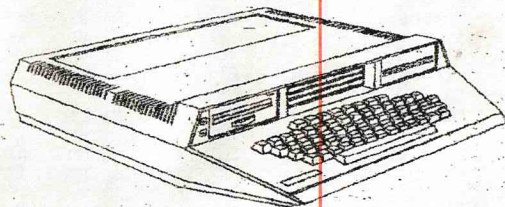


EINSTEIN MAGAZINE

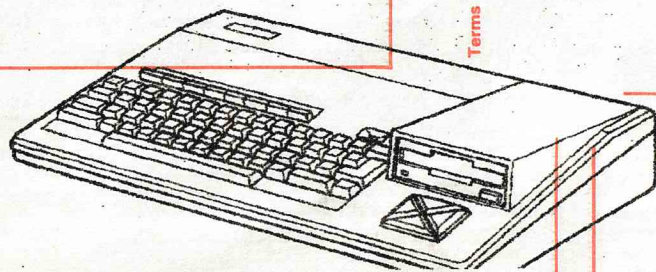
No. 83

TATUNG
Einstein

TC-01 AND TC-01A
COLOUR MICRO COMPUTER



TATUNG
Einstein
256



EINSTEIN MAGAZINE No.83

published for users of Einstein (and other) computers
by Steam Computer Society. Chief Editor and Publisher:-
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(opinions herein are not necessarily those of the publisher)

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SHOWS AND EVENTS DIARY

british printing society events:- Solent Print Fair at Four
Marks Village Hall, near Alton
10am - 4pm Sat 6th September
Cornwall & Devon branch Open Day, Yelverton, 20 September
York & District Printmeet, New Earswick, York, 27 September

STAFFORD SHOW:- 8TH November. See page 24 for entry coupon

TO GO:- Member Graham Johnson has a Spectrum +3 computer
with 3" disk drive, joystick, manuals, software, etc., that
is looking for a new home. Free if you collect/pay postage.

Anyone interested? Then contact Graham at 37 Regent St,
Bedworth, Nuneaton, Warwicks.CV12 9BN, or phone 01203-319710

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CHIEF EDITOR, COOK & BOTTLEWASHER'S COLUMN

The user group continues to fill a central role in the loose network of moribund and defunct special interest groups kept alive by your Chief Editor, much along the lines of the much lamented late Light Railways entrepreneur Colonel Stephens.

To anyone familiar with "The Colonel" it will come as no surprise at all that the Einstein User Group ceased to be a viable proposition many years ago, and that with no cash at all in the kitty, and subscription renewals failing to cover the postage cost on the magazine, paper to print it on has to be scrounged from a waste paper merchant, its envelopes are recycled from incoming mail, and it is printed on a "You scratch my back and I'll scratch yours" basis with a local church, who have printing facilities but no printer. This explains many of the idiosyncrasies -- but not why someone who has no interest in the Einstein goes to such lengths to sustain it & give it a fighting chance in the 21st century!

This being the situation, subscription renewals are of vital importance, and the magazine's content is all-important. A succession of new apprentice editors has resulted in total chaos in the production line instead of the usual near-chaos (blame it on an impossible workload on my shoulders), and while we have a fair amount of rather technical material for a few issues ahead, we have almost nothing for novice users and for "I don't really understand computers & what's in the magazine is far too technical and difficult for me" users.

We need short, simple BASIC listings, preferably with simple instructions on how to turn them into programs that novices can run and some explanation of what they are doing. We also need to renew the exchange of ideas, hints, suggestions and "This is what I have and how I use it" mini-articles. We also need descriptions/reviews/simple user instructions on software (of all sorts), magazine back numbers, and Einstein books/manuals/hardware. That's in addition to further technical and upgrade information.

The Einstein is now long in the tooth, and its antique 3" disks, 40-column display, etc., are a threat to its survival. We have members actively upgrading their Einsteins to modern standards and sharing the details with us in the magazine. We're experimenting with the idea of forming a loose-knit active development group with a newsletter (copy enclosed) to share ideas, etc, within this group of members.

If you are interested in games -- or anything else! -- share it with us. On disk with a hard copy makes life easy for us.

The Bletchley Park Trust Ltd
Britain's Best Kept Secret

Entry Ticket
Admit
One

Ticket
No.



005431

Bletchley Park, Wilton Avenue, Bletchley
Entrance Fee* Adult £3.00

*The Bletchley Park Trust Ltd. Reserves the Right of Admission

BRITAIN'S BEST KEPT SECRET -- BY STEPHEN POTTS

Here we are, summer is already upon us and I still have not completed the article that I started last spring. Well I had better get on with it, or it will be winter again and the point of the article will be lost for another year.

In the summer months computer interest usually wanes in favour of more out of doors activities, but come the dark nights the screens glow brighter. Here is a chance to do a power of good, and have a really good time. You can involve all the family too. You can take a picnic and help the fledgeling national computer museum get off the ground.

Note this is only in its infancy, so some allowances have to be made in comparison with the more lavish media grabbing exhibitions, but don't get the wrong idea, there's lots to see & do. I could have spent longer than the full day I had.

The place I refer to is BLETCHLEY PARK TRUST. This is two miles south of Milton Keynes, but that won't help you find it. I drove past the entrance several times, and could not believe it when I did find it. The best way to get there is bus or train, as there is a path to the site opposite the station. If you come by car find Bletchley town, then you want Bletchley Park. The locals are none too much help. It is TOP SECRET, remember!

Travel south down Sherwood Road to Buckingham Road, turn right past THE GEORGE, turn right again before the EIGHT BELLS, turn right again into Wilton Ave. Be careful, it looks like someone's driveway. If you reach the church on Rickly Lane, you have gone too far. The distances I am talking about are very small, just a few hundred yards on each road.

On entering the driveway you pass along until you reach a guard post. This is how you know you are in the right place.

Then there, spreading out before you, lies the Victorian mansion house and park land that was commandeered during the war, destined to become hallowed ground not only to computer hobbyists but all the free world, especially we British. For here is where the plans of such as Montgomery, Churchill, Lee Mallory and Harris were formed, using the inside information on German movements from the teams of code breakers using the first electronic computer under Alan Turing.

This was

COLOSSUS

Following a lecture in Whittle Hall at RAF Cranwell (near where I live) I was given a pamphlet handed out by Tony Sale who has dedicated his efforts to rebuilding the Colossus computer. This is necessary as the originals and the plans were dismantled and disposed of on government orders. The pamphlet jerked my memory, and several bits of documentaries and books formed together for the first time. There is even a JAMES BOND element to all this, as the machine in "FROM RUSSIA WITH LOVE" is a Lechter, and this (along with the ENIGMA machines) form part of the display at the Bletchley Park CRYPTOLOGY TRAIL.

Back to my trip though... The area is in a certain amount of disarray, British Telecom having used the site as a training ground for many years. Some large modern (at present disused) accommodation blocks adorn the parking areas.

Walking from the parking area those of you who like historic and military vehicles would be advised to detour around the motor pool. This has a good display of vehicles in motion as well as on display and under going refitting.

Walking on uphill, and bearing right to the main mansion, the first port of call is "HUT 4". This is the bar and refreshments area, all in the 40's style. There is supposed to be a film in operation from time to time, but this was not the case on the day I went.

The Victorian mansion is next. There is a regular guided tour from here, but as this doesn't cover the whole site I recommend you look over the mansion. This is where the top brains of Britain were concentrated. The original projectors are still in place, as used to view the latest aerial reconnaissance.

The cinema used for briefing and the splendid library used for contemplation are nice, and across the hall are the set of rooms made over to the Churchill collection. There is a mass of mementoes of the great man: busts, paintings and his writings as well as popular cartoon images from his whole life, and not only the war years. This alone will be well worth the pilgrimage to some minds.

Step out of the door, bear sharp left, and left again. This takes you round the side and the back of the mansion to a display of veteran fire engines. In the stables there is a magnificent display by the boat club.

The bridge of a ship is built into a corner, so you can don the captain's hat if you like. Models of the Bismark and Graf Spee are super, along with many others, including submarines. Several of these are used on the lake in front of the picnic area on special event days.

Opposite the stables is the NAAFI, open for lunches etc., also there is the toy museum, with lots of wartime exhibits and lots of postcards poking fun at the Germans.

At this point I would suggest that you latch on to a guide. These are not professionals but people who have a commitment to the park. If you do a little research first you will get a lot out of the walk and talk. We walk along to the bomb proof rooms where the initial decoding was done by the ticking Bombe sorting out the codes into a sequence called a menu.

In passing I should mention that in one of these is the home of the model railway club, with a couple of interesting layouts. Along the way we pass the punched card houses that had to be built to hold all the documents. The next place of interest is next to the traffic island. Just an area of rolling lawn, with only a door step to show, yet this is the place. Yes, the first ever computer room!!! Well, you will have to use your imagination to step back in time a little.

We walk across the lawn to a more modern building called Falkner house. This is where your guide will leave you to wander the lengths of corridors, each door off containing the various special interest groups, well marked and often with helpers in attendance. This is the most interesting area to me, allowing you to wander at your own pace.

The first area is the collection of veteran cinema projectors and the associated history. There is also the aircraft recovery group for the area, with a fine display.

One door I passed I had to take a second look, wipe my eyes, and look again. Yes, it is a complete German command post, with live actors and in radio contact with the German High Command! Next we come to the home front, with lots of memory if not tear jerking exhibits. Lots of the organised parties of old comrades in arms had wry smiles on their faces at what were once every day objects to these people. Time for another cup of Rosie Lee, served by a sprightly Wren in full uniform, seamed stockings and all.

Then on to the room dedicated to life in the park for the people billeted locally. The diplomatic radio section was interesting, and the early radar there was the frosted glass chart for plotting positions, not the picture of girls around a table pushing wooden markers as seen in countless films.

There is a large room the size of a village hall, with all forms of computer, large and small. Luck was on my team as I had Barry with me, who used to program wire cores with graphite rods for I and O s. He took delight in seeing what was top secret at one time, open to view and explanation.

Unfortunately this section is in need of some work, as it is more a collection rather than an exhibition. What a pity I live four hours drive away -- or is that a good job for all concerned???

As you enter the CRYPTOLOGY TRAIL there is a section on the ENIGMA and LECHTER cypher machines. These encode the letters of a word by several spinning discs that rotate in a set order, given in the code book and changed daily. This is the type of machine James Bond acquired for the secret service in the film "From Russia With Love", set against the back drop of Budapest. In fact the real truth is stranger than any Ian Fleming story line. Yes, we had one delivered to the Embassy the week war was declared!

Now we move to the Cryptology Trail. This section has lots of show windows depicting the various stages in a signals life. Dispatch riders bring in the intercepted messages from the relay stations, and they are sorted, codes cracked, and translated into English. Then out by courier to top people like Monty and Churchill etc. These signals were so secret that the recipient had to read & hand them back, so they could be returned to Bletchley for logging and storage.

We pass along to the point I was most interested in -- the Colossus rebuild.

This intrigued but slightly disappointed me; perhaps my expectations were too high.

The Colossus was not what I had expected. it was behind glass screens, surrounded by papers, and boxes of valves. The reasons are obvious if we consider that it's still being worked on, as it involves huge voltages, hot valves and paper tapes spinning around an open frame, so for safety it needs to be guarded off. I suppose also the masterminds working on the rebuild would be interrupted and distracted from their mission if were to get too close or inquisitive.

From here we exit through the gift shop, where there is a good selection of books, gifts and cards available. The history of Bletchley Park is available, also autobiography of top people such as Alan Turing, who went on to Manchester University before being eliminated as a risk to security. I recommend both these books.

So there you have it. A beautiful place hidden away in the centre of the country, with a glorious history, and hallowed ground as far as computing is concerned. I thoroughly recommend it.

The Park is a trust I would like to leave you with the words of the trust itself..

TO SECURE FOR THE NATION THE AREA KNOWN AS BLETCHLEY PARK IN RECOGNITION OF THE WORK OF THE INTELLIGENCE SERVICES ON THE SITE, IN PARTICULAR THE CRACKING OF ENEMY CODES.

TO DEVELOP ON THE SITE MUSEUMS OF CRYPTOLOGY AND THE HISTORY OF COMPUTING, AS BLETCHLEY PARK WAS THE HOME OF THE WORLDS FIRST ELECTRONIC COMPUTER AND IS RECOGNISED AS THE BIRTH PLACE OF THE COMPUTER INDUSTRY.

If you cannot get into GCHQ, then take the family and enjoy yourselves in a full and informative day out at Bletchley Park instead. You could do a little reading on the subject to get the full benefit of the park, or do it at leisure afterwards if you spend your pennies in the book shop. For a brochure containing details of open days and special events do send a stamped self addressed envelope to

Enquiries Dept, The Mansion, Bletchley Park Trust,
Wilton Ave, Bletchley, Milton Keynes. MK3 6EF

WANTED DESPERATELY by Steve:- Colour monitor for a TC-01, also AMTELL full set, as his copy is missing the files AMTEL.COM and AMRUN.COM. Contact Steve on 01400-261839

MEMORIES FROM THE LONG-GONE BOURNEMOUTH & DISTRICT EUG:-

Hello Ron, Many thanks for the first issue of the BDEUG disk newsletter, and congratulations on a fine effort. Can I be so bold as to raise a couple of points?

1. I want to archive onto 5 1/4" DSDD (they are cheaper!).
2. I would prefer the magazine to be 80 column based. This is only a personal preference because my 80 col monitor sits atop the computer, and the colour (40 col) to one side.

Once again many thanks for an excellent production, and I look forward to the next issue.

With very best wishes, Colin Coker, South Western EUG

ED 1. Archiving onto your 5 1/4 can be done using NSWEEP (sometimes this is on disk as NSWP or NS).

2. If there is anyone out there who has a working 80/40 column disk magazine program then please send it in, or at least let us know about it.

Dear Ed, Has anyone had the keys sticking down so printing a line of EEEE or LLLL? If so, Help!

I also bought from a "FRIEND" Turbo Pascal with no documentation so I can't use it. Can anyone HELP???

Any info on DATASTAR would be a great help.

Gary Williams

ED 1. We answered this in magazine no 2.

2. Come on you Pascal programmers help out Gary with his problem and at the same time write us a article on Pascal for the beginner.

3. What sort of info do you want on Datastar. Gary??.

Hints and Tips

1. If you wish to return to basic from DOS, using the GO instruction will wipe any BASIC program that is in memory. To prevent this loss, go into MOS and type Y <E>.
2. When in XBAS only the first set of quotes are needed when loading in a program.

MEMORIES FROM THE LONG-GONE BOURNEMOUTH & DISTRICT EUG:-

REVIEW

Einstein Assembly Language Course written by Dr. Mike Bayliss with software by Graham Rounce and published by Glentop. Comes complete with 150 page book and software.

The book is very well written and starts at the beginner level of assembly language.

It works slowly and steadily, taking each instruction and explaining its use and what effect it has.

There are exercises to be done (answers at the back of the book). These help you understand to what you have just read.

The software is very useful because you can test the instructions and actually see what is happening to the registers in the processor as you use the instruction. This is also useful for understanding Binary, Binary-Coded Decimal and Hexadecimal.

An Assembler and Disassembler is also included and the book uses this to teach you how to write assembler language and how to use the Assembler.

Conclusion

BRILLIANT! Yes, good bedtime reading, this book. A few mistakes in it, but I feel this is useful, so long as you are aware that they are there, as it teaches you to find out what has gone wrong when the results are not what you expected.

COMPETITION

Les Stanley, Member No. 406

Dear EUG,

On working on the competition in AMN 1/3 (sent in by Trevor Clarke) a number puzzle developed which may be of use for a competition. [[CH.ED. OK then, here it is!]]

USING ALL TEN DIGITS 0-9 IN DECIMAL BASE TEN:-

HOW MANY FIVE DIGIT NUMBERS DIVIDED BY A SINGLE DIGIT GIVE A FOUR DIGIT RESULT. ALL TEN DIGITS IN EQUATION APPEAR ONLY ONCE. e.g. 17082/3=5694 . INTEGERS ONLY .

INTRODUCTION TO MACHINE CODE (Part 1)

by Dave Salvage (with additions by the Chief Editor)

Since I originally submitted the first two articles in the series "An Introduction to Machine Code Graphics" to them for publication in EINSTEIN MAGAZINE, the editors (past and present) have suggested that I write a basic introduction to machine code (MC) programming first, for those who have no previous experience of MC. This has been done before, but there are many new members to the group - welcome to you - and it is a long time since any such article(s). Please bear with any repetitions in the machine code graphics articles when they appear, but I do not have time to rewrite them.

Besides, some repetition can be helpful, so here goes.

Rule 1. DON'T PANIC !!!

Machine code programming is totally logical (as are computers) and it allows far greater control of Albert's functions than BASIC or any other high-level language.

The first concept you need is that of REGISTERS. These are rather like pigeon holes within the Z80 microprocessor chip, which forms Albert's Central Processing Unit (CPU).

They are called A, B, C, D, E, F, H, L, IX, IY, PC and SP.

Rule 2. I TOLD YOU NOT TO PANIC !!!

Register A is the ACCUMULATOR, and this is the default register into which results of computations are stored. Like the other single letter registers, it can contain only 8 bits = 1 byte.

Rule 3. You have a lot more intelligence than any computer, so calm down & don't let it get the better of you.

If the terms bit, byte and default are new to you, it is easiest to think of a bit as Albert's equivalent of a letter or number in his own language (machine code), and a byte as the equivalent of a word. The idea of 'default' is a bit like a car going in a straight line when you take your hands off the steering wheel on a straight and level road. The default drive or directory is the one you are logged into & that the operating system automatically looks in to carry out a command, unless you tell it to look somewhere else.

Register B can be used in conjunction with specific Z80 instructions as a decrementing counter from a maximum of 255

(although 256 is possible by starting the countdown at 0 (zero)).

Decrementing is the opposite of incrementing, in the sense of decreasing by one each time, as opposed to increasing.

Register F is the FLAG register. More about that later.

Although the registers can only hold 8 bits (= 1 byte) each, they can also be paired to contain 16 bits, and allow memory addresses to be used. When this is done, the pairs are BC, DE, and HL. The accumulator and flag registers are also paired for some functions.

The IX and IY registers can only be used as 16-bit registers and one of their uses is to provide INDEXED addressing. That is they can sequentially contain consecutive addresses in a block of memory by simply specifying the start address and the number of addresses. If you have difficulty in grasping the idea of this, think of it in terms of keeping track of all the house numbers in your street by remembering the first and the last one, assuming that your street numbering is straightforward and without peculiarities or anomalies.

Advanced MC programming can access the I register alone for specific functions, but don't worry about that for now.

The PC and SP registers are special 16-bit registers. The Program Counter (PC) holds the address of the next MC instruction after the one being executed, and the Stack Pointer (SP) holds the address of the top of the STACK.

The stack is like a pile of plates (or anything). Plates can only be added to and taken from the top of the pile. In Albert's MC, the plates are the contents of register pairs which are PUSHed onto the stack or POPped off the stack.

For example, PUSH AF will place the contents of the accumulator and the flag register onto the stack. This is often done to preserve the values in the registers while they are used to do something else. When that something else has been done, POP AF will reload the accumulator and flag register with the values they held originally, provided those values have remained or regained the top of the stack.

Remember, the stack works on a LAST IN, FIRST OUT (LIFO) principle, just like the stack of plates.

Well done if you have made it so far. You have already done the most difficult bit of learning how to do Machine Code (MC) programming, which is to grasp how it is used.

The rest of the arcane mystery of machine code programming is not a lot more difficult than learning how to write a 4-page letter or check your telephone bill, but it is mostly done using ASSEMBLY LANGUAGE, as this is considerably more intelligible to us humans than hexadecimal numbers. Assembly language uses mnemonics to represent hexadecimal number instructions, which (in their binary form) are what actually tell Albert what to do. PUSH and POP are such mnemonics.

Hexadecimal numbers are in base 16 rather than base 10 (decimal) and go from 0 to 9 and A to F.

This is equivalent to counting from one to sixteen (in decimal terms) before you carry the one and start again at eleven. If this idea is hard to grasp, because we don't have names for the extra numbers that this involves, imagine that you use your fingers for counting, and that you have seven fingers and a thumb on each hand, instead of however many you usually have -- most people have four fingers and a thumb, but this is by no means universal!

Each hexadecimal number can represent four bits of binary data (a nybble). A nybble is half a byte (!), so two nybbles (i.e. two hexadecimal numbers) are required to represent a byte of data. For example:

Binary	0	1	0	0	1	1	1	0	
Decimal	128	64	32	16	8	4	2	1	= 64+8+4+2 = 78
Hexadecimal	8	4	2	1	8	4	2	1	= 4 & 8+4+2 = 4E

If you go into MOS on Albert you will encounter hexadecimal numbers, and sometimes we include MOS listings in the magazine, which you can key directly into MOS, and then save straight to disk as a binary file, without having to use assembly language or having to use an assembler program.

To start using the registers, they must first be loaded with data. The simplest example is LD A,78 which loads the decimal value 78 into the accumulator. The same would be achieved by LD A,&4E where "&" tells Albert that the value is in hexadecimal format. A similar format can be used for all the other registers when they are used singly.

For register pairs, four hexadecimal numbers are required, or up to 65535 decimal. For example LD BC,&E01D. When memory addresses are loaded into register pairs, I personally find it much easier to work with hexadecimal notation.

The maximum 65535 decimal (&FFFF) is equivalent to 64K - Albert's random access memory capacity - so every address in

Albert's RAM memory can be accessed by a register pair.

These examples are of IMMEDIATE addressing, where data is loaded DIRECTLY into a register (pair).

Another form of addressing is DIRECT, when the contents of one register are loaded into another. For example LD A,B loads the contents of register B into the accumulator.

INDIRECT addressing is when the CONTENTS of an ADDRESS IN MEMORY are loaded into a register. For example LD A,&E01D loads the contents of memory location &E01D into the accumulator.

EXTENDED INDIRECT addressing is when the MEMORY LOCATION is itself held in a register pair. For example,

```
LD BC,&E01D
LD A,(BC)
```

would load the contents of memory location &E01D into the accumulator.

So much for loading the registers. Now what?

The accumulator can only be ADDED or SUBtracted with other registers or immediate data, the result being stored in the accumulator. For example ADD A,8 adds decimal 8 to the contents of the accumulator. ADD A,D adds the contents of register D to the accumulator. ADD A,(HL) adds the contents of the address held in the HL register pair to the accumulator.

The subtract commands do not require the accumulator to be specified so would appear as SUB 8; SUB D; SUB (HL) respectively.

Now the Z80 processor has extra 16-bit instructions which allow the HL, IX and IY register pairs to be added to other register pairs with the result stored in the first register pair in the instruction. For example ADD HL,BC; ADD IX,IX. A particularly useful one is ADD HL,HL which effectively multiplies the contents of the HL register pair by two. The special indexed registers (IX and IY) do not have the same appeal for this use, but can be used.

Finally for this article, the add and subtract commands can incorporate the value of the CARRY FLAG into the addition or subtraction. More about flags next time, but the commands are similar, using ADC instead of ADD and SBC instead of SUB.

STAFFORD SPRING ALL MICRO SHOW 97 REPORT, BY STEPHEN POTTS

I would like to say "Hello!" to those of you who made the effort to come and see the show. It was slightly quieter than in the past, but still drew in over 2,000 people.

Perhaps I should put in a plug for the NOVEMBER AMS show at this point instead of at the end. The show is held at Stafford Showground, which is on the main A518 between Stafford and Uttoxeter. If you come by car it is well signposted off the M6 at junction 14, and if you get a lift into Stafford town -- or better still come on the train -- there is a special shuttle bus from the railway station.

As for catering, there is a large restaurant upstairs serving proper meals as well as the usual snacks and drinks.

I have stood the shows for a few years now and have a sorted routine. This involves taking two days off work. Fridays I clear out the car and load up with all the essentials. Coffee, milk, sugar, kettle, -- DON'T FORGET THE CUPS THIS YEAR! -- Oh, and the EINSTEIN stuff must go too.

Saturday is a very early rise (to be ready for my friend John to arrive), and then we are off. John doesn't have an EINSTEIN at all, but is the only one whose arm I can twist [get to volunteer]. On the journey we chat about disks, monitors ins and outs, until we arrive at the showground.

As usual, terrific organisation. We receive a welcome from RAY GAMBLE, a permit, and a map of the stalls showing our allocation. We can drive in right up to the stall to unload.

One difficulty I have is deciding what to show or what people would like to see. I have the master disk demo running automatically. This shows a good representation of the capabilities of the EINSTEIN and good use of colour and sound [You need a PC386 to match it]. On the mono 80 column machine I show text adventure games, [interactive books if you like] and I carry my software collection with me so if someone wants to try something that they may like they can [i.e. chucky egg].

I also carry the EDI disk magazine and you can have a copy of this with pleasure. Just bring a formatted disk with you (each issue takes up one disk side).

During the day we said hello to GRAHAM BETTANY and MIKE SMALLMAN who carried the EINSTEIN flag so well in the past [see the back issues available from Tony].

Former stand-in Einstein magazine editor Milton Finesilver dropped by and said hello, as also did two young chaps who apparently work for Dr Clark, who was one of the big brains behind the TC01. Another visitor was Dave Salvage. We talked on a few topics including my drive articles in issue 80. It sounds as though he may be able to start off a few projects, so watch this space!!!

If we can socialise with other members, develop new ideas and use the stand as a meeting place for co-operation, constructive (not destructive!) criticism and sharing our mutual enthusiasm it will be worth the effort.

Do find yourself a project and develop it -- but don't keep it a secret! Do let others know what you are planning, and share ideas. What you think is commonplace may be just the info or the idea that someone else is really looking for.

I personally would like to see a distribution map to try to encourage the sense of belonging by holding localised social evenings. In the meantime do use the AMS stand as your focal point.

The AMSTRAD club I belong to held annual conventions with stalls, demos tutorials and even techies on hand, the ATARI clubs do use the AMS as their focal point.

I have had some success in obtaining 3" drive belts and although these were my own personal ones I let them go at the show to help others.

So I thought "Why not do a service to our members?" and to that end I have been in touch with a man who is producing 3.5" floppy disk drive units called a FREDDY DRIVE. This is a disk drive unit ready built with its own power supply and switches, cables, etc., to plug in & go without any hassle.

Unfortunately my efforts to get one for the stand came to nought -- not even any publicity flyers came in time.

Whilst on drives, on the stand I did talk to several people about the subject but I don't think it translated too well.

I have modified my own EINSTEIN to use 3.5 drives, and there can be various configurations using switches or software..

I have a side switch for side [a] or side [b]. There can also be an ABBA switch i.e. 3inch A/O drive with 3.5 B/1 drive or when switched 3.5 A/O drive and 3inch B/1 drive.

In addition to this you may have software to allow larger capacity than the original EINSTEIN XtalDos version 1.xx disk format of 180k 40t s/s. Next best is the old PC 360k double-sided equivalent on 5.25" disks (or the 80-track "Quad density" version that was developed for the BBC computer). These work fine if you happen to have one or are offered one cheap. Disks for these are still not too hard to come by but do before of old tired ones that are shedding the surface coating. These are death to disk drives!

Best of all is the 3.5" 720k 80 track d/s disk type. Before you reach for the pen I know this is not the exact no of k, but I am referring to standard types, though the number of sectors per track cause variations about the mean size. If you manage to pick up a good used 3.5" 720k (double density) drive you should have few problems following the "How to..." articles we've already published in the magazine.

[[CHIEF ED: Dual-mode 1.44Mb 3.5" drives are now becoming more common as cheap ex-equipment drives. Some have a sensor to detect whether you have inserted a 720Kb (double density) or a 1.44Mb (high density) disk and select the correct mode, but some do not. Steve says you'll need to use his side-select-switch method to strap these disks to 720Kb mode, but we've also asked Steve and his super-boffin chums in the group to check out whether it's possible to use the now more common 1.44Mb disks too. Ted Cawkwell's had a go to see, but the results are totally contradictory, raising the query as to whether DD disks can be used as HD but not vice versa, with some disk merchants taking advantage of this to put DD media inside both sorts! More on this as results come in.]]

We can't simply run these 1.44Mb drives and their disks in that mode on the Einstein "as is", as Einey's FDC675 (floppy disk controller) chip can only handle 720k. It cannot handle the 1.44 rate of operation or control signals. [[CH ED: Is there a replacement FDC chip that could readily be fitted to Einey, that could handle the 1.44Mb data rate, if the drive mode can be switched by a "mode select" switch?]]

[[CH.ED. Steve says he hopes this is all clear, as it took him 4 years and a lot of trial and error purchases to find out. What is clear is that we need to know a lot more from our technical chaps like Steve and Duncan (and quite a few others behind the scenes) about what's compatible with what and what isn't, & how to overcome the incompatibilities.]]

I will soon write an article on changing 3 inch drive belts as this seems to affect quite a few people.

I'm also considering buying some stock for the stall, i.e. 3 inch discs..... 3 inch drive belts..... printer cables ... monitor switch boxes ...monitor cables... Do drop me a line with any suggestions, but please remember that I have to finance it out of my own pocket.

Well the show all seemed to go well and quickly. One man came to thank me for his drive belt, and to tell me his 256 is now working. Much appreciated Stan. It's nice to get a "Thank you" from a satisfied customer.

Please don't be too critical of anyone in the user group who is doing their best. We are all simply volunteers, just like you, not all-seeing or all-knowing magicians. Far from it in fact, we're just trying to help each other out, not running a business.

If you have any EINSTEIN stuff for the stall do drop me a line as there are lots of things I would like to show, but at present all the display is my own kit. I could do with a colour monitor, as mine is still not working on blue, so the colour is funny.

I would like a Speculator and a 256k Silicon Disk expansion.

If you have any redundant disks we could recycle on the stall do give me a call, also any software or manuals to pass on.

If you prefer to sell items send me a price list along with an SAE plus a spare stamp. I had three enquiries about purchasing an EINSTEIN.

As the show wound on, heading for the close at 4pm, we started to switch off to allow things to cool down. The last half hour seems long as we prepared for another loading-up stint. Two days of work and we head for home saying our goodbyes to the organisers and assuring them of our best efforts in November.

Well that's my bank holiday gone on typing, so I hope to see some of you at the AMS in November,

Any enquiries, sales, donations of equipment or volunteers do drop me a line at

Einstein Stall, 85 Thorold Ave, Cranwell Village,
Lincolnshire. NG34 8DS

AND WHAT'S WRONG WITH BASIC? by John Marriott

Back in the Autumn of 1985 I decided to get to grips with Machine Coding. Not that I had any real need to, it was just that I wanted something useful to do whilst waiting in my car for my son to have his guitar music lesson...

...sitting in a Metro in a private road, with a feather quilt round me, trying to stave off creeping cold paralysis in the glimmer of the interior lamp and a rather prompt visit from the "Boys in Blue" - yes, and I think the Machine Code book was written in Serbo-Croat...

...led to my son receiving some rather sympathetic looks at school because of his strange father - me! And of course, the computer I then had was a Spectrum 48K, for the simple reason that I couldn't afford the £400.00p. that an Einstein cost in those days AND the cost of the programs ... ouch!

So, whilst the following is more Spectrum orientated, because it shares the Z80 chip a lot of what follows holds true for a fair amount of Z80 chipped machines, and most computers I guess.

One of the main drawbacks with the BASIC Programming Language is that it has to be Interpreted by its host computer before it can use/action the Commands it comes across as it runs the program - rather like translating something into French, then into German and then into Latin. Rather time consuming and very often what was originally meant lost something in the translation! The other main thing is that the host computer does this EVERY TIME it runs through the BASIC program - it doesn't have that "peculiar memory re-call" of the human brain which says "...hey, I've just done that, the Syntax of the Command was OK and the values were valid, so I can action it without checking, which means I can save time...".

Well, one of the "go faster" tricks in Spectrum programming is to put all the "set up" procedures at the END of the program with any "often used" right at the start, then SAVE off the program with SAVE<program>LINE<setup><enter> - the next time the program is loaded it'll automatically run from LINE<setup>...

e.g.

```
10 CLS: PRINT AT 5,1 0;"Press any Key": PAUSE 0
```

```
20
```

```
//
```

```
9000 CLS: DIM a$(9,9): REM setup entry to program
```

```
//
```

```
9999 FOR x=0 TO 10: FOR y=10 TO 5 STEP -1: GOTO 10
```

This also had the added benefit that should an accidental BREAK occur, then the GOTO 10<enter> Command preserved all the VARIABLES (RUN<enter> didn't!).

One of the things that I appreciated with the Spectrum 48K was that you KNEW where things were in memory! Strange things happened in the Sinclair ZX81 and the Commodore VIC-20 (especially to screen memory!) when extra RAM cartridges were added AND as there were no ROM BANK switching problems to worry about, THEN, certain program protocols could be happily ignored - but NOT SO on the Einstein!

One of the things I learnt was to try and reduce the number of lines used by cramming as many Commands as possible into a line, but often falling foul of IF...THEN and IF...AND...THEN Commands, which seemed quite logical to me but NOT to the BASIC Interpreter! If you think that the original CRYSTAL BASIC was bugged/lacking then try the SPECTRUM version ... even up to the last +3!

Anyway, having typed in many a program from a computer magazine, spent ages debugging my typing mistakes AND 2 months later looking up further bugs in the magazine's ERRATA column, then finding on running the program that watching paint dry was more exciting - I tried writing a few of my own games/screens, I still found that SPEED (or lack of it!) was the greatest drawback. At that time some adverts and reviews started extolling COMPILERS and how THEY could make your BASIC programs run "...up to 40 times FASTER!..." - which of course they never did, as they were so limited and bug-ridden! I never met one which could handle the DIMension Command, which is just about the most important tool in just about any BASIC program!

You also had the added problem of the "overheads" of the portion of the "run time" compiler which had to be loaded with the "compiled" BASIC program, AND with a lot of my programs I found that this "run time" section of the compiler was longer than my original BASIC program, which could increase the tape loading time from 1 to 3 minutes, AND I found that very often the "speed" gain was only about 4-6 times BUT the CRASHES were up by 1000%

By chance I came across the COMPLETE SPECTRUM ROM DIS-ASSEMBLY by Dr Ian Logan, as well as the Z80 ASSEMBLY LANGUAGE PROGRAMMING by Leventhal (YUK to ZAKS!), and 8080/Z80 ASSEMBLY LANGUAGE by Alan Miller, as well as a

scientific calculator which had the DEC/HEX/BIN function - then some even greater luck, a whole stack of octal graph paper (ex-Governmental stationery cupboard!) and the CODE MACHINE by Picturesque, being a machine code monitor/dis-assembler which made ZEUS and DEVPAK look awkward and difficult!

As by now I'd also moved on to a Spectrum+3 with its 3" drive and a MULTIFACE+3 freeze/copier, moving through computer memory and hacking other people's programs led to some surprising discoveries, especially about COPYRIGHT SCREAMERS - who seemed to have a fair amount of other Programmers' material within theirs - names, dates, and all!

So, I thought I'd "look" at some of these COMPILERS - why they ran the way they did, the "over heads" problems & etc. It quickly became clear that one of the main problems was that the so-called Spectrum Compilers had not been specially written for the Spectrum BUT had been adapted, AND that a lot of the OPERATING CODE was simply duplicating the Spectrum Operating Codes - BUT badly! Let's be honest, back 10 years ago just about ANY program could be sold on hype alone (seems as though not much changes!) and if things got "Customer difficult", well - a merge with another Software House or a "Ceased Trading" solved all!

As a 5K Machine Code Program can easily take 3 months to develop/de-bug when written from scratch full time, or 12 months part-time to an "it works" level, I didn't feel that trying to get to grips with a Compiler/BASIC program would be useful - the main problem is that the initial BASIC program YOU are writing HAS to be thought in the limitations of the Compiler...

...which is the same problem if YOU intend to take your BASIC program and turn it into a FULL machine code/stand-alone program - WHAT'S a STAND-ALONE machine code program! Simply - when the Spectrum had a 16K machine which gave program limitations, they'd load a short BASIC program, e.g. LOAD "" CODE<enter> which would load a program right from &4000/16384 the start of the DISPLAY FILE (or Screen Memory!), across the DISPLAY FILE ATTRIBUTES (Screen Colour!), then across the SYSTEM VARIABLES/CHANNEL INFORMATION and right through BASIC PROGRAM and UDG areas to PRAMPT (end of RAM!) which meant that the moment the END OF FILE info came up from tape loading the program ran! Now, when you "peeked" into the program with the MULTIFACE+3 the program actually contained a BASIC program!

No great secret - obviously ALL the VARIABLES had been

contained with "what line and section of the line/goto/gosub jumps & etc.", just a more sophisticated version of my earlier SAVE<filename>LINE<number><enter> example. Looking at these earlier Spectrum programming examples showed me that a fair amount of "mixed running" had been used - Machine Code where SPEED was required and BASIC where "awkward" or "what key?" commands were needed...

...I then dis-assembled the CODE MACHINE program (yes, it was protected - but that was part of the fun!) and saw how a specifically-for-Spectrum machine code program should be written. It was funny how it reminded me of the BBC PROCEDURAL LANGUAGE Protocol, and when you think of it, there is nothing to stop you having little blocks of machine code program doing a specific job, with CALL<keypress?>

By now, I'd thrown away (well, ISCA CLUB had sold them and pocketed the money!) all my "...How to Learn/get Puzzled/misguided Information/I think its..." books on Machine Code and so I started pinching bits of other Programmers' coding - just as they'd done when they started, and tried "changing" some programs to a hybrid BASIC/Code - AND to my amazement, found they worked!

No Compiler "run time" overheads BUT complete "stand alone" programs! Started developing a Disk Reader for my +3 which became a monster when I tried to create an AUTO-BOOT disk file which happily transferred itself to my other disks ... AND locked me out of my computer with the screen in a "no line/frame sync" frenzy - my first taste of a computer VIRUS - self inflicted!

And that's it for this month!

ALBERT'S HALF BROTHER By A Dunipace

The Einstein has common components with more machines than you may think. Whenever I see an article in one of the gaming magazines that refers to the old Commodore 64's revolutionary sprites, I just have to laugh. Apparently every journalist believes that Commodore was the first computer to make use of the hardware sprite, and even invented the name.

There was a machine that came some years before the C-64 which used sprites. It offered 32 as opposed to the 64's 8 and even used a 16 bit processor. I am referring to the TI-99/4 & TI-99/4A.

The TI-99/4 was launched in 1979, 4 years before the C-64!

It used the same graphics chips as the Einstein and was a mixture of brilliant innovation and gross stupidity. The sound chip used was a device intended for commercial sound generators. It had 3 channels and a user controllable white noise generator. It could produce tones from 110Hz to an incredible 44733Hz! The only ones able to hear that high tend to have 4 legs and bark.

The CPU was the 16 bit 9900 built by Texas Instruments. Theoretically, it was fantastic. It should have outperformed the competition with ease. Unfortunately it only had an 8 bit data bus so the potential speed was slowed down to a crawl and it could only handle 48k of memory.

The built in basic was stuck in mode 0, which meant that you had to use 32x24 characters and could not access the sprites. There was no plot commands forcing you to use redefined characters to draw shapes. The final restriction was the icing on the cake. No poke or peek commands. You could not use machine code! BASIC was just that; BASIC.

Things were slightly improved with the EXTENDED BASIC cartridge. This upgraded the BASIC and gave you access to the sprites, but machine code access was unavailable unless you have the 32k memory card costing about #150. There were still no plot or unplot commands.

The one advantage it had over every other machine I have seen using the TI graphics chip was that it allowed the user to define an X & Y speed for each sprite and it would shoot around the screen until it was altered.

There was also sprite detection that allowed you to define an area of the screen or another sprite as a "hot spot" and if the sprite entered the hot spot the program would jump to a sub routine. This allowed for fast and compact games with smooth sprite handling.

This really is the other side of the coin from Albert. He does EVERYTHING in graphics mode. The sprite can seem to jump from spot to spot and the scrolling is certainly not smooth. It is, however, superior in every other way offering a disk as standard, 64k of RAM (compared to 16k), printer and serial ports, a user port, easy access to every single part of the hardware and software and lastly plenty of friendly people who still use it.

Without the TI's graphics chip, the Einstein would be a very different machine.

As a footnote, the TI was killed by its own quality. The cost of the components making up the machine was \$150, but the company was forced to sell it retail for \$79 to compete with the Commodore's and Atari's of the day. TI simply withdrew from the market, and started selling the chips to other computer manufacturers.

The rest, as they say, is history.

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LETTER FROM PETER OXTON

It's nice to see that someone read my letter in issue 68. In answer to John Briggs' comment about the relative speed(?) of WDPRO, I can only think that your handling of a given program is in direct proportion to your level of desperation to avoid administrative chaos if that program doesn't work! Being the only word processor we had, I think we developed a fair speed in using it, and I certainly found it simpler and quicker than Wordstar 3.3. Another minor advantage was in proof reading, since text appears in a different screen position during input from that shown under a screen "Print" display, giving you a better chance to spot typos. Each to their own, I suppose...

SALES/WANTS:-

Steve Potts (01400-261839) desperately needs a working colour monitor, and Chris Coxall (01322-346102) badly needs a working TC-01 or TC-01A. If either or both haven't already snapped it up, Mr Murphy (0115-987-3793) has a TC-01 to go.

JOYSTICK UPDATE:- Those GREENWELD Dragon/Tandy joystick interfaces mentioned in EM.82 are again in Greenweld's newsletter. Phone Greenweld at Southampton for details.

SORRY, we are out of space, so you'll have to wait for the next issue to learn about using DataStar in Pembrokeshire, and to read how Duncan Elvin has found a way for you to fit a hard disk drive to your Einstein -- plus a lot more that you never knew you didn't know. But if you hurry you can still get YOUR letter/article into print in the next issue!

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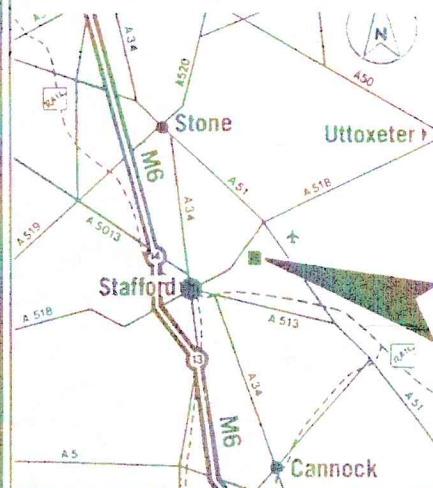


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with others."

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Einstein User Group is a vehicle for the mutual support and encouragement of Einstein users by sharing information, knowledge, queries and ideas between Einstein users for the benefit of Einstein users. Your input of information, opinion, views, opinion, question and feedback is essential to the continued publication of your EINSTEIN MAGAZINE.

Written/typewritten/computer input is welcome from all who have something to share with other Einstein users, or who seek information about the Einstein. Practical projects are specially welcome.

Preferred format for your input is ASCII file on Einstein, PC, CPC or PCW disk, plus a paper copy. Sketches, diagrams and/or clear photographs to illustrate your contribution are very welcome.

All Micro News (for all non-Einstein and non-PC computers/users) and MessyDos Journal (for MsDos and equivalents users) are published on an "as and when" basis, depending on input. Your regular or occasional contribution to these is welcomed too.

Einstein Diskmag No.3 is now available free if you send a 3" disk and return postage to New Romney, or direct from the publisher, Andrew Dunipace, at Burnhouse Cottage, Lennoxton, Glasgow, G65 7NH.