, I would be grateful."

18 Sept

IEUG phoned Verran. "Our admin computer went down, hence the mix-up with dates. Machine is under repair"

28 Sept

Wrote to IEUG again to inform of situation. "I think one's instinct tells one when an excuse is genuine or not and the one Verran gave to you does them more discredit - better they had just said sorry for the delay...They deserve to end up on their bottoms. I don't want others to experience the ordeal I have had with Verran; if there is a possible chance of avoiding this, then my effort will not have been in vain."

6 Oct

Wrote to Express Newspapers for help, as machine was obtained via McIntyre ad. in Sunday Express.

Wrote again to IEUG :

"There is something very funny about this business. I cannot understand Verran's attitude and it leaves me completely baffled."

16 Oct

Visited Express Newpapers, who then contacted Verran. "We are unable to get the part required for repair, and are therefore sending a new machine by return".

20 Oct

New machine arrives without any apology or explanatory note.

Verran cashed Mr. Ingham's cheque on the 27th August, and repeatedly told him his computer was under repair, even though they did not have the means to carry out the work. Only after pressure from Express Newspapers did they offer Mr. Ingham anything except stony silence or half-baked excuses. In light of this episode, Verran have stopped supporting the Enterprise. and alternative repair facilities have been found at :

T.E.I. Computers,
The Albany Works,
Queens Road,
Thames Ditton,
SURREY. KT7 ORE.

They have full circuit diagrams, have access to parts and one member of the User Group has already had his machine successfully repaired by them.

**Neil Blaber**

# FORUM—Piracy

As you may be aware, we are currently negotiating with software houses to allow us to produce conversions for the Enterprise of their best software. It was with some shock and disapointment, then, that we found some software houses were less than eager. It didn't seem to be the deal we proposed, rather it was the worry of piracy.

What has piracy got do do with us?

As a group, we at IEUG must take responsibility for all that occurs within our group at all levels. Piracy of available software is potentially disasterous for the computer industry as a whole, but more importantly it could bring the final death blow to the Enterprise.

Let me explain. Piracy is ANY kind of copying that deprives the producers of income (eg. copying a friend's tape). Software houses that sell very few copies of high quality software are very unlikely to want to produce more. They will also be very unwilling to give IEUG the source code to their to programs if they feel it is a waste of time. If piracy becomes a feature of the IEUG then it will surely die. Yes, a pirate may get a copy of every available software title, but he/she will ensure that there will NEVER be any more!

One other thing is important. There are a number of members interested in producing software for commercial gain. The User Group is a relatively small market compared to the world of other machines. Their profit margins are very small and one lost sale could make the difference in making it worthwhile. Please support in-house software and software from independent producers such as Boxsoft, they can't keep going without money.

As for the piracy situation now - well we have found no trace of any. Our meetings have been monitored, and apart from two 9 or 10 year old kids ( who were lectured severely - OUCH!), there was no attempt to get copies from other members. The spread-out nature of our users seems to have made it difficult for would-be pirates outside meetings. But just remember, it is up to all of us to keep our own houses in order.

## Software Availability

There aren't many places that software can be bought at the moment. We hope to remedy this soon, but in the meantime here are the places that Enterprise-specific software (as opposed to CP/M) can be bought:

BOXSOFT : See ad in this mag for titles. Boxsoft also sell hardware.

LEVEL 9 : If you're interested in adventures, then these are the people!

SILICON DREAM SERIES (Science Fiction)

Snowball

(best sci-fi adventure ever! - ISSUE 3)

Return to Eden

(Worthwile followup to Snowball - ISSUE 4)

MIDDLE EARTH SERIES (Fantasy)

Colossal Cave

(The GRANDADDY of adventures - ISSUE 1)

Adventure Quest

(The story continues... - ISSUE 3)

Dungeon Adventure

(Huge, difficult & excellent! - ISSUE 4)

OTHER ADVENTURES

Lords Of Time

(Possibly their best adventure - ISSUE 3)

Emerald Isle

(Modern & exciting - ISSUE 4)

All the above titles are available from Level 9.

IEUG : Greatest Hits Vol 1 (Vol 2 coming soon).

PS. Apologies to those who ordered Vol 1 but had to wait. This was due to us underestimating the demand. Sorry, we will get it right for Vol 2.

# PRIVATE Correspondence.

**gossip, outrage, it's your page.**

I have just discovered how to make the Enterprise go faster - believe it or not! All you do is type OUT 191,12 to speed it up, and OUT 191,4 to return to normal. I found the OUT at the very end of the Enterprise Technical Manual.

What it does is alters one of the registers in the Dave chip to remove the "wait states" from memory accesses, and consequently speeds the operation of the Z80 system by between 5 and 25%, depending on what it is doing at a particular time. Having said this, I am not exactly sure how or why it works, any help would be appreciated.

Unfortunatly it only seems to work on 128K machines, possibly because they have faster RAM chips in them, which can return stored data faster, and it is just possible it might not do the machine any good, so use it with care.

I am quite into amateur electronics, my latest project has been the design and construction of an EPROM programmer, plugging into, and controlled by my Enterprise. (EPROMs are Erasable Programmable Read Only Memories, similar to the ROMs in the Enterprise, only you can program them yourself using an EPROM programmer)

Unfortunately the design is too complicated to publish in "Private Enterprise", however anyone fairly well-versed in the art of construction could tackle it - please write to me if you are interested, or if you have built any add-ons for the Enterprise yourself I would be keen to hear from you.

I am offering an EPROM programming service to IEUG members, with very cheap rates, and EPROMs supplied if necessary - write to me for details.

Another thing you might be interested to know is that EXDOS, when used with a 5.25 inch disk drive, can read and write MS-DOS files compatable with the IBM PC and clones, I have successfully read disks from one on the other. You can only read IBM text files, and not use its programs though, but it can still be useful.

Finally - HELP!! Does anyone know the purpose of the Left and Right Hand Sound In pins on the expansion port. I have sent sound signals in but there seems no point to it. Secondly, how do you use the external colour inputs on the expansion port ? I have heard them mentioned in the same breath as " sprites", now wouldn't it be nice if...

Don't forget the EPROM programming service,

Andy Burnham, *
Elvyn Richards Hall, *
Ashby Road, *
Loughborough, *
LEICS. LE11 3UQ. *

DT: Thanks for the information and good luck with the Eprom programming service. Sorry, but we can't help you with your questions - if anyone reading this can, then write to us and we'll publish !

---

Could you please tell me what has happened to your magazine you promised when you sent out your last SHEET of paper. My son is wanting to purchase some more software for his computer but I have little faith left in your company after you not fulfilling your promises in your last newsheet. I have tried to trace your telephone no. but am informed the no. was disconnected in October.

I am writing to you now at Boxsoft to see if you have any further information as to the future of Enterprise Computers, or shall we just throw it in the bin and buy a more reputable and reliable computer from another firm.

Mrs. Darwell,
Orrell,
Wigan.

DT: I get the feeling you have got the IEUG confused with Enterprise Computers themselves, although we accept the blame for the late magazine (sorry). We are trying as hard as humanly possible to get some software out a.s.a.p. but were held up by delays in the sale of the Enterprise assets and by Neil moving down to Crowborough, which rendered him out of circulation for about three weeks. Enterprise-specific software is available from Boxsoft (see advertisement), and the Level 9 adventures are available from them directly at :

Level 9 Computing,
7, Kings Road,
Reading,
BERKS. RG1 3AR.

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# Private Correspondence

I've had an Enterprise 64 for quite a long time and I have been very impressed with it. I have found the lower case very useful, especially when I am writing letters with the bvuilt in Wrod Procescor. I like the Sinclair style case on the Enterprise but mine appears tp have been left somewhere rather warm as all the front has melted into a funny blobby shape and some of the keys have been replaced in different colours. The gear lever is in a very handy position but as yet I haven't been able to find reverse. I can only get my programs to go in one direction. I may but a copy of Forth as this is supposed to make it run backwards. The disc interface sounds useful as well, I have had problems with tapes, in particular I cannot get the Enterprise to load Dire Straits, even though the manual does say that it has stereo sound. I would like to know about the network. Do I need a license to transmit on the network and if so where do I buy it from ? I presume that the Post Office sell them like normal T.V. licenses. How many people are using the network ? I can't seem to pick anyone up but my aerial may be adjusted badly. The manual has references to 'files', is this because the holes at the back are not big enough ? The Enterprise does seem to get rather hot at the back. Surely if Intelligent Software realised this problem when they wrote the manual it could have been changed on the machine ! Can you help me with anything as I am getting a bit confused.

Mr Arnold Gibbon
Lower Endover
LEICS.

P.S. My friend has tried to make the video line table work in colour burst interlacing mode while concurrently interrupting the 17-bit polinomial ring modulation strobe from the external colour drain latch. Do you think Nick or Dave will know how to do this, and do you know their addresses ?

DT: No.

---

**Dear IEUG.**

**I have had an Enterprise Computer for almost a year now and have reached the stage where I can tinker around fairly well with IS BASIC but would like to speed things up. 'ZZZIP' seems to fit the bill but after reading your review in 'Private Enterprise' issue 6. I have a few questions. Firstly could you tell me if the 'loader program' reffered to has to be used every time I wish to speed up my IS BASIC programs and secondly as I have enough problems getting rid of bugs as it is let alone getting then out of a sophisticated 'compiled' program is ZZZip a little too advanced for me at present?**

**Yours**

**D BRENT.**
**ELTHAM**
**KENT.**

**Since this is to do with a Boxsoft program well let him answer.**

**I'll go through your queries in the same order as you brought them up. First the loader program is in fact a short basic program that loads in the main M/C it also doubles as a program duplicator saving you having to compile the program every time you want to make a copy of it. A point I'd like to add is you don't need the compiler to be loaded in every time you want to run your compiled program, it runs completly independantly. AS for the bugs you might enconter! There not really bugs, there just commands that are not covered by ZZZip and there only commands that make unusial use of non integer based maths etc. Of all the Basic programs I've tested over 70% have worked first time with no modification.**

**TIM BOX**

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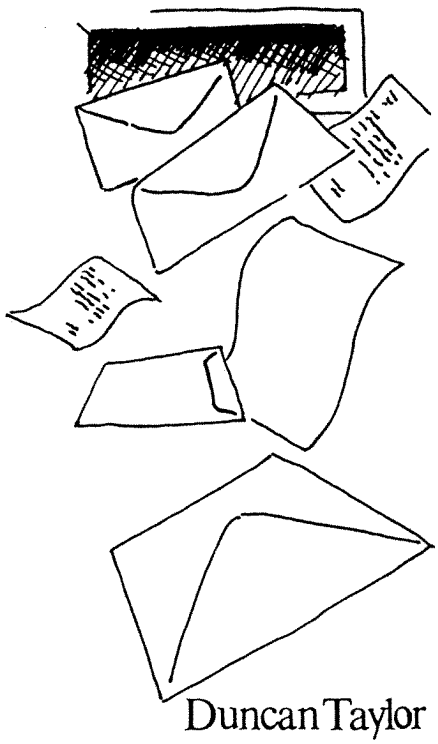


Duncan Taylor

# The Enterprise SAGA
## The Story So Far

We have received a number of letters from members expressing confusion over what happened, when and why in the chequered history of Enterprise Computers Ltd. Although everyone knows a little of what went on, gleaned from the pages of Private Enterprise and other publications, what is missing is a total overview. To this end, here follows the story of Enterprise Computers from conception to the present day as percieved by Eamonn O'leary; we hope it fills the missing pieces in everyones' jigsaw.

Following the phenomenally successful launch of the Sinclair ZX Spectrum, Locumals, a giant Hong Kong trading company, decided to cash in on the rich pickings of the booming home computer market by producing, through a second party, a totally new home computer. In September 1982 the United Commercial Bank approached Intelligent Software to develop such a machine for a 'mystery backer'. I.S. took up the challenge, and by the following month Project D.P.C. was underway. This development stage was shrouded in secrecy - D.P.C. standing for Damp-Proof Course as a red herring for any would-be snooper.

Whilst I.S. was formulating the innards, Geoff Hollington and Nick Oakley were appointed to create the outward appearance of the machine, and by February 1983 had produced a strikingly different shape. Unfortunately, a lot of the design team's forward thinking was compromised when, later on, I.S. decided to use a separate graphic design consultant who dismissed their two-tone grey format in favour of a primary colour coded scheme. Not only did this short-sighted decision fly in the face of the growing trend towards more professional-looking computers, but was to lead on to an unfortunate set of circumstances when it reached the shops later on.

Although the exterior was suffering from too many cooks, the internals were bubbling away happily. Nick Toop was busy designing a revolutionary 'soft' Uncommitted Logic Array (U.L.A.) chip. This square, custom-built 72-pin chip was to allow the most flexible and colourful display of any 8-bit home computer ever made. In unison with the development of the 'Nick' video chip, Dave Woodfield was creating a similar square U.L.A. chip, 'Dave', giving full stereo sound and the ability to address up to four megabytes of RAM or ROM.

For reasons of cost it was decided to use a rubber mat in place of an individually sprung keyboard, edge connector ports as opposed to sockets and the Zilog Z80A central processor rather than the faster Z80B. Cost was also the reason for the exclusion of an extra ROM chip from the circuit board which could have allowed the computer a built-in assembler and a more professional word processor.

The marketing wing of the operation was set up at the London office of Domicrest, an Anglo-Indian trading company, which was also involved in the venture by this stage. The first task was to decide upon a name for the company who were to produce this world beating machine and no doubt with an eye to its Far East origins, the name 'Samurai' was arrived at. However, Hitachi started producing a series of computers with that name, so it was back to the drawing board. For a while it was known as 'Oscar' but no-one really liked that, and so 'Elan' was the name the pre-launch publicity machine centred around. This proved to be the biggest mistake of all, for a software company of the same name took them to court. Whilst all this was going on during 1984, the newly-formed company decided to hedge its bet by naming the computer itself the Enterprise. Elan Software won the legal rangle and after a desperate attempt to not loose all the benifits of the previous publicity by calling the company 'FLAN' (which looked and sounded like Elan) they decided to finally admit defeat dropping this silly name and calling themselves Enterprise Computers.

Entersoft, the software marketing arm of Enterprise Computers, was set up soon afterwards to ensure (in theory) a free flow of programs from independent software houses and to promote the development of high quality programs designed to fully exploit the enormous potential of the machine.

Before the company's infra-structure had been decided upon, a decision was made to press launch the machine in September 1983 in an attempt to drum up publicity and dissuade possible customers from buying other machines. The computer was launched despite the fact that the IS-Basic language, which had been under development for two

years, had yet to be finalised and that the production of the specialised chips and manufacture by Crystalate Holdings had not been sorted out.

The Enterprise was to go on sale during April 1984 - the press and public were so impressed with the specification and value for money that the-then Elan Computers announced that by early 1984 pre-production orders for over 80,000 machines worth 20 million pounds had been made. Entersoft planned to have around a dozen programs ready for sale at the same time, and everyone waited with baited breath, which by July 1984 became a sigh and by December 1984 a yawn - it was late.

Pre-launch publicity is a dangerous business; one must take all things into account before committing oneself to a date; the media was rightfully sceptical of Enterprise Computers' far too optimistic target date and were now busy telling the public 'I told you so'. Untold damage had been done to the company's image, much of the previous interest had evaporated along with the pre-production orders, by the time the Enterprise finally arrived in any numbers, nine months later in January 1985.

The world that the Enterprise launched into was far more hostile than it would have been back in April 1984; the public was far more conservative, critical, cynical and price conscious; the golden years of home computer sales were over. The rival competition was keener also and although the Enterprise still stood head and shoulders above the rest, it would have to prove itself.

Now was the time for the marketing arm to show its true colours - unfortunately these colours were green and yellow. Green because they hadn't put the wasted time to good use ( instead of three times the amount of software originally intended at launch date (12), they produced a pathetic third of that figure (4) and instead of an eye-catching machine code point-of-sale display they had only the awful IS-Basic introductory cassette), and yellow because they chickened out of a massive 2.5 million pound advertising campaign through Low Howard-Spink which was planned to start with an initial phase costing £50,000 in late February.

Probably it was decided during the delay to low-key launch the 64K model and bring forward the 128K model launch. This machine would be more instantly competitive in the market place than the 64K, and the advertising was to be delayed to coincide with its introduction.

Those faithful few who waited from the original launch announcement to the 64K machine's arrival were met by an unnecessary 25% price increase (when the competition were lowering theirs) that only helped damn its name even more in the media, who by now were going off the management of the company rather fast.

The folly of the price rise came home to roost when it was admitted that prices had to come down. This coincided with the bungled changeover from high volume manufacture at Welwyn to low volume production at GRI of Perth, Scotland. The result of these two factors was that the trade saw prices drop in the shops whilst the manufacturing had, as far as they knew, come to a halt. Everyone presumed Enterprise Computers were going under, all because they charged an unrealistic price to start with and didn't inform the press of the change in production base early enough.

Another nail in the Enterprise coffin was the fact that the general public could not tell the Enterprise 64 from the Amstrad CPC464, which had arrived (on time) three months earlier. The reason for this takes us back to the colour scheme chosen by Enterprise - i it was a coincidence that both machine looked similar, it was a most welcom one for Amstrad who benefitted fro most of Enterprise's pre-launc publicity. If, however, it was b design that the CPC464 was coloured t mimic the Enterprise, shown to th press six months earlier, then Ala Sugar must be given due credit for marketing masterstroke. Not only di Amstrad gain, but the Enterprise whe it arrived seemed from the outsid nothing more than a spartan imitatio of the Amstrad.

By the time the 128K model was read for introduction, Enterprise wer committed to their colour scheme, fa too many 64K machines had been produce by Welwyn Electronics in anticipatio of the original demand, and Enterpris were frantically modifying 64K machine for sale as 128K's outwardly changin only the name panel and the joystic knob from green to grey.

The media advertising, when it arrive was a shadow of that first envisage during May only £250,000 was spent press ads promoting the expansi system that didn't exist and the T.V commercials promoting the stereo sou when there was no software available adequetely demonstrate it. This s comedy of errors put the trade rig off the Enterprise.

By this time the money was running out the disasterous launch, legal battle and production delays had all take their toll. Despite the fact tha Enterprise was operating at this stag in 15 different countries includin Eire, France, Germany, Scandinavia South Africa and Australia, it wa England that accounted for the bulk o all home computer sales outside th U.S. and unless there was softwar there was little to entice people t

buy the computer.

Promise after promise of software never matched the reality - 'Forty programs by January 1985','A hundred programs by January 1986'... Unable to persuade software houses to produce dedicated Enterprise programs without the incentive of huge commissions, Enterprise concentrated upon the EXDOS unit which would allow CP/M compatibility and thus software availability.

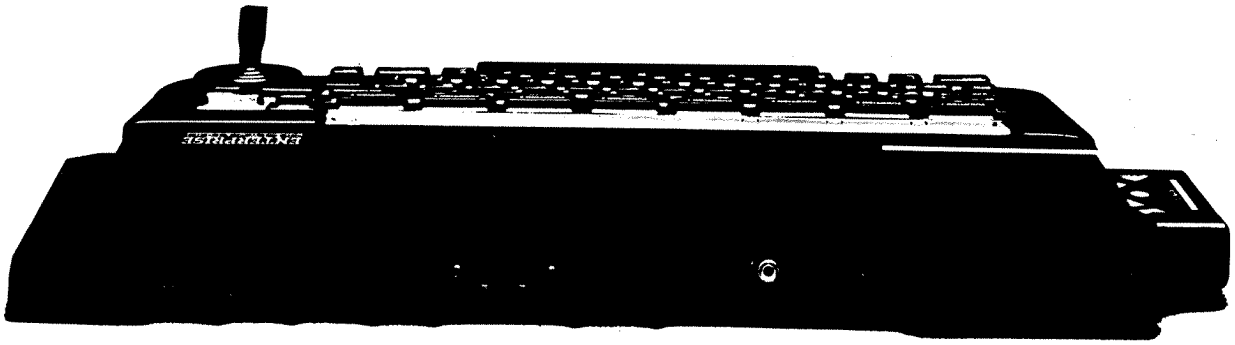
By the time EXDOS arrived (February 1986) Enterprise was in distribution difficulties and had to generate sales through mail order and small ads. In a last-ditch attempt to get out of the doldrums Enterprise approached Dixons with a new machine, the PW360, designed to compete directly with the Amstrad 8256 in the crucial pre-Christmas sales period. For reasons best known to Dixons, the deal dissolved and the decision to liquidate Enterprise Computers Ltd. was taken by the United Commercial Bank on June 18 1986 leaving debts of approximately £8,000,000 and were put in the hands of Grant Thornton receivers.

So were does all this leave us? Well in a better position than you might at first think. The Enterprise represents today's state of the art 8-bit microcomputer. The medias love affair with 16-bit technology is not what it once was and even 32-bit systems are only noted for there running speeds and limited multitasking capabilities rather than any earthshattering innovations. As it is the software that dictates how well a given computer will perform a task and 16-bit programs have yet to present enough advantages over the tried and trusted 8-bit standard, many experts agree that it is not really worthwhile for enthusiasts, as opposed to buisness and specialist users take a gamble with first generation 16-bit offerings is doubly so for those starting out. Who are not adequatly catered for at all outside the 8-bit computer world. MS DOS software cost astronomical amounts when comared with CP/M which, especially under IS-DOS, offers a large well developed and affordable software base. In short, many have home to the conclusion that a good 8-bit micro is still far better, and cheaper, than an underdeveloped 16 bit one.

Only the Enterprise is in a position to take full advantage of the 8-bit renassiance now taking place. Competitors like Commodore, Atari and Sinclar focused there attention on the 16-bit market too early only to regret they had forsaken there roots. Sadly every Christmas they repackage outmoded 8-bit systems add a few gimicks, and pray that a large existing software base will entice the unwary to finance the development of there still to be sucessful 16-bit hopes. The exeptions Acorn and Amstrad have either overpriced non CP/M dedicated systems or down-to-a-price, non standard disk dedicated systems.

The slogan 'With obolesence built out' may today seem somewhat ironic, yet it is only now that the Enterprise is coming into its own. Already professional programers (many IEUG members) are designing dedicated pakages to utilise the computers finer points and the present dearth of games software will, with the development of the Spectrum Emulation Unit, no longer be a problem.

We have all hade a rough ride over the last two years, especially those new to computers who have been treated worse than most, but as I write there are developments going on behind the scenes. It would, in the light of the Dixons news leak, be unwise to say more execept that, depite the calamities of the past, action is being taken to ensure the future will see the Enterprise reach it's full potential. I don't know about you, but having come this far, I am staing on board for the ride and am greatly looking forward to the next few months.



## A long hard look

# IS-DOS

Enclosed with the Enterprise disk interface, EXDOS, was a registration card to be sent back to Enterprise. When Enterprise received this card they would send back a disk with IS-DOS on it. The reason for not enclosing this disk with EXDOS was that different users were bound to have different disk drives, 5.25 inch, 3.5 inch etc. All the above is of course in the past tense as Enterprise no longer exist, although IS-DOS is still available when purchasing EXDOS units.

As mentioned earlier, IS-DOS is supplied on disk and has to be loaded into the computer to be used, unlike EXDOS which sits there on ROM and can be called without destroying a program or word processor article. This is really a very minor inconvenience when you look at the advantages of the system.

The biggest plus is that IS-DOS allows you to run MOST CP/M programs on the humble Enterprise. Consult the CP/M Page elsewhere in this issue to see the amount of software this makes available. Suffice to say that it will allow you to run such classics as Wordstar and dBASE II, providing you can get the programs in the right format. IS-DOS screen handling performs in the same way as a VT-52, one of the industry standards for terminals, and so makes installing programs on the Enterprise reasonably easy.

IS-DOS uses all of the commands provided by EXDOS, and has several of its own. These include a command, ATTR, to make files 'read only' so that you can't delete or overwrite them accidently, and to hide files so that they do not show up on directory listings. Directories can also be hidden by use of the ATDIR command. Other commands are provided to allow you set up your drives any way you like, so that you could for instance have all accesses to drive B: go to the RAMdisk (drive E:) instead, or pretend that you've got three drives with drive B: acting as drives B: and C:. This feature can be particularly useful if one of your drives goes faulty on you. Incidently, if you only have one drive IS-DOS automatically uses the above commands to set up drive A: as drives A: and B:.

There is also a full on-line help facility, HELP, which allows you to access details on any EXDOS or IS-DOS you are confused about, and allows you to create entries of your own. To make use of HELP, there must be a directory called HELP on the disk you are currently using (there is such a directory on the IS-DOS system disk supplied with EXDOS) which contains a number of text files with the extension .HLP. When you type "HELP FORMAT", for example, IS-DOS looks for a file called FORMAT.HLP in the HELP directory and prints it on the screen. These files can be created on the word processor, so the amount of HELP you have available can be as large as you like.

When using IS-DOS you have a choice of a 40 or 80 column screen. You can also choose whether you will be using a serial or parallel printer, and which devices will be used for auxiliary input/output directly from IS-DOS. This,along with such features as allowing you to show the path name of the directory you are in (\BASIC for example) instead of the standard A) prompt, and being able to set up the disk buffers to whatever size you want all help to make the working enviroment that much nicer and easier

To save you from having to set everything up just the way you like it every time you go into IS-DOS, there is a facility that allows you to set up a batch file that will run automatically every time IS-DOS is booted up (loaded from disk). Simply write your batch file on the word processor and print it to a file called AUTOEXEC.BAT, which works in the same way that the file EXDOS.INI works from EXDOS.

Batch files in IS-DOS may also have parameters (variables) passed to them. This is done by using %n in the batch

# A long hard look

file, where n is a number between 1 and 9. As an example, if one had a batch file called 'SWAP' :-

```
COPY %1 DUMMY.DUM
COPY %2 %1
COPY DUMMY.DUM %2
DEL DUMMY.DUM
```

Then the command SWAP FILE1 FILE2 would swap the contents of FILE1 and FILE2. Variable %1 in the batch file is replaced by FILE1 and %2 by FILE2. If %0 is used then the name of the batch file itself is inserted.

Also on the IS-DOS disk are a number of files ending in .COM; these are transient commands that, when called from IS-DOS, perform various complicated tasks. They are used in the same manner as the built-in EXDOS and IS-DOS commands, except that the relevant .COM file has to be on a disk you are currently using. There are 5 transient commands provided with IS-DOS : BACKUP, CHKDSK, DISKCOPY, UNDEL and XDIR.

BACKUP allows a backup of a disk, or part of a disk, to be made. As well as copying the files over it will put them on contiguous tracks on the destination disk, which can speed things up greatly if the disk you are copying is one you use often as a work disk. BACKUP has an option which marks files as having been backed up; this mark is removed when a file is written to. This means that if you backup the disk again with the correct option it will only copy files that have been altered since the last backup. Amongst other features you can also decide whether the destination files are given the current time and date or those of the original file.

DISKCOPY does much the same thing except it makes an exact copy of the disc, errors and all.

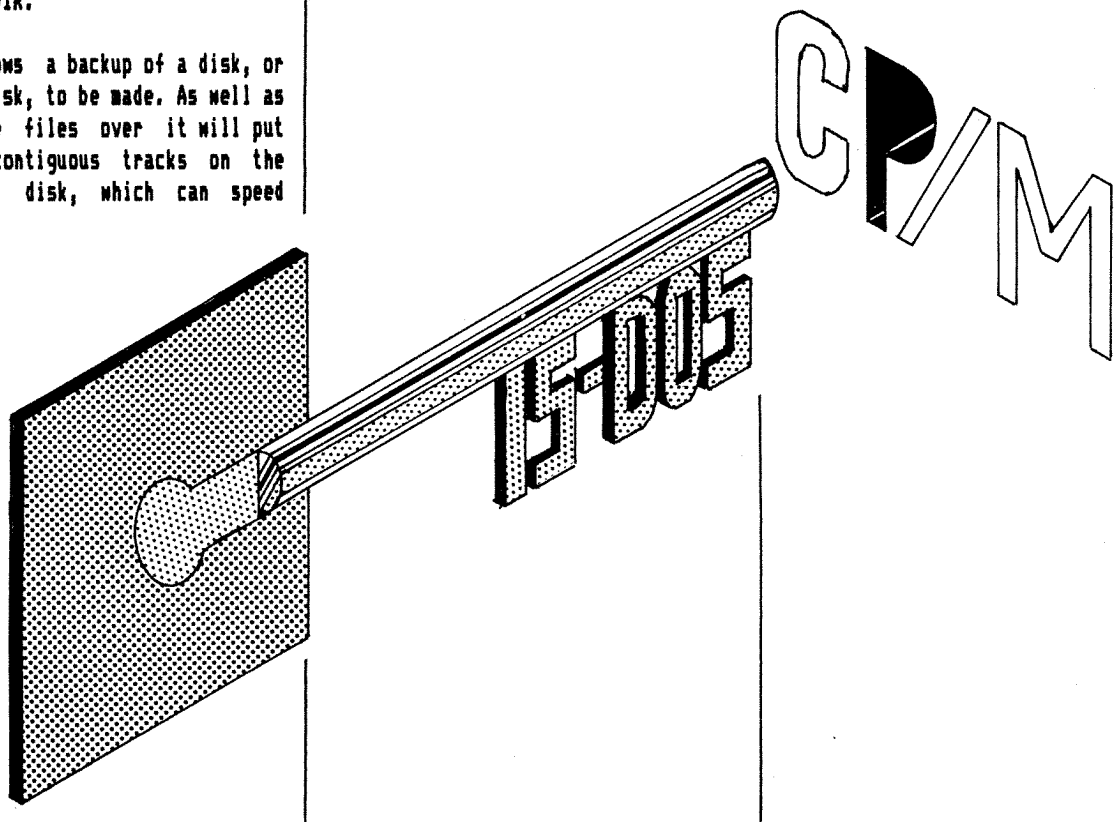
CHKDSK allows you to check your disks for errors and hopefully recover any lost space on a disk.

UNDEL is a very useful command that allows you to recover a file if you accidently delete it, provided you haven't written anything else to the disk in the meantime.

Finally, XDIR gives you a complete disk directory including the contents of every sub-directory. This coupled with the fact that IS-DOS provides a command that makes the printer echo everything on screen allows you to get hard copies of all the files on a disk.

As you can see after this brief look, IS-DOS is even more versatile than the excellent EXDOS, and provides even more power to the best 8-bit around.

DAVE RACE



# The CP/M Page

**By Neil Blaber**

Right, if you thought the mag up to here had been positive, prepare to have your socks blown off. While you lot thought I was off having a quiet snooze somewhere instead of preparing the mag, I have been rather busy sorting out the goodies below. For those of you with disk systems, first a bit of bad news followed by lots of good - for those without disk systems, write to Boxsoft for details on EXDOS units, and write to me at the new IEUG address for inclusion in my mailshot when I finalise details on the NEW DISK DRIVE OFFER.

## *IS-DOS Bug*

A bug has been discovered in IS-DOS which will prevent certain CP/M programs from running properly. This bug affects any program which reads the disk directly for the purposes of determining free space, and has the effect of indicating that the disk is full. However, this is not a irrepairable bug and we should be able to distribute a patched version of IS-DOS sometime in early 1987.

## *CP/M Public Domain Software Now Available*

All CP/M Public Domain software available from P.D. SIG is now available to IEUG members from me at the following rates :

£2.50 per volume for 1-9
£1.75 per volume for 10+

Media can also be supplied :

£1.75 per 5.25" (DS) disk
£3.00 per 3.5" (SS) disk
£4.00 per 3.5" (DS) disk

Postage and packing costs :

50p for 1-3 disks, then 7p per disk after that.

There are approximately 600 volumes (1 volume = approx. 200K) in the P.D. Library which include compilers, assemblers, games (no graphics), word processors and editors, business applications and general utilities.

A printed synopsis catalogue is available free if you send a stamped-addressed envelope to IEUG Public Domain Software at the new address.

The complete detailed catalogue is available on disk together with a number of handy utilities (which I guarantee will run on the Enterprise) for £5.00 (it actually comprises 3 P.D. SIG volumes). Ordering software from this catalogue will be a "hit-and-miss" affair, as a proportion of this software will not run on the Enterprise (for example comms packages), and other software may need installing before it will run correctly (CP/M hackers take note - tweaking these programs is highly addictive !). I am in the process of building an "IEUG" library of installed software guaranteed to run, and should be able to make the first volumes available soon. Please make cheques payable to Neil Blaber and send them to the address below :

IEUG PUBLIC DOMAIN SOFTWARE,
**P.O. BOX 13,**
Crowborough,
E.SUSSEX. TN6 1QX

## *Disc Format Service Out Now*

Also, I am now able to offer a disk format translation service between almost any machine capable of running CP/M and the Enterprise. Before rushing out to buy tons of commercial CP/M software to be translated across to the Enterprise, please :

(1) Check the copyright restrictions, as this service is provided only on the basis that I, or the User Group can accept no responsibility for breaches of copyright occurring.

(2) Read the IS-DOS manual and remember the limitations of IS-DOS before forking out money on expensive commercial software that might not run. I can only translate the disk format, I can't magically transform any old program to run on the Enterprise if it does things that IS-DOS can't cope with.

Translation charge is £5.00 per source disk including first class return postage - media can also be supplied at the above rates. If you want the program installing and testing in addition to the translation, prices are negotiable depending on the difficulty of the job. By the way, if anyones got any CP/M stuff on 8" disk they want translated, I can do those as well ! As per Public Domain, cheques payable to Neil Blaber and send to IEUG DISK FORMAT TRANSLATION at the new address.

As far as commercial CP/M software which will definitely run on the Enterprise goes, I will be building a directory of these as things progress - so let's have some feedback ! Programs I have seen running include WordStar (including MailMerge), dBASE 2, SuperCalc, SuperWriter, Hisoft's Pascal-80 and Devpac-80, Borland's Turbo Pascal, Microsoft Basic and the Infocom adventures.

## *New Disc Drive Offer*

I am currently in negotiation with Cumana to revamp the old IEUG Disk Drive Offer in such a way that the hassles people experienced last Christmas aren't repeated. Prices are not ready at time of writing, so if you want to be among the first to know when the thing is sorted out, send me a stamped addressed envelope (9 x 4") to be included my mailshot. Send your enquiries to IEUG DISK DRIVE OFFER at the new address.

# The P.D. Software Library CP/M Installation Pack.

**********

Winscombe House,Beacon Rd., Crowborough Sussex, TN6 1UL tel 08926 63298

Since we began providing a disk format translation service and supplying the various public domain software libraries, there has been one common question which gets asked time and again. 'How do I install ——' for my '——'. Usually the program is Wordstar, Supercalc, Dbase II, Cardbox or some other well known CP/M program and the computer could be anything from an ACORN Z80 BBC to a ZORBA. It may be a situation where you are just changing computers and need to install your software for the new machine. Or maybe you have just got a new machine and want to install some of the Public Domain word-processor, database or whatever programs on it. Whatever your situation, installing programs can be a problem even for experienced users. Help is difficult to get as the usual 'trade protectionism' thing makes it very hard to get information from dealers & software houses. We have produced a small book and a disk of software with the 'tricks of the trade' on this subject, which should enable you to tackle virtually any installation job. No prior programming experienced is assumed, familiarity with the normal CP/M commands is desirable. The main prerequisite is common sense and willingness to have-a- go.

It covers routine installation plus such things as:-

What to do if your machine is not on the install menu.
How to get a program running even if you have no install program.
Handling Overlay type installations.
The complexities of inverse video.
What the screen control codes do.
The oddities with Torch.
Keyboards & printers
How to Patch a program & Setting Bits.
Addresses to Patch for Dbase II, Supercalc
A Very extensive list of Patch areas for Wordstar 2.26, 3.0, 3.3

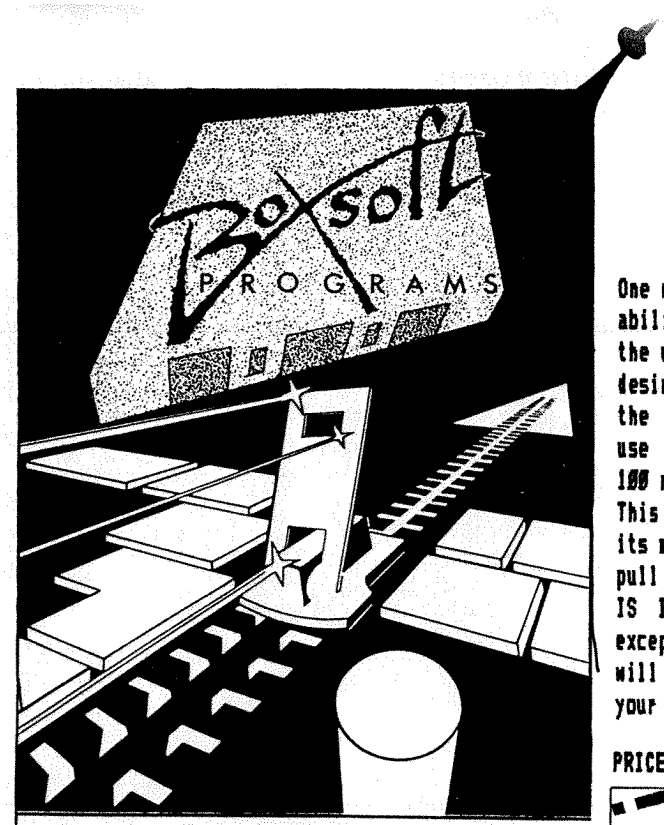
There is also a list of many of the terminal types showing the screen codes they require and a very useful HEX - DECIMAL - BINARY conversion table. Because the CP/M documentation supplied with some machines is so poor, we have included quite a large section on CP/M itself and cover some of the rarely mentioned things such as the Bios & Bdos vectors & functions, plus a full definition of all the usual commands.

SOFTWARE TOOLS DISK

This is supplied free of charge with the book. It contains all the software tools you are ever likely to need, even for the most difficult installation. It is most unlikely that you will have to dis-assemble your program in order to install it, but the tools are there if you need to.
The programs include:-

A modification for Wordstar to allow any printer code to be sent from a document so that the full printer facilities can be used.
Binary file compare utility
A Program to modify CP/M 2.2 programs for CP/M plus (if needed)
DU87 the best Disk Editor for CP/M & CP/M plus
Improved CP/M 8080 assembler (ASM.COM) & Load (LOAD.COM)
Editor for any kind of file Text or Program.
Improved version of DDT the 8080 de-bugger Plus a Z80 De-bugger
Program to re-define your keys.
Z80 Assembler with Hex output also Reverse Assembler
Z80 Assembler with RELocatable code output with matching Linker

Price- INSTALL PACK is £9.00 Plus P+P 34p. This does not include the Media for the software, you supply that. Send us a formatted disk from your machine and we will copy the software onto your disk. On the formatted disk put a text file of 30k or more and PIP.COM. This is so that we can check we have the right format set for your machine. If you can not send us a formatted disk we can supply media, 5" at £1.75 and 8" at £2.00, but there is a chance of us getting the wrong format this way. If you have small capacity disks send enough to hold about 250k.(price for members is £6.50 +P&P)




## ZZZIP

### IS BASIC INTEGER COMPILER

'Open up' your Enterprise computer by dramatically speeding its powerful and flexible IS BASIC language.

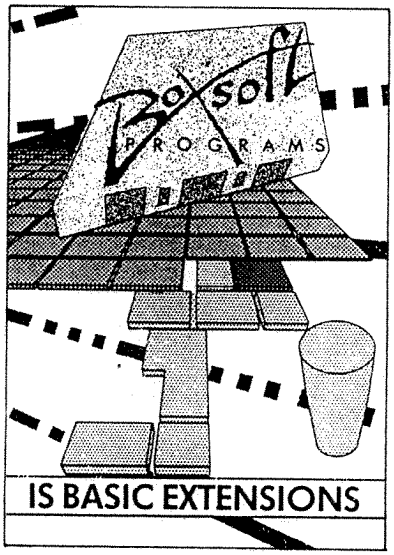
Simply load ZZZip before the program you want compiled and this comprehensive compiler will cover 90% of all functions and commands including normaly non intiger functions such as SIN and COS resulting in speed increases of up to 5000%.

Once compiled IS BASIC programs can be saved and loaded like like any other yet will run faster instantly.

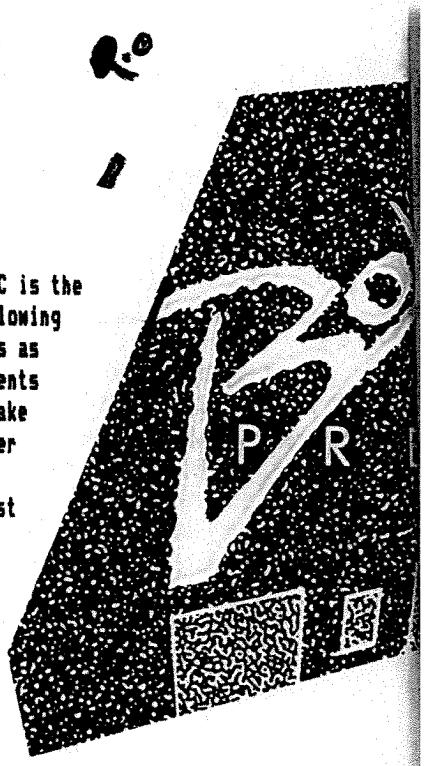
PRICE £12.95

One of the built in features of IS BASIC is the ability to be infinatly extendable allowing the user to add compleatly new commands as desired. IS BASIC EXTENTIONS represents the first commercial package to make use of this capability. Offering over 100 new commands and 20 new functions. This facinating program gives you amongst its many options; software sprites, pull down menu's and an assembler. IS BASIC EXTENTIONS represents exceptional value for money and will greatly enhance the power of your programs.

PRICE £7.95




### IS BASIC EXTENSIONS



The Enterprise's 'DAVE' microchip the best stereo sound facilities of a computer.

Making full use of EXOS'S control extremely powerful chip, 'SOEV' has bee to allow you to utilise its maximum more readily within your own programs.

Boasting among it's many feature envelope displays, full style and sym save/load and auto program generation.

'SOEV' is sold in four different ver a 128k applications program to a 64k system extention. All in all, 'SOEV' for all programmers.

For 64k and 128k En

P

# UNDER DEVELOPMENT

## *Sinclair Emulation Unit*

The most advanced peripheral yet to be invented for the Enterprise computer (with the exception of Exdos). Simply plug it into the expansion port and suddenly the Enterprise believes its a Sinclar Spectrum, allowing virtually all Spectrum software and hardware to be used! In one fail swoop your computer gains access to the largest software/ peripheral base of any computer in the U.K. today. It's not to be confused with the Basic to Basic translator which only works in a limited way on Spectrum Basic. This unit actually emulates the total computing capabilities of the Spectrum Computer without any modifications by you what-so-ever, allowing almost 100% software compatability.

The unit has a separate speaker to match the sound output more faithfully. It also has it's own cassette ports and edgeconnector for peripherals. The only difference users may notice is a slight speed increase; but who's complaining.

Santas going to be a little late this Christmas because the BoxSoft elves are rigorously testing and improving so as to ensure user-satisfaction early next year. You can, however be assured that at our prices it will be a gift. Hand up all the wallys who gave up on the Enterprise and splashed out on a Sinclair...feeling sick?

## *Intelligent Joystick Interface*

Dissatisfied with Enterprises own joystick interface? So were we, that's why weve designed this sophisticated alternative, an 'intelligent' connector that enables you to make use of all the potential your joystick has to offer from two fire buttons to auto repeat.

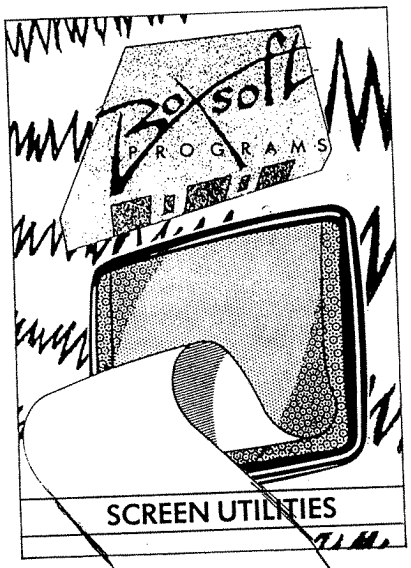
## *256k Internal RAM Card*

Increase the Enterprises RAM from 64K 128K to 320K with our custom-designed R card.

# OUT SOON

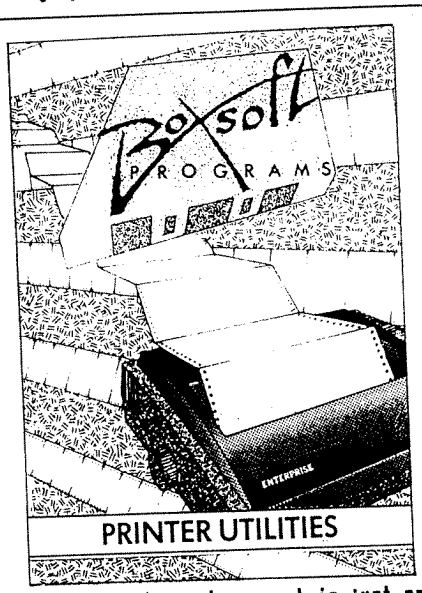
## Disc Utilities

Direct disk access and sector editing have long been desired by serious users. Now scrambled directorys can be saved from oblivion and lost files reclaimed. This together with other utilities will enable you to salvage you corrupted disks.

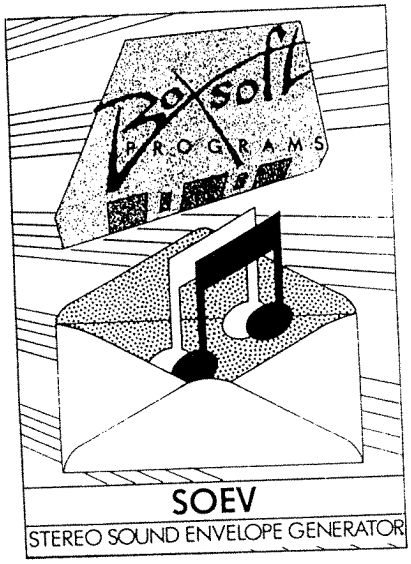



This dedicated transfer software permits full use of EXOS channel based achitecture giving many advanced features such as 256 shading, invert option and automatic channel opening. With its speed and flexibility SCREEN UTILITIES offers a very accessible video transfer system.

PRICE £5.95




Wordprocessing enhancement is just one of the major benefits offered by this device driver. From within a document you can now fully exploit your printers capabilites and make use of a 12K RAM buffer that will free the computer whilst still producing hard copy.




# OUT NOW

## EXDOS & IS-DOS

What is there to say that has'nt been said in issues 3,4,5 and 7 of Private Enterprise except to quote Dave Race's conclusion "BUY IT!!"

PRICE £80.00 including IS-DOS

Please note stocks are getting low so hurry!

## Printer Cable

£12.80

## Mouse plus 'Paintbox'

At long last a mouse utility is nearing completion and compared with the 'Aztec two-step' it is well worth the wait. A very high quality mouse (as used by the Amiga computer) and mouse interface comes with 'Paintbox' an allmode, all size art package offering a miriad of features including freehand, line, circle, ellipse, spray, copy, save/load and scrdump.

The use of the mouse doesn't stop at 'Paintbox' though. The extremely powerful and ingenious software supplied with this peripheral enables you to make full use of multi-mode mouse driven pointers, within your own programs.

As BoxSofts aim is of continual program improvement,'Paintbox' is an upgradable software package. As new and more enhanced versions become available, they can be purchased at a very reasonable (Upgrade) price.

This total concept is being designed especially for the Enterprise.

For 128K Enterprise owners only

This memory expansion takes the place of the 64K expansion board inside your machine allowing over 300K of user memory to both 64K and 128K Enterprise computers without encroaching upon the expansion port or your desk space. Fitting can be carried out by a competent user or, if you wish by sending you computer to us.

£15 + 64K + EXOS

# SOFTWARE ARCHIVE

## I'm Going Underground

Name : WRIGGLER
Producer : Romantic Robot
Category : Arcade
Price : £7.95

The Annual Maggot marathon is underway yet again, and you (a rather cute worm) have been conned into entering. The course consists of four large mazes containing loads of jimmies just waiting to mash you, and objects which will need to be used in order for you to complete various sections of the game.

The first problem you will come across is one of sustaining your energy. This drops at a fairly rapid rate (especially when you accidently bump into a nasty !) but can be replenished by consuming various foodstuffs found lying about (milk shakes, cups of tea, bowls of cherries, you know - normal maggot diet). Food need not necessarily be eaten immediately - it can be carried, as can other objects which will be discovered as the maze is explored. These objects are very useful, examples being tins of ant replellant (aha ! the maggot strikes back !), keys and a parachute (!). However, only one object (or piece of food) may be carried at a time - unfortunate if you're surrounded by ants and you've just swapped your ant spray for a milkshake!

The four main areas are 'The Garden' (a complex maze), 'The Scrubland' (a maze where you can relax and replenish your energy), 'The Underground' (another huge maze but with moving bits and a drop to Hell if you mess it up), and finally 'The Mansion' (guess what ? another maze, but this time with a lift and lots of keys and doors).

The game is never the same twice - it is set up differently every time it is run. The control keys can be user defined, or internal or external joystick can be used.

All in all, a very large (256 screens) maze game with arcade and adventure (ish) elements which runs a little sluggishly, due to the position of various nasties being tracked even when off screen to maintain consistency. If you enjoy maze games, this one will take you rather a long time to complete, and is well animated (the large spider is wonderful !). The colour scheme is, well, a bit biased towards brown, but then again I suppose gardens and scrubland are fairly brown !

Not really enough action to keep my interest. Dodging ants and other nasties is okay for a little while, but there's a lot of empty space in between things happening. The music on Side 2 of the tape is quite good - pity it wasn't played during the game. I'm not really a maze game buff, and the addition of objects to the plot didn't really add enough to pull it out of the "bog standard maze game" category. A bit expensive if you're not a maze game fan.

| | |
|---|---|
| Game Content | 55% |
| Playability | 55% |
| Graphics | 60% |
| Sound | 20% |
| Value For Money | 55% |

## On The Right Track

Name : Orient Express
Producer :
Category : Strategy/Arcade
Price : £7.95

This is a great little game and one that is very addictive. You play the boss of a track laying gang whose job it is to repair the track that saboteurs have blown up, before the Orient Express reaches it and meets an untimely end, thus putting a stop to its' attempt to break the Trans-European record. It may sound simple but think again.

The game is based on a sliding square puzzle and you move the squares around via the joystick to place the track in a secure position enabling the train to reach a station.

You can halt the train for up to 60 seconds by pressing the space bar (or if using an external joystick by the fire button.) This is not a long time and you really have to move it!
However, you cannot do this more than once in one journey, unless you don't use the full time allotted, in which case, you restart the train by pressing the same options, as before. If you pass over a square containing coal or water you will pick up bonus points.

The more squares you use or the longer the track, obviously the more points you will acquire. Each run has a different layout and a tip for all of you would be Casey Jones' is to get the train running on a loop, so you can build the track around it!! ( Cheat)

The other great asset to the game is the sound, which incorporates a catchy, well-defined tune, with the real puffing sound of a steam train.

You can almost smell the smoke! (No hold on, it's just my Enterprise overheating.) This can be turned off, but, I don't think you'll want to.

The graphics are bright and support the game well, the train is excellent to watch in motion and may I say, explodes quite brilliantly, when the track is broken.

Orient Express can be played with up to 4 players and can guarantee hours of fun. So for all of you whose life is on the rails and feel your station has passed you by (groan), go out and buy Orient Express, you won't be sorry, just extremely busy.

| | |
|---|---|
| Game content | 78% |
| Playability | 85% |
| Graphics | 68% |
| Sound | 85% |
| Value for money | 78% |

## You've Had It, Mate!

| | | |
|---|---|---|
| Name | : | CYRUS CHESS II |
| Producer | : | Intelligent Software |
| Category | : | Strategy |
| Price | : | £12.95 |

For all of you chess playing enthusiasts out there, this game is a must. The numerous facilities for the playing of Cyrus Chess are highly versatile and will suit an absolute beginner or indeed, a grand master. Either way your game will be educational and satisfying.

There are 9 levels of play, each answering your moves a bit slower than the previous one, but, unlike some other chess programs where you can wait for up to 10 or 12 hours for a reply, the longest time to wait with Cyrus is only 3 minutes 30 seconds!

The full screen playing area incorporates bold, well-defined graphics, making the pieces easily recognisable. The sound can be turned on or off.

You can play a user-to-user game, as well as pit your wits against Cyrus. During play you can ask for suggestions by pressing the 'H' key, giving you a hint for your next move. But beware, on the lower levels this can be a bad mistake as Cyrus tends to save its' own neck, rather than spare yours!

An automatic game can be played but you have to be quick to note the moves. If you make a mistake and wish to retract a move, this can be done also (cheating though it is) giving you another chance.

There is one great facility in Cyrus, that I found amusing. If on the higher levels you don't want to wait for Cyrus to reply, by pressing the 'STOP' key, you force Cyrus into making his best move, so far computed, (this is rather like hitting your opponent around the head, when he takes too long!). Obviously, this can mean a bad move for Cyrus, so giving you an advantage.

You can..change sides during play.and invert the board so you are still playing in the same direction. Nifty eh! Cyrus will also replay a whole game, so you can dwell on your victory, a little longer.

There are three further levels of play;
1) Adaptable - where Cyrus will play at the same rate as its' opponent.

2) Infinite - where Cyrus will carry on computing its' move until you press 'STOP'.

3) Problem - Cyrus will try to force Chechmate in 5 moves or less.

The game can be transferred as it is played to a number of extensions, such as.. printers.disk. tape etc.. thus making excellent 'use' of the EXOS system.

You can leave the program temporarily, in order to use the Word Processor, return to BASIC, or use some other extension you may have loaded and then return to play.

All in all, Cyrus Chess II is a very good strategy game and because of its' facilities and adaptability, well worth your pennies. It's your move!

| | |
|---|---|
| Game content | 75% |
| Playability | 88% |
| Graphics | 68% |
| Sound | N/A |
| Value for money | 68% |

You can almost smell the smoke! (No hold on, it's just my Enterprise overheating.) This can be turned off, but, I don't think you'll want to.

The graphics are bright and support the game well, the train is excellent to watch in motion and may I say, explodes quite brilliantly, when the track is broken.

Orient Express can be played with up to 4 players and can guarantee hours of fun. So for all of you whose life is on the rails and feel your station has passed you by (groan), go out and buy Orient Express, you won't be sorry, just extremely busy.

| | |
|---|---|
| Game content | 78% |
| Playability | 85% |
| Graphics | 68% |
| Sound | 85% |
| Value for money | 78% |

## You've Had It, Mate!

Name : CYRUS CHESS II
Producer : Intelligent Software
Category : Strategy
Price : £12.95

For all of you chess playing enthusiasts out there, this game is a must. The numerous facilities for the playing of Cyrus Chess are highly versatile and will suit an absolute beginner or indeed, a grand master. Either way your game will be educational and satisfying.

There are 9 levels of play, each answering your moves a bit slower than the previous one, but, unlike some other chess programs where you can wait for up to 10 or 12 hours for a reply, the longest time to wait with Cyrus is only 3 minutes 30 seconds!

The full screen playing area incorporates bold, well-defined graphics, making the pieces easily recognisable. The sound can be turned on or off.

You can play a user-to-user game, as well as pit your wits against Cyrus. During play you can ask for suggestions by pressing the 'H' key, giving you a hint for your next move. But beware, on the lower levels this can be a bad mistake as Cyrus tends to save its' own neck, rather than spare yours!

An automatic game can be played but you have to be quick to note the moves. If you make a mistake and wish to retract a move, this can be done also (cheating though it is) giving you another chance.

There is one great facility in Cyrus, that I found amusing. If on the higher levels you don't want to wait for Cyrus to reply, by pressing the 'STOP' key, you force Cyrus into making his best move, so far computed, (this is rather like hitting your opponent around the head, when he takes too long!). Obviously, this can mean a bad move for Cyrus, so giving you an advantage.

You can..change sides during play.and invert the board so you are still playing in the same direction. Nifty eh! Cyrus will also replay a whole game, so you can dwell on your victory, a little longer.

There are three further levels of play;
1) Adaptable - where Cyrus will play at the same rate as its' opponent.

2) Infinite - where Cyrus will carry on computing its' move until you press 'STOP'.

3) Problem - Cyrus will try to force Chechmate in 5 moves or less.

The game can be transferred as it is played to a number of extensions, such as.. printers.disk. tape etc.. thus making excellent 'use' of the EXOS system.

You can leave the program temporarily, in order to use the Word Processor, return to BASIC, or use some other extension you may have loaded and then return to play.

All in all, Cyrus Chess II is a very good strategy game and because of its' facilities and adaptability, well worth your pennies. It's your move!

| | |
|---|---|
| Game content | 75% |
| Playability | 80% |
| Graphics | 60% |
| Sound | N/A |
| Value for money | 68% |

# KEY CODES

These are the ASCII codes returned by the keyboard keys in normal, and with SHIFT, CONTROL and ALT keys depressed. The Codes are given in HEX and Decimal in brackets.

| Key | Normal | Shift | Control | ALT |
|---|---|---|---|---|
| 0 | 30 ( 48) | 5F ( 95) | 1F ( 31) | 9F (159) |
| 1 | 31 ( 49) | 21 ( 33) | 31 ( 49) | 31 ( 49) |
| 2 | 32 ( 50) | 22 ( 34) | 32 ( 50) | 32 ( 50) |
| 3 | 33 ( 51) | 23 ( 35) | 33 ( 51) | 33 ( 51) |
| 4 | 34 ( 52) | 24 ( 36) | 34 ( 52) | 34 ( 52) |
| 5 | 35 ( 53) | 25 ( 37) | 35 ( 53) | 35 ( 53) |
| 6 | 36 ( 54) | 26 ( 38) | 36 ( 54) | 36 ( 54) |
| 7 | 37 ( 55) | 27 ( 39) | 37 ( 55) | 37 ( 55) |
| 8 | 38 ( 56) | 28 ( 40) | 38 ( 56) | 38 ( 56) |
| 9 | 39 ( 57) | 29 ( 41) | 39 ( 57) | 39 ( 57) |
| - | 2D ( 45) | 3D ( 61) | 2D ( 45) | 2D ( 45) |
| ^ | 5E ( 94) | 7E (126) | 1E ( 30) | 9E (158) |
| @ | 40 ( 64) | 60 ( 96) | 00 ( 0) | 80 (128) |
| [ | 5B ( 91) | 7B (123) | 1B ( 27) | 9B (155) |
| ; | 3B ( 59) | 2B ( 43) | 3B ( 59) | 3B ( 59) |
| : | 3A ( 58) | 2A ( 42) | 3A ( 58) | 3A ( 58) |
| ] | 5D ( 93) | 7D (125) | 1D ( 29) | 9D (157) |
| \ | 5C ( 92) | 7C (124) | 1C ( 28) | 9C (156) |
| , | 2C ( 44) | 3C ( 60) | 2C ( 44) | 2C ( 44) |
| . | 2E ( 46) | 3E ( 62) | 2E ( 46) | 2E ( 46) |
| / | 2F ( 47) | 3F ( 63) | 2F ( 47) | 2F ( 47) |
| SPC | 20 ( 32) | 20 ( 32) | 20 ( 32) | 20 ( 32) |

| Key | Normal | Shift | Control | ALT |
|---|---|---|---|---|
| A | 61 ( 97) | 41 ( 65) | 01 ( 1) | 81 (129) |
| B | 62 ( 98) | 42 ( 66) | 02 ( 2) | 82 (130) |
| C | 63 ( 99) | 43 ( 67) | 03 ( 3) | 83 (131) |
| D | 64 (100) | 44 ( 68) | 04 ( 4) | 84 (132) |
| E | 65 (101) | 45 ( 69) | 05 ( 5) | 85 (133) |
| F | 66 (102) | 46 ( 70) | 06 ( 6) | 86 (134) |
| G | 67 (103) | 47 ( 71) | 07 ( 7) | 87 (135) |
| H | 68 (104) | 48 ( 72) | 08 ( 8) | 88 (136) |
| I | 69 (105) | 49 ( 73) | 09 ( 9) | 89 (137) |
| J | 6A (106) | 4A ( 74) | 0A ( 10) | 8A (138) |
| K | 6B (107) | 4B ( 75) | 0B ( 11) | 8B (139) |
| L | 6C (108) | 4C ( 76) | 0C ( 12) | 8C (140) |
| M | 6D (109) | 4D ( 77) | 0D ( 13) | 8D (141) |
| N | 6E (110) | 4E ( 78) | 0E ( 14) | 8E (142) |
| O | 6F (111) | 4F ( 79) | 0F ( 15) | 8F (143) |
| P | 70 (112) | 50 ( 80) | 10 ( 16) | 90 (144) |
| Q | 71 (113) | 51 ( 81) | 11 ( 17) | 91 (145) |
| R | 72 (114) | 52 ( 82) | 12 ( 18) | 92 (146) |
| S | 73 (115) | 53 ( 83) | 13 ( 19) | 93 (147) |
| T | 74 (116) | 54 ( 84) | 14 ( 20) | 94 (148) |
| U | 75 (117) | 55 ( 85) | 15 ( 21) | 95 (149) |
| V | 76 (118) | 56 ( 86) | 16 ( 22) | 96 (150) |
| W | 77 (119) | 57 ( 87) | 17 ( 23) | 97 (151) |
| X | 78 (120) | 58 ( 88) | 18 ( 24) | 98 (152) |
| Y | 79 (121) | 59 ( 89) | 19 ( 25) | 99 (153) |
| Z | 7A (122) | 5A ( 90) | 1A ( 26) | 9A (154) |

| Key | Normal | Shift | Control | ALT |
|---|---|---|---|---|
| ENTER | 0D ( 13) | 0D ( 13) | 0D ( 13) | 0D ( 13) |
| ESC | 1B ( 27) | 1B ( 27) | 1B ( 27) | 1B ( 27) |
| TAB | 09 ( 9) | 09 ( 9) | 09 ( 9) | 09 ( 9) |
| DEL | A0 (160) | A1 (161) | A2 (162) | A3 (163) |
| ERASE | A4 (164) | A5 (165) | A6 (166) | A7 (167) |
| INS | A8 (168) | A9 (169) | AA (170) | AB (171) |
| STOP | 03 ( 3) | 03 ( 3) | 03 ( 3) | 03 ( 3) |
| JOY UP | B0 (176) | B1 (177) | B2 (178) | B3 (179) |
| JOY DOWN | B4 (180) | B5 (181) | B6 (182) | B7 (183) |
| JOY LEFT | B8 (184) | B9 (185) | BA (186) | BB (187) |
| JOY RIGHT | BC (188) | BD (189) | BE (190) | BF (191) |
| FUNCTION 1 | - | - | F0 (240) | F8 (248) |
| FUNCTION 2 | - | - | F1 (241) | F9 (249) |
| FUNCTION 3 | - | - | F2 (242) | FA (250) |
| FUNCTION 4 | - | - | F3 (243) | FB (251) |
| FUNCTION 5 | - | - | F4 (244) | FC (252) |
| FUNCTION 6 | - | - | F5 (245) | FD (253) |
| FUNCTION 7 | - | - | F6 (246) | FE (254) |
| FUNCTION 8 | - | - | F7 (247) | FF (255) |

EXOS variables involved with the keyboard driver:

6 - Keyboard Lock Status

0 = No Lock
1 = CAPS Lock
2 = SHIFT Lock
8 = ALT Lock

7 - Key Click
Default ON (0)

10 - Key Repeat Rate
Default 3

11 - Key Repeat Delay
Default 30

To set a variable from basic use:

SET variable, value

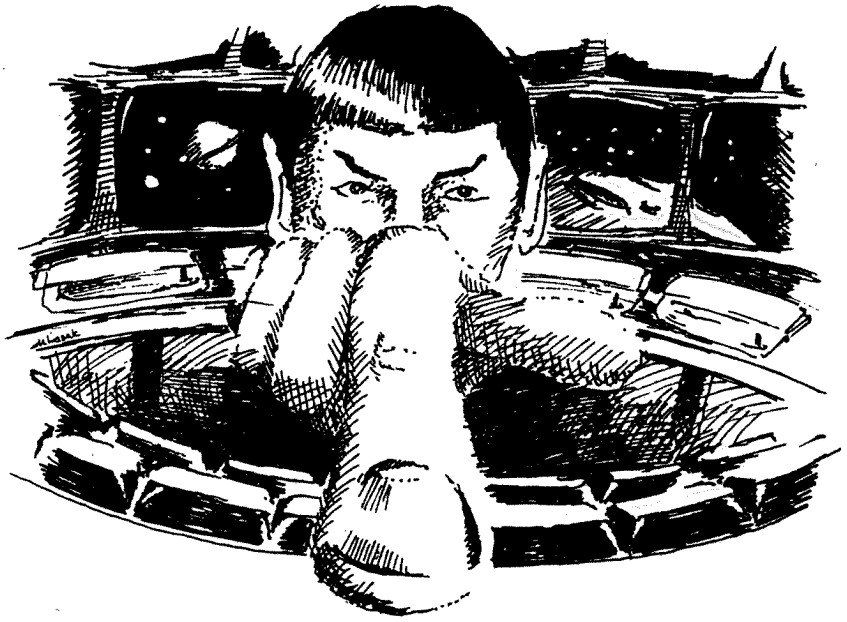
or TOGGLE variable

Where 'variable is the EXOS variable number and 'value' is the new value.

**Gary Thomson**

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 32 | 20 | @ | 64 | 40 | ' | 96 | 60 | Ç | 128 | 80 | (ALT @) |
| ! | 33 | 21 | A | 65 | 41 | a | 97 | 61 | ü | 129 | 81 | (ALT A) |
| " | 34 | 22 | B | 66 | 42 | b | 98 | 62 | é | 130 | 82 | (ALT B) |
| £ | 35 | 23 | C | 67 | 43 | c | 99 | 63 | â | 131 | 83 | (ALT C) |
| $ | 36 | 24 | D | 68 | 44 | d | 100 | 64 | ä | 132 | 84 | (ALT D) |
| % | 37 | 25 | E | 69 | 45 | e | 101 | 65 | à | 133 | 85 | (ALT E) |
| & | 38 | 26 | F | 70 | 46 | f | 102 | 66 | å | 134 | 86 | (ALT F) |
| ' | 39 | 27 | G | 71 | 47 | g | 103 | 67 | ç | 135 | 87 | (ALT G) |
| ( | 40 | 28 | H | 72 | 48 | h | 104 | 68 | ê | 136 | 88 | (ALT H) |
| ) | 41 | 29 | I | 73 | 49 | i | 105 | 69 | ë | 137 | 89 | (ALT I) |
| * | 42 | 2A | J | 74 | 4A | j | 106 | 6A | è | 138 | 8A | (ALT J) |
| + | 43 | 2B | K | 75 | 4B | k | 107 | 6B | ï | 139 | 8B | (ALT K) |
| , | 44 | 2C | L | 76 | 4C | l | 108 | 6C | î | 140 | 8C | (ALT L) |
| - | 45 | 2D | M | 77 | 4D | m | 109 | 6D | ì | 141 | 8D | (ALT M) |
| . | 46 | 2E | N | 78 | 4E | n | 110 | 6E | Ä | 142 | 8E | (ALT N) |
| / | 47 | 2F | O | 79 | 4F | o | 111 | 6F | Å | 143 | 8F | (ALT O) |
| 0 | 48 | 30 | P | 80 | 50 | p | 112 | 70 | É | 144 | 90 | (ALT P) |
| 1 | 49 | 31 | Q | 81 | 51 | q | 113 | 71 | æ | 145 | 91 | (ALT Q) |
| 2 | 50 | 32 | R | 82 | 52 | r | 114 | 72 | Æ | 146 | 92 | (ALT R) |
| 3 | 51 | 33 | S | 83 | 53 | s | 115 | 73 | ô | 147 | 93 | (ALT S) |
| 4 | 52 | 34 | T | 84 | 54 | t | 116 | 74 | ö | 148 | 94 | (ALT T) |
| 5 | 53 | 35 | U | 85 | 55 | u | 117 | 75 | ò | 149 | 95 | (ALT U) |
| 6 | 54 | 36 | V | 86 | 56 | v | 118 | 76 | û | 150 | 96 | (ALT V) |
| 7 | 55 | 37 | W | 87 | 57 | w | 119 | 77 | ù | 151 | 97 | (ALT W) |
| 8 | 56 | 38 | X | 88 | 58 | x | 120 | 78 | ÿ | 152 | 98 | (ALT X) |
| 9 | 57 | 39 | Y | 89 | 59 | y | 121 | 79 | Ö | 153 | 99 | (ALT Y) |
| : | 58 | 3A | Z | 90 | 5A | z | 122 | 7A | Ü | 154 | 9A | (ALT Z) |
| ; | 59 | 3B | [ | 91 | 5B | { | 123 | 7B | ¢ | 155 | 9B | (ALT [) |
| < | 60 | 3C | \ | 92 | 5C | \| | 124 | 7C | £ | 156 | 9C | (ALT \) |
| = | 61 | 3D | ] | 93 | 5D | } | 125 | 7D | ¥ | 157 | 9D | (ALT ]) |
| > | 62 | 3E | ^ | 94 | 5E | ~ | 126 | 7E | ₧ | 158 | 9E | (ALT ^) |
| ? | 63 | 3F | _ | 95 | 5F | ⌂ | 127 | 7F | ƒ | 159 | 9F | (ALT _) |

# Programming



## System variables

If anyone turns to page 187 in the Enterprise manual, they will see halfway down the page in big, bold letters the word VARIABLE. Next to this they will be told that "specified operating system variables" may be set, toggled or asked. All very interesting you may say, and probably quite useful !

Then you come to the dreaded disclaimer- "For further details see the Enterprise Technical Manual", only one problem there - very few people have seen this tome, or are likely to now that Enterprise have gone into receivership.

Never fear, your intrepid team has gone boldly where no man has gone before and proudly present:-

SYSTEM VARIABLES

System variables are just what they sound like, variables that the computer uses to set various machine options. Most perform the same tasks as the functions provided in the machine options section of the Basic manual, and so are only of real use to the machine code programmer by using EXOS function 16. This brings us to another taboo area, that of EXOS function calls.

The programming manual is a little short on explanations when it comes to EXOS, indeed there are only three pages devoted to it. Within this mine of information there is a list of functions which can be called by the user to perform various tasks, such as reading a character from a channel, or setting the internal clock. However there is very little information on what each function does, and even less on how to use them. We will be dealing with EXOS functions in a later issue, but for now I will give enough information that system variables may be used from machine code.

Before making the call to Exos registers B,C and D must be set as follows:

B= 0 to read (as per Basic ASK)
1 to write (as per SET)
2 to toggle (guess what, as per TOGGLE !)

C= Exos variable number that you want to do something to.

D= value to be written to variable, only valid if B=1

Once you've set these variables you have to call function 16; see page 201 in the Basic manual for a full list of functions. This done by using a RST 30h followed by 16, so in assembler we might have something like:

```
LD B,3
LD C,7
RST 48
DEFB 16
```

This would toggle the key click. The function will set registers A and D. To deal with them in reverse order, D will hold the new value of the variable. A contains what is known as the status code, this will be zero if everything went well but will be non-zero if something went wrong; in this case for instance you may be trying to effect a variable that doesn't exist. Now comes a clever bit, if you do a RST 18h after the function call Exos will check the value of A and return an error message if A is not zero - who said machine code programs crashed irrecoverably ?

---

On with the variables.

0 This variable allows control of which interupts are enabled. One must think in binary when setting the value, or else use the BIN function. Interrupts effected are:

| | |
|---|---|
| Sound interrupt | bit 0 |
| 1Hz interrupt | bit 2 |
| Video interrupt | bit 4 |
| External interrupt | bit 6 |

Each bit must be set to 1 to enable the interrupt.

The 1Hz interrupt is used by the internal clock and timer, it is normally enabled. If disabled then the

timer and real time clock won't work.

The video interrupt occurs every 1/50th of a second, (at the video flyback). Again this is normally enabled. This interrupt is used to read the keyboard, thus it is important to re-enable it at the end of any program where it has been dissabled.

The external interrupt is, I believe, used by the network; however I haven't been able to test this and would welcome any more enlightened comments.

I have been unable to find any use for enabling the sound interrupt, it slow programs down so it must be doing something. Again I'd welcome any comments on it's use.

Only bits 0,2,4 and 6 have any effect, (bits 1,3,5 and 7 should be set to 0).

Example: To enable the video interrupt whilst disabling everything else:-

SET 0,BIN(00010000) or SET 0,16

This variable can only be SET, the ask option cannot be used.

1 This variable is set by the machine to cause a software interrupt. It can be set by the user to cause a software interrupt, similar to pressing the stop key.

2 Returns the code of the last software interrupt and works in the same way as ASK INTERRUPT CODE. The code returned will depend on what caused the interrupt. Known values are:-

16 Function key 1 pressed when null string was programmed to it,
i.e. SET FKEY 1 "" .

17 - 31 As above for function keys 2 to 16

32 Stop key pressed. Only works if stop key enabled

33 Any key pressed. Only works if key press interrupt set. See '9' below.

64 Timer reached 0.

3 Sets default memory medium.

0 = non file handling device, such as tape.
1 = file handling device, such as disc.

4 The default channel number, used by external commands such as HELP. This channel will be used whenever a call is made to channel 255.

5. A countdown timer, set in seconds. Causes an interrupt when it reaches zero, see 2 above. This will only work if the 1Hz inerupt is enabled.

6 Defines the keyboard lock status.
0=normal.
1=CAPS lock.
2=SHIFT lock.
8=ALT lock.
(One of the wierder numbering systems, that !)

7 Set to 255 to disable key click,0 to enable key click.

8 If this variable is set to 0, its default, the stop key will operate normally. If set to 255 the stop key will not cause an interrupt but return the ASCII value 03.

9 If set to 0 any keypress will cause a software interrupt, setting 2 above, as well as returning the ASSCI code for the key.

10 Keyboard repeat rate, given in 1/50 seconds.

11 Delay until key repeat in 1/50 seconds. 0 disables auto-repeat.

12 0 enables tape sound.
255 disables tape sound.

13 If set to 0 the sound driver will wait when the sound queue becomes full. If set to 255 the error 'Sound queue full' will be generated.

14 0 enables the internal speaker.
255 disables the internal speaker.

15 Size of sound buffer in phases, this determines the maximum length of each envelope.

16 Sets baud rate of the serial interface as follows:-

0= 50 baud
1= 75 "
2= 110 "
3= 134.5 "
4= 150 "
5= 200 "
6= 300 "
7= 600 "
8= 1200 "
9= 1800 "
10= 2400 "
11= 3600 "
12= 4800 "
13= 7200 "
14= 9600 "
15= 9600 "

17 Sets the word format used by the serial interface, this is another one you have to think in binary for.

| Bit | Value | Effect |
|---|---|---|
| 0 | 0 | 8 data bits |
| | 1 | 7 data bits |
| 1 | 0 | no parity check |
| | 1 | parity check made |
| 2 | 0 | even parity check |
| | 1 | odd parity check (this bit is ignored if bit 1=0) |
| 3 | 0 | 2 stop bits |

1 1 stop bit

---

Bits 4 to 7 are not used and must be set to zero.

18 The network number used by the computer.

19 If set to 0 a sofware interrupt is caused if data is received via the net.

20 The channel number on which net data is waiting.

21 The network number of the machine that has transmitted data.

22 Sets the video mode of subsequently opened video pages. The values are the same as for the video option VIDEO MODE.

23 Sets the colour mode for video pages. The same as VIDEO COLOUR.

24 Sets the horizontal page size for video pages.

25 Sets the vertical page size for video pages.

26 0 causes status line to be displayed. 255 turns the line off. 42 shows that even developers have an ego.

27 Sets the border colour.

28 Sets the bias for palette colours 8 to 15.

29 Sets the default video channel for subsequently opened editor channels.

30 Sets the default keyboard channel for subsequently opened editors.

31 Sets the size of the editor buffer, in 1/4K blocks. Defaults to 8, i.e. 2k.

32 Flag controling how the editor is read. This is very complicated, and not of much use to the average user. Whats more it would take tons of space to explain it, even if I did understand it. (If there's enough demand we'll explain this variable in detail in a later issue).

33 Set to 255 to cause slow tape saving. Set to 0 for normal speed.

34 This flag allows tapes to be protected from simple copying. If set to 255 then there will be no tape protection. If set to 0 before a program is saved it will set a flag in the program header. This flag will stop two tape channels being opened at the same time, thus stopping through the machine copying.

35 Sets tape output level:-

0 or 1= 20 mV
2= 40 mV
3= 80 mV
4= 170 mV
5= 350 mV
6 - 255= 700 mV

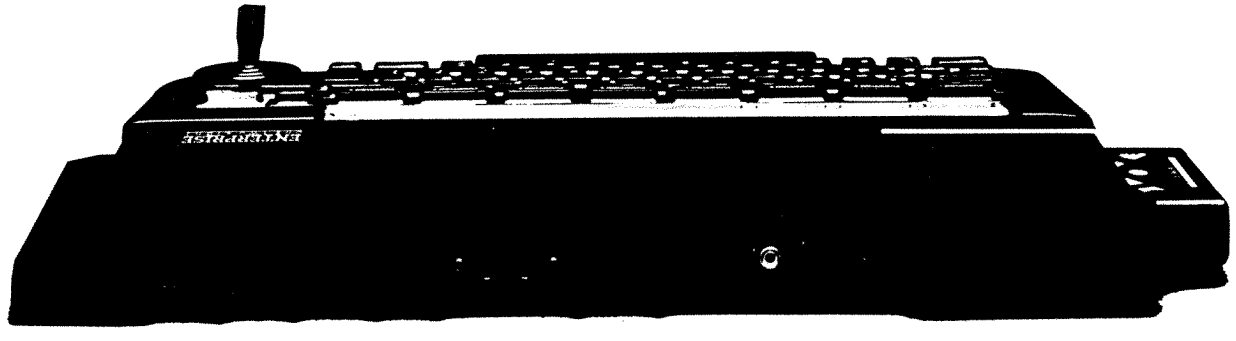
36 Set to 255 to switch remote 1 off. Set to 0 to switch it on.

37 As above but for remote 2.

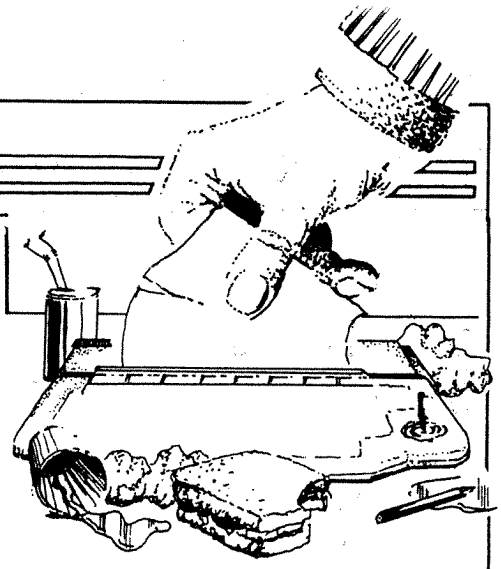
39 Interrupt counter, increments with each interrupt, if the video interrupt is the only one that is enabled this provides a 1/50 second timer. Of course its only useful for events less than 256/50 seconds long, i.e. roughly 5 seconds.

38 ?

**Dave Race**



# Home Produce



If you want to program in machine-code, but do not belong to a major software company, then you are usually short on information. The only way to find out about the machine is to disassemble. In the case of the Enterprise, there is a lot to find out.

To use the disassmebler, just run it and wait. It takes time to set up the arrays. When it has finished, it will ask:

Input segment, address:

The segment is a memory page from 0 to 255. The address is the address in that page. This will be brought down to a number between 0 and 16383, the offset into that segment. It will then ask:

Characters, All, Mnemonics ?

By pressing 'c', you will get a list of printable characters from that address onwards. By pressing 'a', you will get a list of addresses, 8-bit decimal numbers, 16-bit decimal numbers, hex codes and characters. Pressing 'm' will disassemble into assembler mnemonics. All numbers are in decimal. Relative jumps point to the address, not offset. Pressing 'ESC' will bring you back to the address prompt at any time while disassembling.

Look through the information given about BASIC and EXOS for suitable addresses.

An example:-

Input segment ,address: 4,22
Characters, All, Mnemonics ? A

will print out the BCD times tables!

Andrew Richards

```
100 DATA b,c,d,e,h,l,(hl),a
  110 DATA bc,de,hl,sp
  120 DATA rlca,nop,rrca,ex  af.af',rla,djnz ,rra,jr
 ,daa,jr  nz.,cpl,jr  z.,scf,jr  nc.,ccf,jr  c.
  130 DATA add ,adc ,sub ,sbc ,and,xor ,or  ,cp
  140 DATA nz,z,nc,c,po,pe,p,m
  150 DATA jp  ,CB,out (,in  (,ex  (sp).hl,ex
hl.de,di,ei
  160 DATA rlc  ,rrc  ,rl  ,rr  ,sla  ,sra  ,sll  ,
srl  ,bit 0.,bit 1.,bit 2.,bit 3.,bit 4.,bit 5.,
bit 6.,bit 7.
  170 DATA res 0., res 1., res 2., res 3., res
4., res 5., res 6., res 7
  180 DATA set 0., set 1., set 2., set 3.,set 4.,
set 5.,set 6.,set 7.
  190 STRING REG8$(7)*4
  200 STRING REG16$(3)*2
  210 STRING F$(255)*15
  220 STRING S$(255)*7
  230 STRING COND$(7)*3
  240 STRING CB$(32)
  250 NUMERIC L(255)
  260 FOR N=0 TO 255 STEP 8
  270   LET L(N)=1
  280   LET S$(N),S$(N+1),S$(N+2),S$(N+3),S$(N+4),S$(
N+5),S$(N+6),S$(N+7)=""
  290   LET L(N+1),L(N+2),L(N+3),L(N+4),L(N+5),L(N+6),
L(N+7)=1
  300 NEXT
  310 LET F$(221)="DD"
  320 LET F$(237)="ED"
  330 LET F$(253)="FD"
  340 FOR X=0 TO 7
  350   READ REG8$(X)
  360 NEXT
  370 FOR X=0 TO 7
  380   FOR Y=0 TO 7
  390     LET F$(X*8+Y+64)="ld  "+REG8$(X)+","+REG8$(Y)
  400   NEXT
  410 NEXT
  420 FOR N=0 TO 3
  430   READ REG16$(N)
  440 NEXT
  450 FOR N=0 TO 63 STEP 8
  460   LET X$=REG8$(N/8)
  470   READ F$(N+7)
  480   READ F$(N)
  490   LET F$(N+4)="inc  "+X$
  500   LET F$(N+5)="dec  "+X$
  510   LET F$(N+6)="ld  "+X$+",":LET L(N+6)=2
  520 NEXT
  530 FOR N=1 TO 63 STEP 16
  540   LET X$=REG16$(N/16)
  550   LET F$(N)="ld  "+X$+","
  560   LET L(N)=3
  570   LET F$(N+1)="ld  ("+X$+"),a"
  580   LET F$(N+2)="inc  "+X$:LET L(N+2)=1
  590   LET F$(N+8)="add  hl,"+X$
  600   LET F$(N+9)="ld  a,("+X$+")"
  610   LET F$(N+10)="dec  "+X$
  620   LET X$=REG8$(N/8)
  630 NEXT
  640 FOR X=0 TO 7
  650   READ X$
  660   LET F$(X*8+198)=X$+" ":LET L(X*8+198)=2
```

# Home Produce

By Andrew Richards

```
670   FOR Y=0 TO 7
680     LET F$(X*8+Y+128)=X$&' '&REG8$(Y)
690   NEXT
700 NEXT
710 FOR N=0 TO 7
720   READ COND$(N)
730   LET F$(199+N*8)='rst  '&STR$(N*8)
740   LET X$=COND$(N)
750   LET X=N*8+192
760   LET F$(X)='ret  '&X$
770   LET F$(X+2)='jp   '&X$&','
780   LET F$(X+4)='call '&X$&','
790   LET L(X+2)=3
800   LET L(X+4)=3
810 NEXT
820 LET REG16$(3)='af'
830 FOR N=0 TO 3
840   LET X=N*16+192
850   LET F$(X+1)='pop  '&REG16$(N)
860   LET F$(X+5)='push '&REG16$(N)
870 NEXT
880 FOR N=195 TO 255 STEP 8
890   READ F$(N)
900 NEXT
910 FOR N=0 TO 31
920   READ CB$(N)
930 NEXT
940 LET F$(249)='ld   sp,hl'
950 LET F$(205)='call ':LET L(205)=3
960 LET F$(201)='ret'
970 LET F$(217)='exx'
980 LET F$(233)='jp   (hl)'
990 LET F$(34)='ld   (':LET S$(34)='),hl':LET L(34)=
3
1000 LET F$(42)='ld   hl,(':LET S$(42)=')':LET L(42)=
3
1010 LET F$(50)='ld   (':LET S$(50)='),a':LET L(50)=3
1020 LET S$(211),S$(219)='),a':LET L(211),L(219)=2
1030 LET F$(58)='ld   a,(':LET S$(58)=')':LET L(58)=3
1040 LET F$(34)='ld   (':LET S$(34)='),hl':LET L(34)=
3
1050 LET F$(42)='ld   hl,(':LET S$(42)=')':LET L(42)=
3
1060 LET F$(247)='rst  48:':LET L(247)=2
1070 LET L(195)=3
1080 FOR N=16 TO 63 STEP 8
1090   LET L(N)=4
1100 NEXT
1110 TEXT
1120 DO
1130   SET £1002:PALETTE RGB(.7,.7,0)
1140   INPUT PROMPT 'Input segment,address: ':S,A
1150   LET A=MOD(A,16384)
1160   PRINT 'Characters/All/Mnemonics?'
1170   DO
1180     LET K$=INKEY$
1190   LOOP UNTIL K$='c' OR K$='a' OR K$='m'
1200   IF K$='a' THEN
1210     FOR N=A TO 16384
1220       LET X=SPEEK(S,N)
1230       PRINT N,X,X+256*SPEEK(S,N+1),;
1232       PRINT '$123456789ABCDEF'(X/16+1:X/16+1);
1240       PRINT '$123456789ABCDEF'(MOD(X,16)+1:MOD(
X,16)+1),
1250       IF X>31 AND X<159 THEN PRINT CHR$(X);
1260       IF INKEY$=CHR$(27) THEN EXIT FOR
1270       PRINT
1280     NEXT
1290     PRINT
1300   ELSE IF K$='c' THEN
1310     FOR N=A TO 16384
1320       LET X=SPEEK(S,N)
1330       IF X>31 AND X<159 THEN PRINT CHR$(X);
1340       IF INKEY$=CHR$(27) THEN EXIT FOR
1350     NEXT
1360     PRINT :PRINT 'ESCape at address';N
1370   ELSE
1380     DO WHILE A<16384 AND INKEY$<>CHR$(27)
1390       LET N=SPEEK(S,A)
1400       IF F$(N)='FD' OR F$(N)='DD' THEN
1410         CALL INDEX
1420       ELSE IF N=203 THEN
1430         PRINT A,CB$(SPEEK(S,A+1)/8);REG8$(MOD(
SPEEK(S,A+1),8))
1440         LET A=A+1
1450       ELSE IF N=237 THEN
1460         CALL ED
1470       ELSE
1480         PRINT A,F$(N);
1490         IF L(N)=3 THEN
1500           PRINT STR$(SPEEK(S,A+1)+256*SPEEK(S,A+
2));S$(N);
1510           LET A=A+2
1520         ELSE IF L(N)=2 THEN
1530           PRINT STR$(SPEEK(S,A+1));S$(N);
1540           LET A=A+1
1550         ELSE IF L(N)=4 THEN
1560           PRINT STR$(SPEEK(S,A+1)+256*(SPEEK(S,
A+1)>128)+A+2);:LET A=A+1
1570         END IF
1580         PRINT
1590       END IF
1600       LET A=A+1
1610     LOOP
1620   END IF
1630 LOOP
1640 DEF LIST
1650   TEXT 80
1660   SET £1002:PALETTE GREEN,BLACK,GREEN,RED
1670   FOR N=0 TO 255 STEP 16
1680     FOR X=N TO N+15
1690       PRINT F$(X);";";
1700     NEXT
1710     PRINT
1720   NEXT
1730   STOP
```

```
1740 END DEF
1750 DEF INDEX
1760   IF F$(N)="FD" THEN
1770     LET I$="iy"
1780   ELSE
1790     LET I$="ix"
1800   END IF
1810   LET X$=F$(SPEEK(S,A+1))
1820   IF L(SPEEK(S,A+1))=3 THEN LET X$=X$&STR$(
SPEEK(S,A+2)+256*SPEEK(S,A+3))&S$(SPEEK(S,A+1)):LET A=
A+2
1830   LET X=POS(X$&" ","(hl)")
1840   PRINT A,
1850   IF X$="CB" THEN
1860     LET A=A+2
1870     PRINT CB$(SPEEK(S,A+1)/8);"(";I$;"+";REL$(
SPEEK(S,A));")";
1880   ELSE
1890     IF X<>0 THEN
1900       PRINT X$(:X-1) "(" I$ "+" REL$(SPEEK(S,A+
2)) ")";X$(X+4:);
1910       LET A=A+1
1920       IF L(SPEEK(S,A))=2 THEN
1930         PRINT STR$(SPEEK(S,A+2));S$(SPEEK(S,A));
1940         LET A=A+1
1950       END IF
1960     ELSE
1970       PRINT X$(1:POS(X$&" ","hl")-1);I$;X$(POS(
X$&" ","hl")+2:);
1980     END IF
1990   END IF
2000   LET A=A+1
2010   PRINT
2020 END DEF
2030 DEF ED
2040   LET REG16$(3)="sp"
2050   PRINT A,
2060   LET N=SPEEK(S,A+1) BOR 64:LET A=A+1
2070   IF N>=160 THEN
2080     SELECT CASE N
2090     CASE 160,176,168,184
2100       PRINT "ld";
2110     CASE 161,177,169,185
2120       PRINT "cp";
2130     CASE 162,178,170,186
2140       PRINT "in";
2150     CASE 163,179,171,187
2160       PRINT "out";
2170     END SELECT
2180     IF MOD(N,16)<8 THEN
2190       PRINT "i";
2200     ELSE
2210       PRINT "d";
2220     END IF
2230     IF N>175 THEN PRINT "r";
2240     PRINT
2250   ELSE
2260     LET N8=MOD(N,8):LET N16=MOD(N,16)
2270     LET N=N-64
2280     SELECT CASE N8
2290     CASE 0
2300       PRINT "in   ";REG8$(N/8);",(c)"
2310     CASE 1
2320       PRINT "out  (c),";REG8$(N/8)
2330     CASE ELSE
2340       SELECT CASE N16
2350       CASE 2
2360         PRINT "sbc  hl,";REG16$(N/16)
2370       CASE 3
2380         PRINT "ld   (";STR$(SPEEK(S,A+1)+256*
SPEEK(S,A+2));"),";REG16$(N/16)
2390         LET A=A+2
2400       CASE 10
2410         PRINT "adc  hl,";REG16$(N/16)
2420       CASE 11
2430         PRINT "ld   ";REG16$(N/16);",(";STR$(
SPEEK(S,A+1)+256*SPEEK(S,A+2));")"
2440         LET A=A+2
2450       CASE ELSE
2460         LET N=N+64
2470         IF N=68 THEN
2480           PRINT "neg"
2490         ELSE IF N=84 THEN
2500           PRINT "retn"
2510         ELSE IF N=80 THEN
2520           PRINT "reti"
2530         ELSE IF N=70 THEN
2540           PRINT "im   0"
2550         ELSE IF N=86 THEN
2560           PRINT "im   1"
2570         ELSE IF N=78 THEN
2580           PRINT "im   2"
2590         ELSE IF N=71 THEN
2600           PRINT "ld   i,a"
2610         ELSE IF N=87 THEN
2620           PRINT "ld   a,i"
2630         ELSE IF N=79 THEN
2640           PRINT "ld   r,a"
2650         ELSE IF N=95 THEN
2660           PRINT "ld   a,r"
2670         END IF
2680       END SELECT
2690     END SELECT
2700   END IF
2710 END DEF
2720 DEF REL$(XX)
2730   IF XX>127 THEN LET XX=XX-256
2740   LET REL$=STR$(XX)
2750 END DEF
```

# OUTSIDE CONNECTIONS

# Enterprise Expansion Port

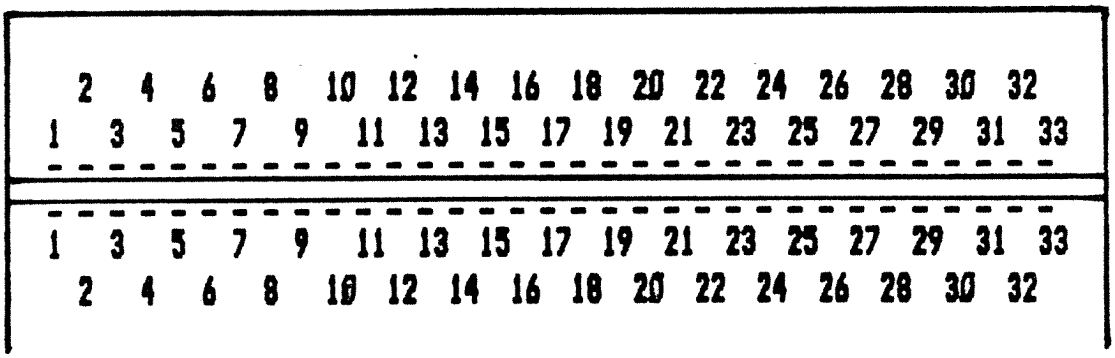
As promised in issue 5 here are the pinouts for the 64 way Expansion connector.

The Enterprise has p.c.b finger edge connectors at standard 2.54mm pitch

Here is a veiw of the expansion connector looking into it from the side. The top is side B and the bottom is side A. The numbering starts from left to right as per diagram

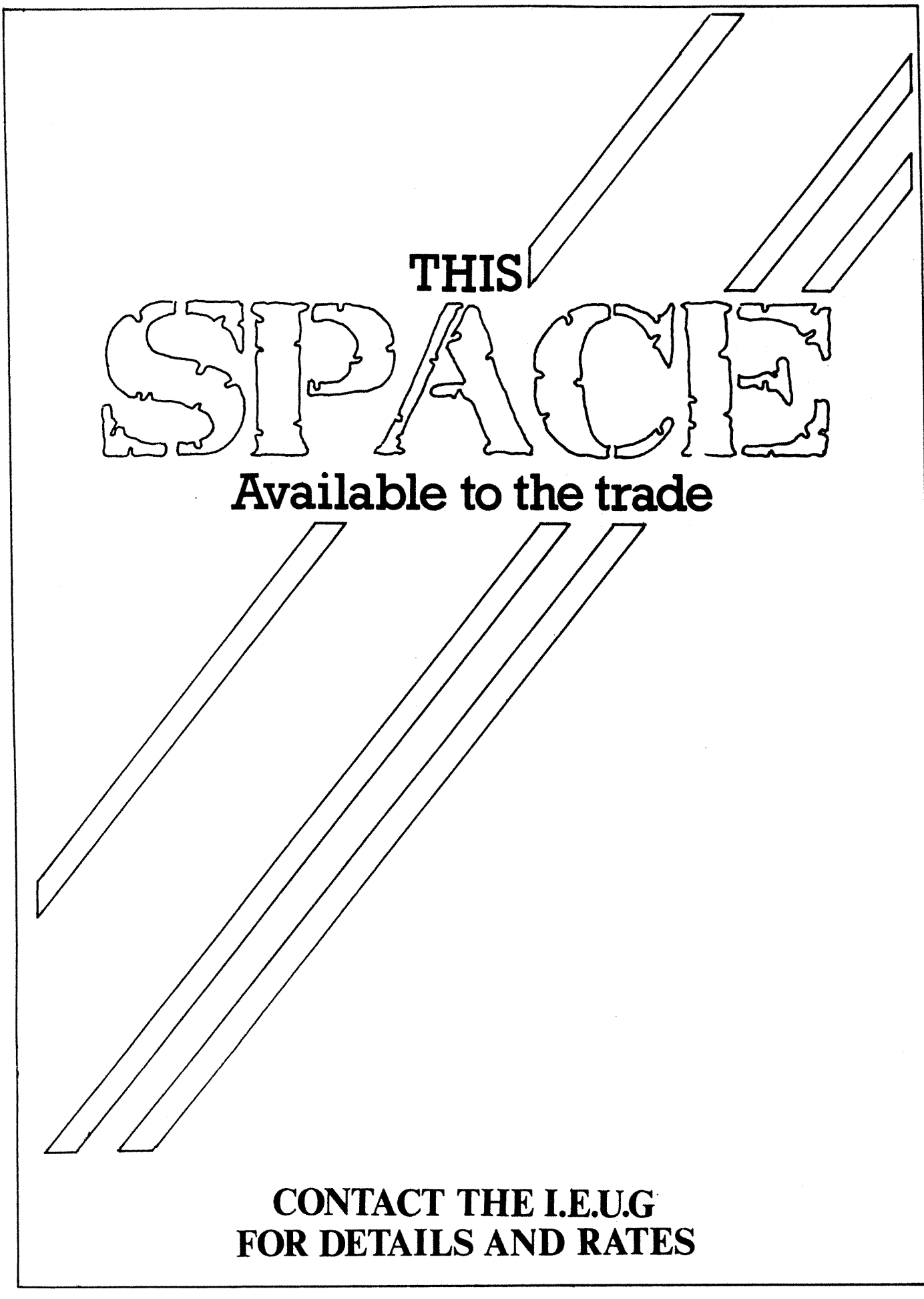
Tim Box

SIDE B




SIDE A

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| B1 | LH AUDIO | A1 | RH AUDIO | B17 | D7 | A17 | D6 |
| B2 | /WR | A2 | /RFRH | B18 | /INT | A18 | /RESET |
| B3 | /IORQ | A3 | /RD | B19 | GND | A19 | /WAIT |
| B4 | ----- | A4 | ----- | B20 | GND | A20 | /M1 |
| B5 | /NMI | A5 | /MREQ | B21 | GND | A21 | /1MHZ |
| B6 | A9 | A6 | A8 | B22 | GND | A22 | /CK |
| B7 | A11 | A7 | A10 | B23 | GND | A23 | 8MHZ |
| B8 | A13 | A8 | A12 | B24 | EC1 | A24 | EC0 |
| B9 | A15 | A9 | A14 | B25 | EC3 | A25 | EC2 |
| B10 | A1 | A10 | A0 | B26 | A16 | A26 | /EXTC |
| B11 | A3 | A11 | A2 | B27 | A18 | A27 | A17 |
| B12 | A5 | A12 | A4 | B28 | A20 | A28 | A19 |
| B13 | A7 | A13 | A6 | B29 | 14MHZ | A29 | A21 |
| B14 | D1 | A14 | D0 | B30 | /VSYNC | A30 | GND |
| B15 | D3 | A15 | D2 | B31 | ----- | A31 | GND |
| B16 | D5 | A16 | D4 | B32 | GND | A32 | /HSYNC |
| | | | | B33 | +9V | A33 | +9V |

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A quick reference guide to issues 1-6

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