

# Einstein Magazine

**& ALL MICRO NEWS**

**Number 99**

Published for users of Einstein (and other) computers  
by RPM Society.

**Publisher and Secretary:-**

**A E Adams, Ivy Cottage, Church road, New Romney,  
KENT TN28 8TY**

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**EDITOR: Bob Deeley**

**33 Britain St., Dunstable, Beds. LU5 4JA**

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**SHOWS, SOFTWARE LIBRARY and USEFUL BITS**  
**Steve Potts 85 Thorold Ave, Cranwell Village, Lincs.**  
**NG34 8DS**

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EINSTEIN MAGAZINE and all micro news No.99  
Rumblings from Romney Marsh

Editor Bob Deeley really caught me on the hop in this, the first of his "All Home Grown" issues of your favourite mag.

"Oho!, quoth I, back to a 24-page magazine again, are we?" Having items of bumph about other groups to include with it, I decided to forget about a separate cover, & just print the outer text pages on coloured paper, as in the days of yore.

Until I'd printed the first side and realised that something had gone horribly wrong. We print 4 pages of A5 per A4 sheet and 4 goes into 24 OK, but Bob had sent me 24 pages of text PLUS a Masthead/Contents page, and 4 into 25 just won't go!

Having located the ON switch for my brain (I'd not needed to use it for months!) the rather neat get-out solution that you see before you presented itself to me -- so here it is.

Bob's editorial in this issue relates his problems in trying to come to grips with inherent incompatibilities between differing versions of the bloatware that modern PCs insist on imposing on you, to achieve unfamiliar tasks. In Word For Windows there ought to be a command tucked away somewhere to set up a table in regular columns, but at Rumbling Romney we are still using MsDos ver 5.0 to run WordStar 4 & dBASE 3+.

John Marriott refers to Ted's (EM94) ADC project, ADC inputs and Dave Arts' earlier articles. We don't have a complete listing at Romney, but Dave's user port articles/projects appeared in Einstein Monthly 2/1, 2/5, 2/8, 2/11 & All Micro News 1/5, while he thoroughly explored the possibilities of using the Tatung "Pipe" as an alternative input/output port in Alternative Micro News 1/4, 1/5 and All Micro News 1/1.

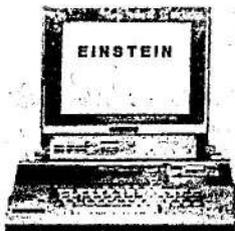
Dave's article in AMN 1/2 is referred to in the heading at the top of p.9, but this was an article on adapting the Commodore C128 musical overlay keyboard for use on Einey.

Dave's articles on interfacing the Amiga mouse to Einey and on building a graphic digitiser started in AMN 1/12 and 2/1 -- Graham Bettany's final issues from Ipswich before he gave up on the Einstein in June 1993 as "a lost cause that isn't worth the effort of trying to keep alive any longer".

Tony's 1st issue was AMN 65, & Dave's digitiser project started in AMN 66 and continued in AMN 67, 68, 69 and 70.

All these back numbers (and indeed EVERY issue back to EM 1/4) are available on request from Tony at New Romney. Just say which issues you need & enclose an unused 1st class postage stamp in payment for each back number you require.

Where are the 5 programs that John refers to at the foot of p.7 Bob? Are they the same as in AMN 66-70, or has John invented a new wheel that you will tell us about next time?



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## THE COLONEL STEPHENS SOCIETY



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Ashover Light Rly, The Hundred of Manhood and Selsey Tramway  
East Kent Rly, Snailbeach District Rlys, Welsh Highland Rly,  
Rother Valley Rly (K&ESR), Edge Hill Rly, Festiniog Rly,  
Sheppy Light Rly, Burry Port & Gwendraeth Valley Rly,  
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## Bob's Editorial

Have you ever asked at the ticket office for directions on a railway station, turned as directed, followed the sub way, ascended the steps to the platform, only to witness your train with its confirming destination head-code pull-in on the platform across the tracks. Being impossible to get to before it departs. Well it happened to me on 'the el' in Chicago, of all places, the other week. The feelings generated echoed similar frustrations I had been suffering with the Company's I.T. department though being for a more protracted period were less easily identified until this enlightening experience. The moral being: beware of the experts; work it out for yourself.

The solution for me has been to choose my own PC equipment software and vendor - I'm completely on my own again, just like I used to be. The snag to all this has been that I've been without a PC for about four months, that's the time it takes between getting the initial OK, when the previous machine broke down, to picking up the new PC - the interim being occupied by obtaining quotations authorization delivery ect. This naturally hasn't aided the EM publication - not in the short term at any rate. Well now I have all this great kit has it all been plain sailing? Indeed no! Let me explain...

One of the benefits has been the addition of a scanner to my tools - thought it a good idea to capture data sheets... that is all the little scraps of paper one accumulates from new pieces of equipment. These sheets being so carefully filed away one can never lay hands on when the batteries have run flat five years later and the gear requires setting up again, rendering it obsolete.

I thought I would use this scanner to transfer stuff into the magazine, after three weeks playing with the O.C.R. software I managed to get the two main articles appearing in this issue into files - sketches and drawings excepted; that was another problem for another day.

Now back to the desk top publishing (D.T.P.) learning curve, as I began to work with this software again things didn't seem so bad, many of the techniques Ted had demonstrated and previous problems encountered, we having discussed and overcome together, started coming back to me. I found this quite reassuring. However horror struck as I looked back over the code listings of the Silicon Disk article to see them disintegrate into a jumble of letters and numbers where previously they had appeared in orderly fashion as columns within a neat formatting device called a table.

Nothing I could do improved things and my conclusions were that the word processor's hidden formatting codes on this new machine are more modern and no doubt more powerful and not understood by the older D.T.P. program. I tried another D.T.P. application Home Publishing, from the same source as the word processor, this failed to give results in a similar fashion - I suppose the word Home in the name means it's a cut down version of the real thing.

What's to be done? I didn't want to ditch all the O.C.R. work I had done and to copy everything in from scratch without error was a daunting prospect. So I have stuck with the word processor and tried to adapt it to do a D.T.P. job - yet another gigantic task.

The reason I am relaying all this to you the longsuffering reader is to suggest that if you have been having problems with updating your methods or learning new package or finding your way around a piece of software for the first time and given up with the experts or merely find them too expensive, don't struggle alone but air your difficulties within these pages. Others have already passed that way: likewise you some of theirs'. I'm sure we can find mutual help and begin to enjoy the road to gaining confidence on our computers of whatever description, all the more.

So starting with me, is there anyone who can help with R.T.F. that is rich text format, to understand it better, what are the standards for it and the codes behind it, are they listed anywhere and can they be adapted customized or controlled in anyway? Or are packages such as Word there to patronize one? Here's an example: After grappling with the alignments of a table - no not the sort that's accumulating coffee cups - for three hours I became aware of a strange little creature jumping up and down in the lower corner of the screen offering to help, a caption bubble emanated from it saying to me, 'I think you are trying to write a letter choose a style sheet'! My particular problems are peculiar to technical publishing where segments of listings need to be retained in neat columns and rows amongst proportioned and paginated text. Any suggestions most welcome.

Another thing to have some up-to-date suggestions on is the best format for submitting material; this has been raised from time to time in the past. Paper source seems feasible now we have scanners and powerful O.C.R. software available but these aren't all they're cracked up to be, more rules need to

be adhered to for this type of transfer to be successful, the process must be speeded up somehow, less correcting by POM, fonts must be chosen with caution and 9 pin dot matrix prints are definitely out.

—@@@—

## Graphics Digitiser

For The TC01

*By John Marriott*

Over the last few months I have been trying to develop a Graphic Digitiser for use on the TC01. Much the pity that I did not have precognition of Ted Cawkwell's ADC project in EM94 as I was learning out the hard way that there are ADC inputs, and then again ADC inputs! To this I refer to the BBC-B, for back 12 years ago I built a graphic digitiser based on the "pantograph toy" with rotary potentiometers at the "datum" and "elbow" points and from their derived voltages, plus COS & SIN Trig managed to get some "acceptable" screen plots from "simple line" newspaper cartoons - the only problem being a printer screen dump aspect ratio.

One of the problems encountered was the small voltage variation/change as there is only a derived maximum of 90 degrees movement to a 270 degree potentiometer e.g. 2V reference voltage divided by (24 lines X 8 bytes) plus mechanical "slop" equates to plotting to the nearest 4th pixel! A simple "radio dial" step-up pulley/cord system to utilise the full 270 degrees presented friction problems, whilst straight slider pots set up to obtain a similar step-up ratio presented "formula conversion from angular to linear movement" with a

"suck it and see" attitude as maths went past my comprehension...

...I'm pre-£.s.d (plus farthings) days, with the beads on my abacus sadly depleted!

Laughingly, my sons old school (CDT Master) provided me with some resistance wire which I jury-lathe tight-wound over a 6" length on a knitting needle, transferred to a slightly larger thermoplastic round rod and putting it under length/stretch tension so that the coils were adjacent but not touching, heated the wire by running a 5amp current through it which superficially bedded the wire into the plastic rod. I then thoroughly warmed this assembly with a powerful hairdryer (NOT paint stripper gun!) and formed it to a suitable 50-degree arc. In modesty (bloody great surprise on my part!) it looked good and jury-rig testing it showed promise.

As ever, the second one was a swine - mainly to the fact that the wire "looped" and went into a "knot" then happily sliced the tips of finger and thumb as it went through, so everything after that was blood and sticking plaster. Because this "resistive quadrant" didn't have the same solid mechanical location, being the "elbow" rather than the "shoulder" pivot (other forms of positive/remote/pulley tests being tried), I felt that this was going past the reasonable capabilities of EM Readers, and no offence intended! Part of the main problem was mechanical stricture as there was always going to be the problem of accuracy in trying to plot 49152 pixel points. Theoretically I "looked" at "interrupted photo-transistor" beams which left me with the problem that I would need two 8-bit Ports in order to meet the 256(X) and 192(Y) values

which means whilst the printer port would have to be utilised INWARDS Oust tell your computer nicely! Which would mean saving off the screen, shutting down, refitting the printer lead ... & etc. As there would be no friction stricture (other than the step-up mechanical components) the problem lay in creating a GREY SCALE disc.

We are used to the BINARY "change" where TWO "states" change as we count (black-in pixels 0:2:4:8:16 etc.) which can be confusing where a computer is "sense counting" any change. The GREY SCALE only changes ONE, and unless you are actually looking at an example is nigh on impossible to explain diagrammatically! To try and "colour in" a disk for such a project would be daunting, and whilst these disks can be purchased (!) they are priced Commercially.

Ted Cawkwell had mentioned in one of his letters to me the Amiga mouse, but until recently I could find no reference to its use/installation, that is until I purchased a "retiring Einer's rig" and found Dave Arts article in the "All Micro News Vol 1/12 March". Whilst I have an Amiga 500+ it didn't come with a mouse (ex-boot sale cheap!), until I managed to source a Quick Shot Optimal mouse. At this point I must add that it has a 300 DPI Resolution with the Amiga Workbench having the option of changing its "speed", so I don't know if the "issue" mouse has the same resolution - the point being that there is some "magnification" of the picture being scanned to that being digitised on the screen. I have disassembled Dave's "MOUSE.OBJ" file (there is the capability of extra code to show the X-Y pointer position to screen) but as the program stands it is simply functional.

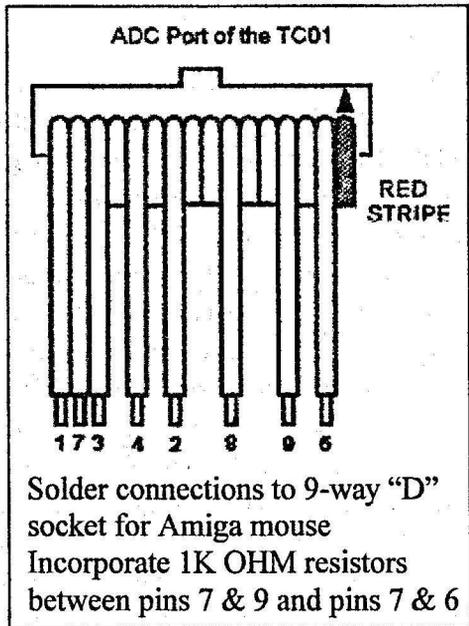
The main problem with using a mouse as a "digitiser head" is the fact that any small rotation of the mouse body whilst "reading" a (say) line will destroy its "relationship" to the original datum point i.e.  $X=0$ ,  $Y=0$  so there is a mechanical need to ensure that no rotational movement can take place. An obvious solution is to have a vertical bar sliding along a horizontal bar with the mouse "attached/sliding" on the former, so allowing full X-Y movement - but tolerances and mechanical leverage stricture says otherwise. The solution proved to be simple - that of 2 parallelograms sharing a common datum point, which happens to be "L" shaped!

My initial model (which works so well I've not bothered to go on to the Mark 2) was made from stiff card (backing board from the Daler Series 'A' A3 art drawing pad) and pivots pins from ordinary "soft" dressmaker's pins. The "secret" is accurate measurement and hole alignment/tightness (holes are 5mm in from the edges and central, not shown clearly on the sketches), which I marked with a dart point BUT drilled through with a pin (cut head off and use light/slow speed screwdriver/drill) to ensure pivot hole tightness. Due to the shape of the Quick shot mouse its alignment in its "housing" to the datum point/relationship was close, BUT - as the original Amiga mouse has nice straight edges, this should not present a problem. There are no washers between the card pieces, the 10mm X 10mm pieces being "capping" for the pins to be bent over. At this point I should also mention that dressmaker's pins can be of the hardened type ... DON'T try bending these!

Hopefully, we can have a list out of the 5 programs (sorry Bob!) and do REMEMBER to save them before running them!

In the original article it was suggested fitting a 1K resistor between pins 15 & 2 and pins 15 & 4 to cure "misreading" of the buttons. In the "RATP" program I've included a couple of extra lines to provide further "choices". A CALL &8025<e> will bring back a screen from memory, left button plot/unplot, right button return to BASIC.

The small interface lead between the USER Port and Amiga mouse needs no real explanation - but whilst I sourced my IDC 16-way connector from a PC disk/printer port board's leads it had the nasty surprise of NOT having socket pin 16! Whilst it was easy enough to pinch the un-used socket pin 1, make sure your scrap box/boot sale purchase has 16 wires to its ribbon. Whilst this is not proof positive that all 16 socket pins will be in the IDC connector, you can but hope...

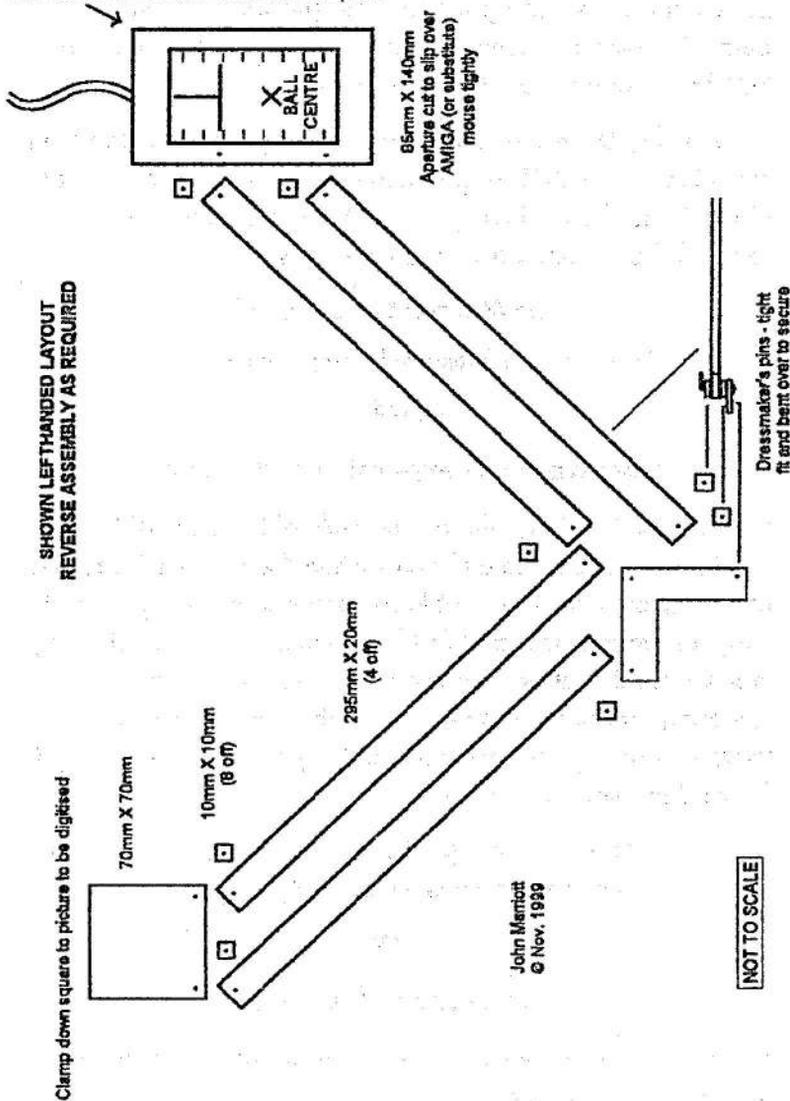


...as I have found to my cost where Amstrad printer ribbon cables are concerned, but yet another story!

Hopefully I shall have a look at the cheap/readily available PC Serial mouse, but as this requires a CLOCK signal (from

EINSTEIN TC01 GRAPHIC DIGITISER - TO BE USED IN CONJUNCTION WITH PROGRAMS IN THE "ALL MICRO NEWS V1/2" BY D. ARTS

This corner to be used as cross-hair point



John Merritt  
© Nov. 1999

The Tatung PIPE?) And I haven't yet got to grips with the Hardware Manual to see how/what/where signal levels can be taken before stalling the Beastie, probably another "back burner" hoping that someone else will have solved it already BUT hasn't thought to tell the rest of us

Incidentally, Dave Arts did a Graphic Digitiser in/around All MicroNews Vol 2/2 (or perhaps it folded before seeing light of day?), so if any Einer has it out there we'd be interested to see how Dave handled it - and its results?

*John Marriott © Nov. 1999*

Ed. More of this project to follow plus those listings

—@@@—

They were too expensive at the time...

States Dean Bradley, who has recently obtained a TC-01 plus monitor and disks, remembering when the Einstein Computer first went on sale. I was able to help out, referring Dean to Tony for membership and EM back numbers also sending my monitor lead that was missing from his rig - must get the soldering iron out and make up another one. We hope every thing is working for you and making some progress, look forward to hearing from you.

Have your questions and answers  
published here in the EM help pages

—@@@—

The Einstein Web Site

We have some information on this now; Ken Ross has set it up, this is what he says...

## Einstein Magazine No.99/11

Here's the info about accessing the Einey site on tripod, I've kept the design of the site very simple, with no frames ect just tables to tidy things up.

[http://members.tripod.co.uk/~tatung\\_einstien](http://members.tripod.co.uk/~tatung_einstien)

Is where it's at!

[ftp://tatung\\_einstein:qwcdwr@ftp.tripod.co.uk/](ftp://tatung_einstein:qwcdwr@ftp.tripod.co.uk/)

If you upload via a browser or via ftp prg

Ken Ross can be contacted by his email...

[cbm8032@bigfoot.com](mailto:cbm8032@bigfoot.com)

-@@@-

### You've seen it here first!

Published in E.M. 98... the reply actually precedes the letter in question! The mix-up happened somehow in the editorial changeover - I thought Ted had said he had put it in EM 97, so I placed the reply in the edition I was working on. This raises the point that what with my inexperience and the overlap (EM 98 was actually on the go before 97 was completed!) your article or letter may have been missed out. Duplicates of letters and prospective articles have been posted in all directions during this year, and possibly may have been considered already dealt with. So please speak up, or just send in it again, even if it is something you think is no longer topical - a problem I also am coming to terms with - although in this instance, months later the saga of the Bletchley Park Enigma Machine theft still continues to unfold. So here then were my thoughts at that time (plus the reply -

repeated to save any further confusion) with allusion to our collective care needed for preserving The Einey micro.

theclebylark@gapement.com

The item in question had resided there for years, it didn't possess those qualities that would draw attention to it, even so, and it was laden with special features. These were all discreetly hidden or disguised, in such a way it could only have possibly been designed with that low key approach, a British inventor would naturally have chosen to take. Oh, didn't you know... that's right! It all started off here, in England, and had been adopted into the enemy camp later on. No, if there was any attention, given to it at all, it was usually accompanied by comments of nostalgia 'I remember these', 'what ever happened to the one I once had', 'I cut my teeth on this thing'... And there it had dwelt undisturbed, in a dim musty corner.

Now, it was gone! Probably missing for some time, plenty else had commanded attention that day. Of the likely culprits, it could have been those characters in blue suits; they might have hidden it under one of the raincoats draped over their arms - too prepared for the English weather! Professional job so they say, glass not broken not even a scratch around the lock. Truth to tell the case wasn't properly finished, the back was off and no one had said anything about it - well one wouldn't when it was transparently obvious.

So there you have it, the case for it wasn't founded enough, the curator hadn't done enough to secure it, the curious hadn't made enough noise for it to be considered worthy enough for

special attention, and it had been low profile enough to remain as just another exhibit to the untrained eye. It is said there are still enough around in people's attics and garages - whoever was to have known enough that it was one of only three early-unmodified models remaining. Nuff said.

*Merely Mistaken As Outdated (repeated for continuity)*

I was loath to make any explanation at the time of writing the piece on lost or stolen artefacts in the previous EM as I wanted to preserve a cryptic element, but for those of us who still think of their Eineys as the latest or best thing around, I am not knocking that. In fact it is a great strength to hear einstien-computer-users, speaking as if the machine had only arrived on the scene yesterday.

Near to where I live there's a radio engineer with a house literally full of tubes, valves that is, the glass, orange glowing variety. I spent a fascinating evening there one time. The thing that stuck me most was that the fellow spoke of them as if they were current technology, and do you know the reason why? Because they are! Being used by the military and found in high end radio transmission and Hi-fi fields, to name a few current applications.



However we all know of many things, once common, that have only recently become items of great interest - now having all but disappeared. And we also know the adage 'history repeats itself.'

*continued on page 16*

## MURPHY'S FLAW

© John Marriott 6.2000

Now, some 50 years ago I stumbled upon the true definition of Murphy's Law, and it is only recent events, that has given me the courage to publish my findings. It all came about when, at the age of 14 I half filled a test tube with distilled water, place my thumb over the open end and shook the test tube vigorously...

...and the test tube exploded! The thought ran through my mind, as I sat in Detention later that day for "deliberately destroying School Property", could it have been the cause of differential heat expansion, i.e. cold water inside, hot hand outside? From my own chemistry set I tried the same experiment, and the same thing happened! My feelings were rather mixed, for test tubes were not only expensive but also hard to come by.

With the strange logic of a child I decided to try it with a "third of a pint" school milk bottle. Try as I might, those bottles stayed intact ...and light dawned - it was the inconvenience and scarcity which were the deciding factors!

This has been refined to "embarrassment factor", mainly through personal bodily function events! In those days trousers had button-flies, with "time and body reaction" to undoing those buttons, dropping ones trousers, sifting down and evacuating being a rather slick and fully automated action. That is until one's waistband button somehow gets caught in the buttonhole surround stitching and...

...then there was that IZAL roll toilet paper - it appeared to be

made from cheap Christmas present wrapping paper, unbleached off-white, dull on one side, shiny the other and a most peculiar smell. It was the perforations which caused the problem - like a series of "WWWWW" across the paper almost to 95% paring - yet it NEVER parted across there, anywhere but! I won't increase my embarrassment by pointing out where the perforation ALWAYS finished.

Now, this effect exists even to this day, not only in toilet paper of all grades and qualities, but also chequebooks! Have you notice how close the perforations have become yet still the cheques refuse to part at that point. I must admit that I was glad when the stamp machines, which issued stamps off the roll, went, for that was a great source of two-thirds of a stamp only!

Some years ago there was a Science Fiction story based on this principle and my heart jumped as I thought "...at last...", alas to be short-lived as I read of his death in a mysterious car crash in America, although his body was never found and there was only some minor fender (bumper) damage in the car park, but...

...until today, in THE ENGINEER (9.6.2000) Technology News section, in an article entitled "Strong material design is full of holes" by Jon Excell [www.unistates.com](http://www.unistates.com) where it is claimed that a "...material with a porous (full of holes) structure can strengthen a plane...". As I am lead to believe, Boeing have got 50-odd apprentices drilling holes in a current 777's main wing spar with the intention of evaluating serviceability and cost/weight savings. Despite Boeing's offers of excellent terminal bonuses (poor choice of words?) there have been no takers, with (perhaps?) Jon Excell

observations that this theory is based on Reflexive Materials Technology (RMT) and appears to work within the confines of computer simulation being partly to blame...

...in fact it WILL work - because it meets the criteria of maximum "embarrassment factor" to the n'th degree - which of course is why Murphy's Law has such a dampening control over Civilization's advance...

...do you want to be the first one to prove to everybody you're a Nerd!

—@@@—

From page 13 - *You have seen it here first*

I suggest we need to spot now, that which will be rare in thirty years time and cultivate awareness for it. Unfortunately that's not at all easy, by definition it is the very thing we are tripping over today.

Postscript

Past publication in EM of articles on Bletchley Park and reviews by EUG members visiting this war-time deciphering center, have struck a chord with many of our readers who no doubt like me want to see established a secure future for this historic preserve, and will have been dismayed to learn of the theft of the special enigma machine. If you are involved at Bletchley Park, connected with it in any way, or able to visit: then bring us up to date on what is happening there, your reactions, what you think. *Nothing elaborate is required - and I'll do my best for you with the spelling and grammar checker.*

—@@@—

## The Einstein Silicon Disk

*By Ted Cawkwell*

Designed at a time when a 10Mb HD disk for a PC was the big thing, it seemed very expensive, but when you consider that it provided 244 kb of very fast Ram, and could speed up access by as much as 10 times normal, it was let down by the other software struggling to keep up.

Dick Keynes, who lent me all the original material, especially Cracker to go with it, had got a lot of stuff, far beyond me - I have hardly ever used Cracker - but it churned out tables and graphs at enormous rates and it was easy to see how valuable this was. Data on drive 3, the Sildisk does not survive a reset, so it must be saved to another disk before closing down the machine. A 3.5" DS disk is big enough to hold all 244 KB, so I use drive 2 on my machine, which is also big enough to hold other programs I need to use - like my mouse driven drawing program Sketchm.

The fact that the usefulness of being able to use the disk on drive 0: - because so many programs are written to take their initial access from it - has been recognised, and the short file Sild0.com when Run achieves this objective. The Sildisk becoming drive 0: and the original drive 0: now being found as drive 3: [Ed. I wonder what happens to the drive that is connected as 3: - if so configured?]

By changing one byte in the Sild0 code it becomes possible to make Sild1 and Sild2 core files so that the logical drive becomes the boot drive without any hardware change.

Interesting now, but perhaps even more so to some future user! If I could get to spend more time at the keyboard I have some ideas yet about the use of Sketch, which I would like to explore with the BJC4100. Well, you never know, it might be worth watching this space for a while.

The accompanying three pages of techie stuff about logical drives will guide anyone more interested in development.

(Dick Keynes Page 1)

Provision has been made in the silicon disc ROM for logical (DOS) disc drive to physical (MOS) disc drive mapping. The routine that accomplishes this the patched DOS drive select routine 7SLDSC. This routine uses a special silicon disc variable at address FDFH to determine which physical drive corresponds to which Logical drive. This variable is interpreted in the following way:

- Bits 0,1 give physical drive number for logical drive 0
- Bits 2,3 give physical drive number for logical drive 1
- Bits 4,5 give physical drive number for logical drive 2
- Bits 6,7 give physical drive number for logical drive 3

The default value is E4H or 11100100B, which gives a logical-to-physical mapping of 0-0, 1-1, -2-2, and 3-3.

*Note: The 'B' after zeros and ones means BINARY notation*

The main reason for having disc drive mapping is so that the silicon disc can be configured as drive 0 when using the DOS, making programs which refer to drive 0 when loading, for example, do so much more quickly.

The following code makes the silicon disc act as logical drive 0, physical drive 0 act as logical drive 1, physical drive 1 act

as logical drive 2 and physical drive 2 act as logical drive 3. Alternatively, the MOS 'M' command could be used.

LD A, 93H

LD (FDFH), A

Logical-to-physical drive mapping is purely a software feature operating within the DOS and requires no hardware changes to any floppy disc drive.

When the silicon disc is logical drive 0, it may be found that physical drive 0 is accessed when a program is loaded or exited. This is because the DOS warm-boot routine loads the DOS from MOS (physical) drive 0, and then selects DOS (logical) drive 0. The solution is to patch the DOS warm-boot routine to load the DOS from the silicon disc, after copying the DOS onto the silicon disc.

Example:

|           |               |               |               |
|-----------|---------------|---------------|---------------|
|           | D3 = 0        | D2 = 0        | D1 = 0        |
| Log.Drv.  | 3 2 1 0       | 3 2 1 0       | 3 2 1 0       |
| (FDEF)    | 10010011 =93H | 11010010 =D2H | 11100001 =E1H |
| Phys.Drv. | 2 1 0 3       | 3 1 0 2       | 3 2 0 1       |

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|      |           |                       |
|------|-----------|-----------------------|
| LD   | BC, 0     | Track 0, sector 0     |
| LD   | DE, 5A00H | End address for DOS   |
| LD   | HL, 4000H | Start address for DOS |
| PUSH | BC        |                       |
| PUSH | DE        |                       |
| PUSH | HL        |                       |
| XOR  | A         | Physical drive 0      |
| RST  | 8         |                       |
| DB   | A1H       | Read block            |

|     |     |                  |
|-----|-----|------------------|
| POP | HL  |                  |
| POP | DE  |                  |
| POP | BC  |                  |
| LD  | A,3 | Physical drive 3 |
| RST | 8   |                  |
| DB  | A5H | Write block      |

The code in the warm-boot routine for DOS version 1.31 that loads the DOS from disc is given below.

|        |     |          |                               |
|--------|-----|----------|-------------------------------|
| 0000H: | JP  | FA03H    | Jump to BIOS warm-boot jump   |
| FA03H: | JF  | FAC9H    | Jump to warm-boot routine     |
| FA09H: | LD  | SP,0100H | Reset stack                   |
|        | LD  | HL,E100H | Start address for DOS loaded  |
|        | LD  | DE,EC00H | End address for DOS to load   |
|        | XOR | A        | Physical drive 0              |
|        | LD  | B,A      | Start at sector 0             |
|        | LD  | C,A      | Start at track 0              |
|        | RST | 8        |                               |
| FAD6H: | DB  | A4H      | Load DOS (MCAL routine ZRBLK) |

The silicon disc ROM contain new MCAL routine, function 1 on number FFH, that simply calls ZRBLK after loading register A with the value. Therefore, to load the DOS from silicon disc, it is only necessary to change the MCAL number A4H to FFH. The following code patches DOS version 1.31. File MOS 'M' command could be used if wished.

```
LD A,FFH
LD (FAD6H),A
```

Note that the address of the warm-boot routine and the start and end addresses for the DOS to load will vary from one version of the DOS to another. Over leaf is a program that patches the warm-boot routine which works for all 1 DOS versions it also copies the DOS from physical drive 0 to the silicon 1 disc that it then makes logical drive 0. The program is re-locatable and should be executed from drive 0. If the program is run from the silicon disc, an error will occur when the program warm-boots, since logical drive 3 has been mapped to physical drive 2, unless physical drive 2 is present.

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Firstly, copy to DOS.

```
LE      BC,0
LD      DE,5A00H
LD      HL,4000H
PUSH   BC
PUSH   DE
PUSH   HL
XOR    A
RST    8
DB     A4H      Read DOS from physical drive 0
POP    HL
POP    DE
POP    BC
LD     A,3
RST    8
```

Now patch Warm-boot routine.

```

LD    HL, (0001H)  HL -> BIOS warm boot jump
INC   HL           Skip 'JP'
LD    E, (HL)
INC   HL
LD    D, (HL)      DE -> warm-boot routine
EX    DE, HL       HL -> warm-boot routine
LD    BC,0
LD    A, CFH
CPIR                Search for `RST 8'
LD    (HL),0FFH    Change A4H to FFH

```

Finally, make silicon disc logical drive 0.

```

LD    A,93H
LD    (FDFFH),A
RST   0

```

A hex dump for this program is given below.

```

01  00  00  11  00  5A  21  00
40  C5  D5  E3  AF  CF  A4  E1
D1  C1  3E  03  CF  A5  2A  01
00  23  5E  23  56  EB  01  00
00  3E  CF  ED  B1  36  FF  3E
93  32  FF  FD  C7

```

The above program can easily be made into a .COM file by loading the hexadecimal values from address 0100H onwards using the MOS `M' command and then saving on disc using the DOS `SAVE' command.

Ed. Up to the hex dump completes the understanding part, now Dick has kindly supplied it in coded form (this last section) for easy entry - see if you can follow it through. Remember bytes for addresses are reversed the least significant part comes first and are not mistakes in being different from the preceding assembler form.

—@@@—

### Simple Thinking

Even the mighty Microsoft® has admitted falling prey to the illegal activity of unscrupulous hackers or should they be described as shortsighted... probably both. Let's just suppose for a moment that someone could succeed in grabbing the entire source code for an operating system like windows 98, this might then be re-written and adapted as a superior product. Microsoft® would respond by making its software public domain to ensure it keeps the platform for the rest of its products. The outcome could be the perpetuation of the Microsoft® operating system as the main one - do we really want this? The unscrupulous hackers and sworn enemies of Microsoft certainly wouldn't. One could say they are about to score a home goal if they're not too careful. How does an organization as wealthy and powerful as Microsoft® allow itself to be infiltrated anyway? One can only assume it possess a self-awareness of the antagonism and vehemence against it, and its founder particularly, engenders. This is apparent internationally and most acute in the U.S. One would could be forgiven for thinking Microsoft® would have utilized its vast recourses to proffer the greatest possible security for itself.

My theory is that the Microsoft® organization is as much a victim to the over complexity found in computing these days as the rest of us, it being a major contributor. Yes I know! It's because of the ever-increasing demands for functionality by us, the users. This complexity is what makes it possible for hackers to sneak in, through planting apparently innocuous programs such as Notepad, in this instance, or a simple visual basic program as in the love bug virus. The point I am making is that the obvious is easily overlooked amidst overly complicated systems.

Possible evidence of our instinctive human reaction against the ever-increasing complexity of modern living can be seen in the rising interest in a minimalist culture. The minimalist movement is constantly developing; in its art, photography, film, music, and home décor. It would seem many of us would seek a minimalist lifestyle where one can at least during periods of relaxation, through being surrounded by such influence, possibly be able to counteract to some extent the effect of the onslaught of ever increasing technical demands found in ones work, travel, essential utilities, services, making purchase decisions... to name just a few areas.

I wonder how the TC-01 fares in all this?

—@@@—

Mike Moore of Weston-S-Mare Somerset has been clearing out his garage and has come across several items that may be of interest to some users. Tel: 01934-627626 Email address: [mikemoore@owsm.fsnet.co.uk](mailto:mikemoore@owsm.fsnet.co.uk)  
One brand new 80 column monochrome unit, a complete set of original manuals, several discs, monopoly, scrabble genius, turbo chess, home budget database, Flight pass737, and also some cables and a joystick - all for sale.