

NATGUG

NEWS

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OFFICIAL JOURNAL OF THE

National TRS-80

& Genie Users

Group.

INFORMATION ON THE GROUP

Membership of the group is by subscription to the Newsletter, which is published monthly. Membership details are obtainable from the Group Secretary. Membership of the group is open to anyone with an interest in computers but special emphasis is placed on equipment in the TANDY range.

Details of the Group accounts, and the constitution of the Group, are available from the Secretary.

Members requiring assistance with problems related to the TRS-80 / Video Genie may call the Secretary. An attempt will be made to put them in touch with a member who can help with the problem.

Workshops are arranged from time to time in various parts of the country.

Sub-groups exist in many areas. A list is provided in the Newsletter from time to time.

The Group maintains two software libraries (Models I and II) which are free to members. Library lists are available from the Secretary.

For confidentiality reasons, the membership list is not generally available, but members may ask the secretary for a list of members in their area, and mailshots to all members may be arranged.

Back numbers of the Newsletter are available from the Secretary.

Please send all contributions for the Newsletter to the Editor, on disk if at all possible (5.25", NEWDOS-80 v2 or Montezuma Micro CP/M preferred, any combination of density, sides or tracks, but please say what it is). Your disk will be returned.

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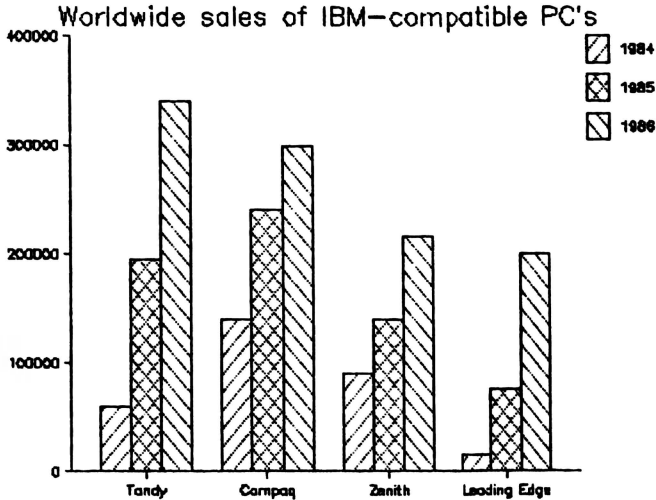
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EDITORIAL

Well I'm sitting here desperately trying to think of something to say for my last Editorial. I must thank my wife for typing in contributions that have come in manuscript form, and also for her patience, since I have devoted one complete weekend in every five to putting the Newsletter together. I must also thank all those who have sent in contributions over the past year, without them this Newsletter could not exist. Perhaps my friends will begin to phone me again now, they had just about given up since everytime they rang I badgered them for an article !

Some of you may not know but as of the 1st January, 1987, Tandy Corporation has "spun off" its international operations to form a new business, "InterTAN Inc". This comprises two main trading companies, InterTAN Canada Ltd which controls operations in the UK, France, Belgium, West Germany, The Netherlands and Canada, and InterTAN Australia. Tandy gives three primary reasons for the creation of InterTAN: Firstly, to enable management to devote more time to the expansion of US operations. Secondly, to enable it to devote more time and resources to meet its objectives of being one of the leaders (!) in the micro-computer business and thirdly to enable the restructuring of European operations to provide localised and individually tailored business plans to improve profitability.

It sounds very impressive but I'm not sure exactly what this will mean to the average Tandy Store in our high streets, except that they (TANDY UK) no longer have big Mama to bail them out if they get into financial trouble. There was a fair amount of criticism in the trade and financial papers last week (mid Feb), of Tandy UK's announcement that they were not going to try to break into the corporate sales market, they thought that they could do well enough from small business and sales to individuals. If you believe the figures from the market research company Dataquest, that Tandy are bandying around (see bar-chart overpage), then they aren't doing to badly with this type of policy. These figure are of course for world wide sales, ie mainly USA. I really can't see them doing that well over here unless they can crack the corporate market.



One of the most interesting items to be introduced in the last month is CIX. This is a British development of BIX, the Byte Information eXchange, a personal computer based conferencing system. Byte has a few choice conference abstracts under the title "Best of BIX" which will give you the flavour of the environment. It is the logical extension of the bulletin board and computer special interest groups rolled into one. The original development is quite old, but the present setup is based on software developed at the University of Guelph in Canada. The basic premise was that trying to organise a meeting where you had to get more than two people in the same room at the same time was wasteful in this computer age. They therefore developed an electronic alternative that removed the spatial and temporal constraints. This software (Cosy), together with a minicomputer, has been purchased and setup by Compulink. Already about twenty conferences have been established, and not all of the topics are directly concerned with computing, but almost all are interesting and often contain useful information. This may at last persuade me to buy a modem. Perhaps CIX will eventually replace the NEWSLETTER.

With that parting thought, it just remains for me to thank you for not being too rude about my editorials over the last 12 months, and to wish my successor good luck. - Geof, ex-Ed.

Readers Letters

Dear Editor,

Here's one member who still reads the NEWS, even if not heard from in '86. Having popped up in your pages in the last 5 years 3 times as a tape user and once as a disk user, I have fallen behind my annual contribution frequency.

One thing that cooled my ardour was the new editorial preference for disk as a medium for contributions. I applaud the way the daisy wheel printout of the newsletter has raised the floor-level of legibility. I am less happy about the way it left no floor space between floor and ceiling, squeezing out variety, contrast and originality of formatting. For me formatting has been half the challenge and fun of writing micro articles. But to get some things said that I want to say, maybe I can get by with a simple printed letter.

First I want to say how much I am indebted, on this far frontier, to the newsletter in general, to several particular contributions, and most particularly and quite independently to Trevor Hutchinson and Derek Traylor. I have acknowledged my debt to them in these pages before, but they have surpassed themselves since. I find it hard to think of comparable cases known to me outside NATGUG of people going so far beyond the call of duty in helping someone otherwise unknown to them. I have a whole volume of correspondence from Derek in which, among other things, he got me across the threshold of the BASIC programming I have needed to escape the trap of total dependence on applications programs running on obsolete systems. I can count whole days spent by Trevor getting me going with one piece of refractory hardware after another, picked up more or less for a song, and leaving me and my workmates currently running 4 systems, 8 drives, about as many applications, and sundry external devices, all tiding us over until the time is ripe for a technological quantum leap.

Speaking of NATGUG, may I ask what became of the recent reinterpretation of its initials: "Tandy, Amstrad, and General Z80 Users Group"? Speaking of quantum leaps, may I ask what became of the QL Users Group and of its newsletter, Quanta? Does the QL still have a future? (In order of asking, Changing the name did not seem to entice Amstrad owners, they all joined the CPM user group, IQLUG and Quanta still exist, and lastly I don't think the QL ever had a future given that awful keyboard and microdrives - Ed)

Could you tell us more about that prize Model 1 program of 1986 (October editorial) and of how one might get hold of it? Anything like that could be a lifebuoy keeping surviving heads above water in the Model 1 owners community. In particular, it would surely prolong my own use of the Model 1 (or dependence thereon, if you want to look at it that way) if I could find some kind of "pop-up" or "deskmate" program running on the Model 1. Molimerx knows of none. (I think I dug the snippet about the

Othello program - if that's what you refer too - out of a 80-Micro, give Microsmiths a ring for details - Ed)

I wrote to Prosoft to know if, having provided the springboard for Fontasy, they can now beef up Dotwriter to do some of the same kinds of extra "desktop publishing" things on the Models 1,3 and 4. I also asked if a beefed-up Dotwriter, having done so much for the print quality of 8-pin printers like that of the Epson MX, could do that much more with 24-pin printers like the Epson LQ (at present it doesn't do that much more). I have no answer as yet, but maybe there is an answer in NATGUG. (I don't know for sure but I'd guess the answer to both your questions will be somewhat negative. The lack of readily available Hi-Res graphics on obsolete machines doesn't strike me as suggestive of huge profits, and the resolution obtained with 8-pin dotmatrix is often just as good as with 24-pin, it's just that they do what they do rather faster with less need to make dot overlap occur with small adjustments of printhead movement. - Ed).

I have had a Model 4 for a couple of years without having yet made much use of its Model 4 features. What is the prospect for a plug-in-and-go 1-meg memory upgrade that will run with Model 1-4 programs like Powerscript, Dotwriter, Visicalc, Sir? Or for a cheaper plug-in-and-go hard disk for the same? If I am to stay much longer with TRSDOS systems, something will have to give in regard to RAM and disk storage limitations. But then maybe I just shouldn't stay much longer with TRSDOS. (See the accompanying letter and article for prospects of 1 MByte upgrades - Ed)

Parig Digan, Dalgan Park, Navan, Ireland.

Dear Ed.,

I use a Tandy 4P. Tandy have without warning withdrawn SUPERSCRIPSIT for the Model 4. I have been able to obtain a copy of the program bu need to have a look at the manual. Could any member loan or sell me a copy of the manual.

Secondly, does any member have a driver to drive Epson printers from within Superscripsit, or can anyone give advice about modifying one of the Tandy drivers

Thank you in anticipation,

Rev. R.S. Wilson. Greenside Vicarage, Ryton, Tyne and Wear
(Tel. 091413 8281)

Dear Ed.,

At the NATGUG SWINDON meeting in March of this 1987 year of The RABBIT we will demonstrate a small Z80 megabyte expansion system comprising :

- a) 1 Megabyte RAM (RAM Switched at 32 or 64 K paging)
- b) WD1002 Winchester controller interface
- c) Battery backed up real time clock
- d) Z80 CTC interrupt controller
- e) Up to 16 K BOOT ROM (optional).

The system has been designed as a small PCB (5 X 7 inches) to expand any Z80 system running up to 4 MHz. No physical circuit modification is required to the host system as connection between the two systems is established by removing the Z80 in the host machine and inserting a smaller interface PCB having 2 buffered ribbon cables. The PCBs have been manufactured professionally to our design.

We will not test all available Z80 based machines, but we nevertheless expect that the insertion of the interface board will not disturb any of the peripherals currently controlled by a Z80 host system.

Software has been developed to run the board on Tandy Model 1 "look-alikes" under an existing Operating System, namely LDOS 5.1.4. The developed software enables the use of standard Radio-Shack hard-disc driver programs. It also enables the use of a RAM Disk emulating an 80 track double sided and double density disk.

Other patches to LDOS allow the use of a real time clock comparable to that available on the LOBO.

The logic controlling the megabyte ram expansion enables software controllable replacement of all of the Model 1 ROM and unused address spaces with RAM. The switching out of memory mapped devices enables the running of a full 64 K machine. Those familiar with TRSDOS 6 may be able to see analogies with LDOS 5.1.4

The WD1002 interface allows the use of a controller card permitting the addition of up to 3 Winchesters and up to 4 floppy disk drives to the host system.

The expansion board runs on a LNW80 model 1 and is now under test on a Tandy-Model 1. None of the Tandy Model 1/111 software tested so far has been impaired when the expansion board is in use. As the expansion board interfaces at the Z80 level it should be applicable to the Genie Model 1 and Genie GNOMIC expansion, the Lobo and MAX80 and the TANDY Model 1 GNOMIC expansion. Additional software modifications are required for TANDY Models 3 and 4. A previous note by Roy Barber - cf reference below - quotes 19 patches written by Roy Soltoff (the main originator of LDOS/TRSDOS 6) that may be of value in making our board available to the Model 4. Z80 machine designs that are not comparable to the Tandy Model

such as the Amstrad 464, 8256 and 8512, the Einstein-Tatung, the MSX machines, the Sinclair Spectrum, the Spectra-video and the Wren would require more software development. Some designs, such as the ZX81, may need modification of their casing due to its physical proximity to the CPU.

Should there be sufficient demand for this board, then later in the year we will manufacture additional PCBs so making the megabyte expansion system available in a kit-form comprising the main and interface PCBs, construction and software notes, circuit diagrams, instructions and information on the purchase of logic-control and other IC's. Software for running under LDOS 5.1.4 is developed and will also be available. By the Swindon meeting we may have an idea of the price, which will be at a discount for NATGUG members.

In past issues of this News letter Roy Barber reported on a review in 80 Micro of a ramdisk by Alpha Technology that could be run under TRSDOS 6.2 and Derek Trayler reported his experience with a ramdisk kit by Seatronics inc. running under NEWDOS and TRSDOS 6 and specifically aimed at the Model 4. Giving references to some of these reports is not straight forward but the following crib may help:

..... NATGUG Issue				Page	Author
As Printed	Chronological	Date			
Vol issue	Vol issue				
7 11	7 11	May	86	15	DT
7 12	7 12	Jun	86	10	RB
7 7	8 1	Jul	86	8	DT
8 8/9	8 2/3	Aug/Sep	86	17	DT

The columns under "As Printed" are produced by an algorithm that may have originated from Geoffrey Smith, and the columns under "Chronological" represent what we believe should have been printed. (The algorithm dictating the printed vol no. has nothing at all to do with me, I have always believed that the publisher used a random number generator to obtain these values - Ed)

Our board is neither American nor Dutch, is not specifically aimed at the Model 4 or any other Z80 design. It is in use on an LNW Model 1, a Tandy Model 1 board is undergoing testing.

Terence Harris and Ian Linehan 01-340-4227

OGGY OGGY OGGY

How awful, writing this in February but knowing that another Swindon meeting will be but a memory by the time that you read it! However, it does illustrate very well the deadline problems that our Editor and our Publisher must cope with - and it should emphasise the fact that YOU should be writing YOUR article NOW !

On that subject, I've just received the CPMSDOSUGUK magazine (January 87) and see that it has 214 pages. Now admittedly it isn't published monthly as has been NATGUG NEWS, it does include around 50 pages listing part of their Public Domain software library, and many of the letters seem to be from the newly-conscripted Amstrad users looking for CP/M software (and worse, Debugger, looking back at the glorious year of 1981, actually refers to a computer known as the Trash-80) - nonetheless it is a remarkable achievement in the Club Newsletter world. Add the fact that it is both typeset and bound and you can see that we still have a long way to go yet. Mind you, they don't publish answers to members' queries either !

80-Micro for February hasn't surfaced at WHS yet, so I have to re-read the January issue. 148 pages and although moving towards MS-DOS, still supporting well the Models I, III, and 4. I do like the Hardin Brothers series, after Laurie got me playing with machine code. Does any other reader see a likeness between Hardin and our dear Leo Knaggs ? Bruce Tonkin, of Creator fame, is writing a series entitled The Art of Programming and in this issue he compares the merits of Basic, Pascal, and C; based on current versions of Basic that is the language that he feels comes out on top. Surprised ? Being a Model 4 (and a I) user myself I have to admit that the MS-DOS material is not of any use to me, and I cannot comment on the quality - or otherwise - of it. I am still finding considerable value in the magazine for both of my machines and so I am pleased to support it.

Right. We are now planning the Autumn Swindon meeting so please communicate with any of the committee, or better still, with Natgug News so that we know what YOU want. Once again, my plea that if you ring me then please do it before 8.30pm !

Finally, another plea. I once had a dozen polystyrene disk mailers - if any have found their way to you then I'd be very grateful for their return. Thanks.

David Washford, 6 Houston Way, BA11 3EU. Tel: 0373 72739

Starting Out with MS-DOS

NATGUG's future seems rather uncertain at the moment, but if we do survive beyond the next AGM it seems inevitable that we will increasingly become an MS-DOS user group. Regular readers may remember that we took the MS-DOS route last summer, with a Tandy 3000. The ensuing months have been stimulating (not always pleasantly so), interesting, and often exasperating. At times it has been rather reminiscent of early Model 1 days, before NEWDOS 80 v 2 and MULTIDOS. DOS has gone through several versions, the latest being 3.2, and programs that run under version 2 often won't work with DOS 3 and vice versa (DOS 1, by all accounts, was primitive in the extreme and best quietly forgotten). Hardware add-ons like graphics cards come in more than one type - and of course software that runs with EGA cards doesn't with Hercules (and vice versa). MS DOS systems do offer a lot of nice things - but first a few warnings -

1. An undocumented 'feature' of MS DOS is that you can delete the entire contents of a directory by simply entering DEL (or ERASE) directoryname. I discovered this when trying to delete a file on the root when I was working in a subdirectory, and my finger slipped on the *.*!
2. Concatenating files with COPY , if there is not enough room on the disk, will lose files.
3. DOS's handling of directories seems a lot less robust than Montezuma's. Cross linking and loss of parts of files happen far too often for my comfort. No wonder there are all those file and directory recovery programs. (* This has not happened to me yet - thank God and Babbage - but I do suspect that Ariela's favourite program dBase II may have something to do with her problems - Ed*)
4. Copy protection is much more prevalent in MS-DOS software, with predictable results. If you have software protected by SOFTGUARD and are tempted to try a program called SUG.COM, it will deliberately destroy your data, including the hard disk directory.
5. If you are upgrading a dBase 2 application and have large files (as we do), be warned that file access becomes very much slower with the MS DOS version.

What does one gain with MS DOS? In a nutshell - much more powerful software and a lot more of it. You get 640K of useable memory, which means programs can be a lot larger (and most are) so they can do a lot more. Overlay files are needed much less often, larger blocks of data can be kept in memory and large ramdisks are possible, all of which speeds things up no end. I did our end-of-year diagnostic lists in a couple of evenings this year, instead of the usual week. You should be warned though that speed gains, at least compared with Montezuma CPM, will probably only be apparent if you have an 8086/80186/80286 based system or a fast option clone. The standard 8088 based pc, running at 4.77

seems rather slower than our 4P for most of the things that we want to do (which of course are not necessarily the things that you would want to do).

You can have complex high-res graphics and bigger and faster spreadsheets and calculation in general can be a lot faster. There is a lot of TSR (Terminate and Stay Resident) software - which means programs that can be used without having to leave whatever other program you are running. Until the (fairly) recent deluge of cheap clones, most IBM type PCs were bought by business and the cost of software was geared to that market. Luckily for the rest of us some machines clearly did go to computer enthusiasts and there is now a huge mass of public domain and shareware software, much more than is available for CPM, let alone for Tandy DOS's. Predictably they vary in quality and I've still not found any directory display or maintenance utilities to touch SD or SWEEP (* I think XTREE knocks spots of SWEEP, but OK it's not PD - Ed *). However, lots are excellent and include word processors, filing systems, ideas processors, communication programs, library utilities, DOS 'front-ends', artificial intelligence and all sorts of specialised applications. To finish, here is a list of just the public domain / shareware utilities on my MS DOS system disk -:

CED	command editor - retrieve and edit previous commands
LF	stop the extra printer line feed
QT	the time (roughly) in words
SEARCH	PATH that recognises OVL files
SETRAM	set up a ramdisk
LIST60H	excellent text file displayer
DBACK	back up directory & FAT tracks
DD	look at two directories at once
F	filter WS characters etc out
FCOMP	compare two files
FM	file modify - like Superzap / Edfile
FREE	free space on disk
FSPOOL	dump printer output to disk file
GLOBAL	execute a command in all directories
KERMIT	File transfer between machines
KEY-FAKE	Store keystrokes for programmes to use
KNEW	automatic backup of unbacked-files
LUX	execute a programme in a library file
MARK/RELEASE	control TSR programmes
NEWKEY	public domain PROKEY
NTREE	directory of all subdirectories / files
PSETTSR	set printer fonts, spacing etc. Memory resident
RAMFREE	How much ram is free
SCROLLK	make the scroll lock key do what it ought to
SD	poor imitation of CPMs SD
SETPRN	talk to the printer from DOS
SQTYPE	type squeezed files
UNERASE	retrieve deleted files
WHEREIS	find a file in any subdirectory.

Ariela Taylor - Northwood, Middlesex.

News from la belle France

DAISYWHEEL 2

Does anyone know anything about adjusting a Daisywheel II printer? Mine had a minor breakdown, necessitating a new bullet assembly, early in its life and when it returned from the Tandy repair shop it printed all the lower case letters at a different height from the upper. After a further visit to a Tandy repair shop, now under two guarantees, it printed just the same. The shop tested it using the self-test feature, which doesn't mix the cases, and so they do not see the problem, even when it has been reported to them. In addition there is Tandy's usual problem of staff who stay long enough to get a grounding and then leave for better prospects elsewhere.

I did not dare touch it at first, but I when I happened upon an old print-out that showed the almost perfect print quality the machine is capable of, I decided to do something myself. I found that the daisywheel carrier was hitting the solenoids, instead of the bump stops provided. Adjusting the former out of the way cured most of the problem. I adjusted things so that the bump stops do the work of stopping the carrier travel, leaving a few thou clearance from the solenoids. However there is another problem that is still not right, that is the evenness of the letters on paper; the lower part, and especially the lower left part, is only lightly printed. The descenders on p, j, g, etc. are almost invisible and the bottoms of most letters are lighter than the upper parts. This gives a mottled and uneven appearance to a page of text.

And recently it has started misprinting a few letters from time to time; the Daisywheel is obviously at half travel, between the top and bottom stops, when the stalk of the Daisywheel hits the paper. The result is that all that is visible is the bottom of one letter above the top of another one. This happens when the printer has been on for some time. It was something that happened also, I found, when the adjustments were wrong. It suggests that the solenoids are perhaps too far from the carrier and so unable to pull it into place. So I am in the position of knowing there is a fault and not seeing where to adjust to put it right. But the print quality, especially on thin paper, reminds me sometimes of an old typewriter that has seen better decades.

FATTER & FASTER

Not having seen mention of them in the journal, I repeat details culled from ads in 80-Micro, of several of the enhancements available for Models I to 100. Seatronics seems to have had all the reporting to date.

A conversion that is very similar to Seatronics' is offered by Alpha Technology Inc, 1902 Highway A1A, Indian Harbour Beach, Florida 32937, USA. You take out the existing memory chips from

your I, III or 4 and replace them with fatter ones, this in 256k increments up to 1 Megabyte max. They offer programs that configure the excess over your normal capacity as a Ramdisk, for TRSDOS 6 or LDOS 5.1. Prices start at \$230 for a 256k kit without the memory. They also offer speed-up kits, 5 MHz for the Model 4 costing \$70.

For the 4, 4P or 4D there is a microprocessor conversion offered by H. I. Tech Inc, PO Box 25404, Houston, Texas 77265. You replace the Z80 with a HD-64180 from Hitachi and you add memory to a total of 256k. They claim 8 MHz and compatibility with TRSDOS 6, CP/M 2.2 and ZCPR. \$300 unless you qualify for the introductory discount of \$30. They offer as an option a Ciarcia bus connection.

Not to be left out, the Model 100 also can swell to 256k. 224k expansion costs \$575 from PG Design Electronics, 37560 Thirty-one Mile Road, Richmond, MI 48062. 64k is \$300. The modules, complete with 6-year life power cell, sit in the expansion port housing. They are configured as 32k banks, and you copy data from bank to bank. Interestingly, the Model 102 8k memory expansion costs \$11 against \$25 for the 100. Are the 102's chips no longer CMOS?

UP TO DATE

LSI are offering a solution to their mean DOS, which only accepts dates previous to 1.1.88. LS-DOS 6.3 costs \$45, including overseas shipping and a surcharge for credit card orders. For that you get a full-screen Basic editor thrown in, plus time stamping on files and other improvements. Logical Systems Inc are at PO Box 55235, Grand Junction, CO 81505. But presumably Tandy will offer it as well. Or will they, if it's called LS-DOS?

LS-DOS 6.2 is also offered for the Models 2 and 12, \$53 plus overseas shipping from Misosys.

LDOS is now also being handled by Misosys, who are offering 5.3 in either a Model I or a Model III version, with enhancements similar to LS-DOS.

Misosys has developed and put in the public domain patches for TRSDOS 6 to enable it to handle 31 memory banks instead of the three standard. This will enable programs to be written that handle 1 Meg without recourse to a Ramdisk. If you send a disk, mailer and US postage to Misosys, (attn ATP), PO Box 239, Sterling, VA 22170-0239 they will send it you free. There is a little gentle warfare going on between Roy Soltoff of Misosys, who developed LDOS and TRSDOS 6, and LSI who own TRSDOS 6. And Roy is not averse to airing the differences.

When I tried a copy of TRSDOS 6.2 on my early Model 4, the directory display was incorrect - some files being shown twice. Will 6.3 show them three times?

All these juicy morsels make the mouth water. But the crunch is the price. A bit more hardware and a new program or two and you've seen the back of \$500. For that price you can get a quasi 16 bitter with 640k and an abundance of good programs that cost around \$30. Talking of which, remember that there is a public domain program that allows using Tandy printers with MSDOS machines; it filters out the unwanted linefeeds. If you want a copy I can let you have one. Alternatively you can set the Line Feed at half the normal, which has the same effect. Another way is to build a hardware filter which bars the linefeeds.

John Negus, Bessas, 07150 Vallon Pont d'Arc, France.

Evolution of a 1 mByte RAM board

Elsewhere in NATGUG Notes is the description of the present state of development of our Z80 megabyte expansion board and hard-disk interface. This describes the context in which it came about.

The simplest and most truthful reason is that we both wanted to, Ian could and (substituting one noun) we agree with the Water Rat - '...there is nothing, absolutely nothing half so much worth doing as simply messing ... about with microprocessors'. But there is a little more to it than that, such as having either insufficient time or intelligence to keep on keeping up with the "next" machine (let alone this one).

In part the design for this board originated during 1979/81 when we took a 500 Kilobyte program suite, previously running overlaid into the 120 Kilobyte partition on an IBM 360 and three IBM 370 data-bureaux, and re-programmed it to run on an in-house 32 Kilobyte Plessey "PDP 11 look-alike" (with an improvement in turnaround). At the same time we were interested in a Video-Genie-like Z80 design by a British company and in which we saw great possibilities for a teaching system based on "PILOT". Unfortunately the company and it's design were short-lived.

In 1983/6 the "PDP" processor-bound suite was transferred (and extended by our friend and colleague Jennifer A. Chambers) to run on a Tandy Model 1 at 1.77 Mhz with only about a 60% increase in running time. The Model 1 had (has) three 720 Kbyte floppy disk drives while the PDP-11 had four 2.5 megabyte fixed and top-loading exchangeable discs and a much faster data-bus. The running-time on the Tandy improved, although that was not a requirement, when we extended it's backing storage to a Winchester.

Over the period 1983/5 a 100 megabyte data-base was moved from the data bureaux, by then become IBM 370 - 380 / Amdahl / CDC Cyber, onto our Z80 Model 1 hybrid systems whose major circuit change was the replacement of Tandy PSUs with one Switch-Mode PSU providing power for the machine, CRT and all drives. The \$45,000 PDP-11 system was junked in September 1986, but the Model 1 hybrids remain.

The in-house minicomputer gave an annual saving (measurable in man-months) from time spent in keeping abreast of the edicts of mainframe Computer Bureaux Systems Oligarchs as they continually imposed changes to THEIR systems (whether institutional or commercial) on which their representative committee concurred. At that time a main-frame user could only hope for the smallest influence on any system change and that only on becoming an institutional politician: the parish councils had been replaced by Metropolitan Boroughs so-to-speak.

The PDP-11 also saved on slow turn-round, slow terminal response, access to archival tapes, waiting for inhibited processing quotas to become live, maximising processing

allocations and re-running lost jobs. The PDP-11 did generate other overheads which came from acting as computer-operator, - manager, and storeman but these overheads were smaller, instructive and immediately useful. The advantages that microprocessors offer over our mini-computer processing were clear by 1982. Microprocessors give large savings in the cost of hardware, annual maintenance, consumables and space, flexibility in access to key-boards, processing and development together with parallel processing and the ability to have in-house (even in our own houses) back-up. If they require taking on some of one's own machine maintenance this can be offset against more pleasure in, and control of, the job. Given this context, how splendid was the 6502, we thought, and how greatly superior the Z80.

And how naive. By 1983 the inexorable march of "progress" infected micro-processor CPU design. In rapid succession the Tandy models 1, 3 and 4, let alone the 2, 12 and 16, became antiquated - at least in the eyes of 'the professionals' - as will their successors. CPUs spread and mutate like viruses (nowadays you may prefer spring flowers as a simile): 8 bits are giving way to 16 or 32 (but see note *), the "now you see it now you don't" Z8000... , the 68008, the 8086, then the 80286 even now supplanted by the 80386 etc. No all hardware developments have merit - For example, some prefer reading a 64 x 16 video display easily and without spectacles to squinting at a 80 x 20 display.

Nor is the situation better in software: it seems that CP/M and the MS DOSes have intrinsic incompatibilities between editions and/or between data-formats whilst lacking facilities long available on LDOS or NEWDOS. The scintillation of GEM has moved between Intel and Zilog, but not all of us want GEM. Word-processing packages, line-editors, assemblers and compilers reappear as software houses "paint the lilly", but often as costly water-colours of earlier familiar software: Scripsit retains some advantages over Locoscript and Word-star. We did not see time spent in keeping up with these "improvements" as time well-spent.

The greater part of the stimulus for our board came as we saw that the advent of microprocessors might only divert time previously spent keeping up with unwelcome requirements of main-frame administration into overcoming unwanted facilities of new microprocessor CPU designs. Our prime need was not for new CPU design but for more RAM, some system ROM and a built-in hard-disc interface on our chosen CPU system leaving us with continuity to develop, expand and use our own software within a good and well-documented operating system over which we have some control. We did not want to be compelled into an uncontrollable vortex of "it must be better because it's new" machines costing our time and money but whose only measurable advantage was tabulation in "Which Computer ?" or a Design Council award.

In our spare time during 1984/5 we, in particular Ian in collaboration with Gerald Catling, set about writing patches to LDOS 5.1.4 for, and designing a 64K ram Z80 based machine intended to have more i/o, video and keyboard facilities than the BBC micro

but which would run much of the Tandy Model 1 software. Production became too expensive as manufacturers prices decreased over that time. During 1985 the interfaces to hard-disc and parallel input from Pericom standard document readers, which were parts of the design, were built by Ian and put into use on several of our Model 1s; they remain in operation.

We decided to incorporate the hard-disc logic and other features into a board allowing a megabyte of bank-switched RAM which we hope will let us carry on with tasks that we find worthwhile whilst continuing to use software we know well. If too many of our micros become irreparable we expect to be able to move our expansion board, operating system with revised patches and software to another Z80 based hardware design. We can put more of our man-months to good use and leave NEW chips to manufacturers, to those whose specialised requirements really gain advantage from them, to those starting now and to journalists. When and if we want to move software and data to a system based on another CPU, then we will do it because WE want to. After all, in the meantime it may be of more interest to try and integrate transputers into our own hybrids so that we can explore OCCAM-like languages on our own problems.

But as well as saving time, even though our program suites would possibly run on IBM "look alike" at around twice the speed on our hybrids, we happen to possess several Tandy Model 1s and their "look-alikes". A few sparrows in the hand are better than an infinity of peacocks in the bush - and much cheaper.

Terence Harris and Ian Linehan

* Note: At the time of writing the Apple IIs provide the major part of machine sales income for Apple Corp whilst sales of the Amstrad PCW have not been reduced by purchases of the PC - separate Reports in The Times, 1987.

Reading the Model 4 Screen

I have an accounting program which is used for several different clients. That is to say, each client has his own version of the base program, tailored in minor ways to suit his own needs. Since they are used in one office it is essential to see that a lay operator cannot muddle one program with another, as, for example, by using a data disk for one client with the program for another. With Models I and III this was no problem, as it was easy to look at the screen and read the disk name, but with the Model 4 it is a bit different.

The solution appeared, however in the May 1986 issue 80-Micro, page 60. There Roberto Refinetti demonstrated how to peek and poke the Model 4 screen.

The original version involves a machine code subroutine which is put into memory and called when required. My version, which I only use to identify disks, is created as needed and then thrown away.

The routine is as follows:-

```
10 ASS$=CHR$(126)+CHR$(103)+CHR$(26)+CHR$(111)+CHR$(62)
   +CHR$(15)+CHR$(6)+CHR$(1)+CHR$(239)+CHR$(33)+CHR$(32)
   +CHR$(32)+CHR$(119)+CHR$(201)
20 A=VARPTR(ASS$)+1:A=PEEK(A)+PEEK(A+1)*256:CHAR%=1:
   A2=VARPTR(CHAR%):IF A2<0 THEN A2=A2+65536
30 B2%=INT(A2/256):B1%=INT((A2/256-B2%)*256)
40 POKE A+10,B1%:POKE A+11,B2%:PEAK=A:A=0:B%=0:A2%=0:B1%=0
   B2%=0:I=0:REM The routine is set up, now DO IT
50 CLS:DIR$="DIR Z:"+RIGHT$(STR$(DR,1)):SYSTEM"DIR$"
60 A$="":X%=0:FOR Y%=10 TO 17:CALL PEAK(X%,Y%)
70 A$=A$+CHR$(CHAR%):NEXT:RETURN
```

Operation is quite simple. Set DR to the drive number you wish to check, and call the subroutine. It will set up the machine code routine, call the directory of the disk to be tested, and return with the first 8 characters of the disk name in A\$. This is then compared, using INSTR, with the required diskname, and if wrong an error message is displayed on the screen with instructions to change the disk. The new disk is then interrogated in the same way.

The instruction "DIR Z:" is used because I have no files starting with Z on any of the disks involved, so of course only the heading of the directory is displayed. It is of course essential to CLS first, so that the heading appears on the top line of the screen

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