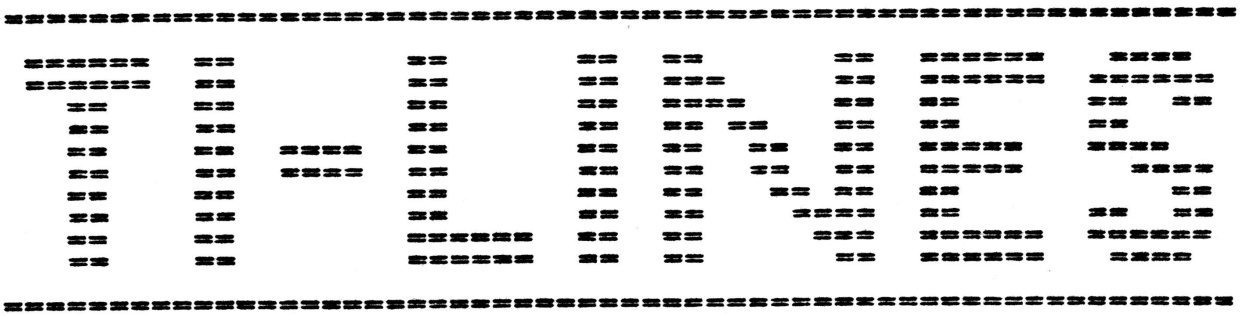

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Contributions should be submitted either on diskette in TI-Writer compatible files, or in a form which is as legible as possible. Art work should fit within an A4 area and should not contain colour. Very high contrast line drawings are preferred, and these may be produced by arrangement with the publisher.

OXON TI USERS 1985 Sole proprietor Peter G. Q. Brooks

I n d e x t o a r t i c l e s

HELP THE AGED : SEND THE EDITOR AN ARTICLE !!!

EDITORIAL

CART BEFORE THE HORSE

What marks this Editorial out as being unusual is the fact that I am writing it before the last issue has been printed, let alone published.

The reason for this is (fairly) simple. As I am so far behind, the February issue has been overlapped by the January issue, and unless I begin work on it now, THAT will overlap the March issue. I have enough material to be getting on with this issue even though I have not even finished writing part of the January issue, hence the daft title above.

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NEW MEMBERS

As a result of the Babble which I wrote for TI*MES, the newsletter of the TI-99/4A EXCHANGE User group, a number of people wrote requesting Associate subscriptions to OTIU and TI-LINES. To date we have no less than six new members. A warm welcome then to JOHN RICE, Mr V. COMLEY, FRED van der SCHAAR from Holland, Mr K. S. LARKIN, DAVID MILLER, SYDNEY MICHEL, BOB BOONE and the OTTAWA TI USER GROUP in ONTARIO, ALLEN BURT (whose article appeared in the last issue), JOHN ROE, DAVE HEWITT (not the Dave Hewitt who wrote the modulator article) and GRAHAM BALDWIN. I look forward to receiving a mountain of articles from you all...well, a small hill would do...

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HERE IS THE LATE NEWS : W. G. GRACE IS DEAD...

Funny how I often seem to come across information years after everyone else. As a result of taking on the TIHOME Software Collection late last year, I have come across a couple of TI documents (which I have had retyped in order to make them legible!) which detail errors and oddities in TI and Extended BASIC. Some of them I knew from the early days (i.e. 1980 for me), some I have seen aired recently in newsletters from over the sea. Many I have never even heard of, and so I have been trying to reproduce them on my machine. Surprise, surprise. Many of them are still around, and in at least one case can cause irreparable brain damage. You enter the right thing at the right time, and Zappo! Back to the title page you go. The brain damage ? That's caused by you trying to headbutt the TV through next door's living room wall...

I will air all of the documented errors over the coming issues of TI-LINES, and feel free to chuck in anything which you have found.

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CANADIAN CLUB

Returning from a rare visit to friends the other evening (it was a case of mixing business with pleasure as it happens) I received a call from a PETER ARPIN, who provided me with details of a Canadian TI User group.

It is called the OTTAWA TI-99/4 USER GROUP, and the contact is BOB BOONE (see above). Peter was apparently in London for a few days on business and had taken the opportunity to go chasing round the country with the help of BT trying to catch up with various members of the TI-owning fraternity.

I will be providing Bob and his members with a subscription to TI-LINES and TIHOME and OTTAWA TI USERS will exchange software (hopefully) once I get the catalogue sorted out. At the present rate of progress this will be in 1997. By that time Time Travel will have been perfected so I will be able to return to 1985, sheaves of paper clutched in my hot little hand (said paper having been procured from a Museum of Ancient Literary Materials) and present them to myself. I look forward to seeing me at my earliest convenience. (My earliest convenience was a little blue plastic potty...). Further episodes in this saga will be written from the comfort of a padded cell...a fat Amoeba...

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THE DATA PROTECTION ACT AND YOU

It's headless chicken time again. That is to say, someone has proposed an awkward piece of legislation, and everyone likely to be affected (and who is bothered by it) is running around trying to find out whether or not it applies to them.

During a spell of incipient insanity I became the representative for my hospital on the User Group of Oxford University's Data Centre at another local hospital. This simply means that four times a year I sit with a group of people who use the system much, much more than I do, and they talk urgently and knowledgeably about the system (and "cheapie micros like the BBC B with twin drives, etc., etc.") and then we all go home.

At the last meeting, the DATA PROTECTION ACT was raised by the chairman, who runs the Data Centre, and all he could tell us was that it was going to be very expensive for someone and he hoped that it would not be us!

I have heard this particular Act mentioned before, but always decried it on the grounds that the consumer has no right of access to the data which is stored concerning him/her.

However, although it doesn't really protect the consumer, what it DOES do is to threaten to put a tax on new technology (and some old as well).

If you have a database (a collection of records of any kind), and that database contains more than just a series of names and addresses - say your salary, or some medical information - then it MUST be registered with the DATA PROTECTION REGISTRAR at a cost of £60 PER DATABASE. It does not seem to matter whether the database is in the form of a tatty collection of handwritten cards or a super-duper hyper-protected disk file; each separate database has to registered, and details on what each contains must be given.
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For medics doing research, this could spell disaster. Some of them have thirty or more separate databases, most of which will only exist for a period of six months or less. Some databases may be created for just a day or so. It does not matter, it seems. Every single one must be registered (and paid for).

Some have said that it is just another revenue source for HMG (for those not familiar with the shorthand, that's Her Majesty's Government), some have said that it is totally unworkable - who will police it ? - and others have said that they know what the Data Registrar can go and do with his register - sideways...

Either way, something is in the offing. I have spoken to a number of those likely to be affected, and they are sitting tight for the moment, waiting to see what the real situation is, before they explode into action.

I suspect that when the excrement hits the fan, everybody is going to end up with freckles...

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BRAINSTORMS IN BERKSHIRE

At the beginning of February I descended on OTIUer RICHARD BLANDEN with the intention of subverting him to my TI BOOKLETS cause, and to learn a little more about the TI system. After having spent four days in his Think Tank brainstorming away, I emerged with jelly between my ears.

I don't think that I have ever seen so much research into the TI stored in one place before, and almost all of it has been with the conspicuous absence of assistance from Lubbock. Richard has discovered things about the TI disk system which I doubt even TI ever knew. No-one has given the definitive description of TI disks yet (to my knowledge) and I am hoping that I have absorbed enough of the torrent of information to be able to write an article or so on Richard's behalf. The flow of data was almost exclusively in one direction - from Richard to me - which is why my brain hurts. I think the latest we hit the sack was gone 3 a.m., which explains how we crammed about 42 hours solid TI study between 8 pm Friday and 5 pm Monday. I got the impression that we only just began to scratch the surface of Richard's knowledge. I only hope I can do full justice to his flow of information, especially since he gave up three of his four days off in order to attempt to educate me (a difficult task at the best of times). In amongst the other items which we examined was a more detailed look at the disk controller subprograms, which do not look as though they will be amenable to access from TI BASIC unless it is via MiniMemory or Editor/Assembler. In order to put this issue out before March I will have to omit any discussion of the CALLs or of the disk format, but I hope to be able to put something together by next month.

One final thing: even though you may be filled with burning questions, please don't go ringing Richard at all times of the day or night. He has little spare time these days and cannot really respond to requests like "tell me all you know".

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2021 note: In the next two paragraphs Peter has confused two entirewly different products:
J&KH Software produced a disk based product called SXB. Triton Products produced a module which contained TI Extended Basic, extended by further and modified routines by D C Warren, Danny Michael, Mike Dodd and M Shillingburg- called Super Extended Basic. It returned version number 120.

A long time ago I read a piece in the editorial of one of the popular micro mags which said that there would shortly be a unit called SUPER EXTENDED BASIC available for TI owners, to take the place of the late Extended BASIC. The suppliers were J & KH Software, if I remember correctly, and I heard some time back of someone who had actually been able to get hold of a copy. I asked for a review, but heard nothing.

Recently I learned that SXB (Super XB) is NOT a module, in fact it is a series of machine language subroutines which are loaded into the 32K RAM expansion, which would be fine if were not for the price - close to £100. While I have no doubt that there is a great deal of work behind this product, I can't help feeling cheated. It is probably extremely uncharitable of me, but there you are.

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PITCH IT HIGH

Recently I was sent a submission for TIHOME's Software Collection by a member of TIHCUC (the TI HOME COMPUTER USERS CLUB) which I could not load due to fading of the signal on the tape. I tried turning the volume up and down - it made no difference. Thanks to PAUL DICKS I now have a variable-speed tape recorder, but I rarely make use of the speed facility (+20% to -20% of "normal").

Reducing the speed met with no success, but when I increased the speed, remarkably, the tape loaded without a hitch. I know that micros generally require a "sharp" tone to the recording in order to load programs/data, but it had never occurred to me that although an increase in speed also increases the likelihood of missed data, a higher speed naturally means a higher-pitched sound.

If anyone has a dodgey tape which they think MIGHT load in this manner, and they don't possess a variable-speed machine, perhaps they would like to send me the tape(s) and sufficient return postage, and I will see what I can do.

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THE EARLY BIRD..CATCHES THE DISCONTINUED PRINTER

As part of the much-mentioned booklets project I have been in search of a cheap but effective daiseywheel printer, and until recently had seen nothing much below £345. I rather fancied the SMITH-CORONA TP-1, but at £300 it was a little out of my reach.

Imagine my suspicion then when I observe two firms selling the said TP-1 for around £145 plus VAT. I dillied, I dallied, etc., etc., and finally decided to give the firms a ring to find out what vital part was missing to make the price so low.

"Sorry, sir, we have no more left. Once folk heard that the model was being discontinued we shifted all our stock in a matter of days..."

Aaaaagh!

It seems the only stronghold left is in Ireland, where the retailers are asking the moon for a TP-1. The only problem is that I can barely afford a minor asteroid at the moment...

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TI-WRITER TIPS II

Following on from ALLEN BURT's article last issue, I played around with my TI-Writer some more, as part of a continuing investigation into the possibility of producing TI-LINES in the neat triple column format often seen in other newsletters. I think I may have the problem half-licked, and when I am a little more certain of the technique I will tell all in the august pages here. In fact, come to think of it, you'll KNOW when I have the problem licked, 'cos you'll see the new-new-look format on the front page...

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CHEAPER COPYING

As a result of access to cheaper photocopying provided for OTIU by one of its members, CHARLES LACEY, I am hoping to keep the price of TI-LINES close to its present level after MAY 1985. Please don't send in your subscription renewals yet though (says he hopefully) as the final costs have not yet been fully worked out. There is a sizeable deficit in the OTIU coffers, and I need to obtain confirmation from the accountant that the Inland Revenue will not take exception to my running OTIU at a loss (or at least, to personal disadvantage). I am also hoping that some of the revenue from the TIHOME Software Collection may be able to be channelled into OTIU to help with any expansion; we will have to wait and see.

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OPTICAL DISKS PART 2

Following on from the news last issue about the future progress of video and audio disks comes further information from the American periodical, SCIENCE DIGEST. It seems that several firms have been busy designing and developing the "write-once" version of the laser disk, and some are aiming their products directly at the personal computer market. Before I get too carried away, let me remind you (and me) that "personal" micros are technically up at the "business" end of the market - i.e., biggies like the IBM PC, the ACT SIRIUS (or whatever it is now called) and so on - not the VIC 20, the SINCLAIR ZX81, or the JUPITER ACE.

However, guess who produced a video disk controller to work with the PIONEER laser disk system ? I have heard nothing since the inital announcement some years ago - does anyone (particularly in ED YORK's group(s)) have any further information ? Knowing our luck, the entire system was probably junked before the first models could be delivered!
~~~~~~

Anyway, on with the story.

ALCATEL THOMSON produce GIGADISC (their spelling) 1001 which includes a 12" disk and drive and can store 2 gigabytes (= 2 * 1024 * 1024 K!). It sells (it says here) for about double the cost of a "magnetic disk drive", which doesn't mean a floppy drive - it means one of those mammoth hard disk drives.

Another optical disk drive manufacturer who recently entered the market is OPTICAL STORAGE INTERNATIONAL (OSI). Their baby has the same capacity as Thomson's and sells for $7000.

OSI plans to start mass production of a smaller 5.25" optical disk system for personal computers and to bring the cost down to under $1000 for a unit storing a quarter of a billion bytes per side. It is intended to reduce this price still further to make the system more competitive with floppy drives - currently less than $400.

Meanwhile the DREXLER TECHNOLOGY CORPORATION has taken things a step further. They already produce a small disk, but they have now added a wallet-sized card for £1.50 which can store the equivalent of an 800 page novel. The card is read by an optical photodetector, and if you are not sure exactly how much 800 pages is in terms of K, then a single A4 double-spaced page requires about 2K of memory. This means a minimum capacity of 1600K, or a little over 1.5 Megabytes. Hmmm.

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HELLO II

Even as I write, my words are becoming obsolete. We have gained another two members: D. J. F. CARR and R. H. GILES - to whom an equally warm welcome.

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AND FAREWELL

We say goodbye to ROBERT BATTS, the European Consumer Division's Consumer Relations Manager. Robert is heading back to the States this month, having managed to put up with folk like me for probably the longest of any of the ECD Managers. I have passed on good wishes for his future endeavours, and he in turn has bequeathed me all of the Assembly Language material on which he has worked - yes, he has a 4A of his own. Robert claims to be aspiring to be a Beginner with regard to 9900 Assembler, but he is many streets ahead of me. He had been in the process of providing Assembly Language equivalents to BASIC statements, and has provided me with copies of all of his notes. I will be running an occasional article on Assembler this year, and Robert's work will feature in it.

The post of ECD CR Manager must be one of the most thankless in the UK, a fact which did not fully impinge on me until after Mike Lunch moved on to other things. You see, ECD and TI are not one and the same thing. When Robert (and his predecessors) were asked questions by us, they did not have a ready source of information which they could tap. If they responded by saying "well, you tell us", it was not out of obduracy but genuine ignorance - Robert has been more persistent than the rest, but in the end he can only relate to us what TI Inc USA are willing to tell him (and that has not been a great deal).

Essentially ECD act as a buffer between TI Stateside and us, a very neat arrangement and one which has enabled TI to balk all our efforts to make something worthwhile of our machines. Robert did his best to help us, and he managed to be surprisingly successful on many occasions.

I shall certainly miss writing to him (about once a month on average), but I doubt if he will miss the endless stream of unanswerable questions (or the smaller stream of information).

I don't know if you will get the chance to read this Robert, but good luck and don't forget to write.

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PRINTER POST SCRIPT

I can recommend a fortnightly magazine called MICRO MART. It is a bit like EXCHANGE & MART, but for computers and related bits and pieces. I always read it cover to cover (I am trying to find the disk company who were making such cheap, good-quality, disks!), and quite often see 4As and other items for sale.

I had given up the hope of getting a TP-1, and I hadn't heard anything about its replacement either, so I looked through the end-of-Jan issue out of habit rather than with any purpose.

I came across another SMITH CORONA printer called a D100 which seemed a reasonable price, so I rang the firm concerned to get more information. By chance, during the conversation the salesman mentioned the magic phrase "along with our TP-1s". At this point my hearing suddenly became exceptionally acute. Interrupting his flow, I enquired about the TP-1, and discovered - whoopee! - that they still had some in stock. After cautiously asking for a quote on the machine I found it to be within my asteroidal price bracket (see earlier) and promptly ordered one. I then found that the firm did not accept any of the credit cards - did you know that it INCREASES the price of goods if a firm runs a credit card scheme ? - so I bunged a cheque in the post and beetled up to the bank to put the necessary folding stuff in my current account to cover it.

I will skip over the farcical procedure through which I had to scamper before the money went in (it involved a mad dash between two banks which are scarcely fifty yards apart) and for the first time in my life I had a wallet full of fifty pound notes. No, not fifty £1 notes, £50 notes. It tends to have an odd effect. On the one hand your step is lighter because you've got the chance to play Rockefeller (Editor leaps into the middle of the road, waves £200 at a passing traffic warden and invites her to lie down on the dotted white line while the long-suffering car drivers play chicken with her...), but on the other every oncoming pedestrian assumes the mannerisms of a potential mugger. Fifty yards can be a long way when you are under the influence of folding stuff!
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Anyway, to cut a bizarre fantasy short, all being well I should have taken delivery of the printer by the time you are reading this. If the Fates are really kind to me I will be allowed to produce the March issue of TI-LINES using a daiseywheel and carbon film ribbon cartridge.

In case you are wondering what all the fuss is about, the daiseywheel printer is one of the components in the grand Booklets Project, which is still in hand and slowly taking shape. Coupled to this is the equally grand Audio-Visual Aids Project (no, no, no, not THAT kind of AIDS!), and which should be unveiled at a later date.

Well, Time marches on and I must cease this gibberish or this issue will never see the light of day (or of the photocopier). The March issue is already taking shape and should be out more or less on time (which is journalistic license for "late again").

Peter Brooks

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C O N T A C T S

GRAHAM BALDWIN	32 Ellesmere Drive, South Croydon, Surrey CR2 9EJ Tel: 01 651 0657 (evenings)
Dr JOHN RICE	7 Lincoln Road, Swinton, Manchester M27 3WR Interests: getting the best out of his TI-Writer; printer dumps of graphics and screen displays; Forth; and generally getting the most from the TI.
ALLEN BURT	17 Wagtail Close, Twyford, Reading RG10 9ED

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B U L L E T I N B O A R D

WANTED WANTED WANTED WANTED WANTED WANTED WANTED WANTED WANTED WANTED

Recently-joined OTIUer CHRIS BAKER is on the lookout for a couple of things: an RS232 card for his PES, and a secondhand daiseywheel printer. Contact him on 0884 258272 if you have anything to offer.

FOR SALE FOR SALE FOR SALE FOR SALE FOR SALE FOR SALE FOR SALE FOR SALE

CHARLES LACEY has a 32K card for a PES if someone would like to make him an offer around £80. It has not been used, and I will check it out for the buyer before it is despatched.

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Here is a fairly short program for Mini Memory users to type in using the Line by Line Assembler that comes with it. The program itself isn't really of any great use, but hopefully will serve as an example of a 9900 assembly language program and of the use of interrupts on the 99/4A.

Anyone who has delved into the 99/4A console ROM and the Editor/Assembler manual will probably know that, 50 times a second, an interrupt signal arrives at the 9900 from the VDP (at least, I think it's the VDP that generates it). Assuming that interrupts are enabled at the time, this signal will cause the execution of the Interrupt Service Routine (ISR) whose address is stored in the word at address >0006 (on my machine it's >08FE). In fact, the 9900 stops whatever it was doing and performs the equivalent of the assembly-language instruction BLWP @>0004.

Careful examination of the ISR, which is about 422 bytes long, will reveal quite a few interesting facts. The routine is there to update sprites (providing the "automatic motion" feature), to control the sound chip (so you can CALL SOUND from TI BASIC and not have to wait for the sound to finish before you do anything else), to detect whether the QUIT (FCTN =) key is pressed (resetting the machine if it is), and to blank the screen if no key is pressed for a while. Each of the first three functions can be disabled by setting individual bits in the byte at >83C2 (-31806 in BASIC parlance). You can do this most easily by using the CALL LOAD statement.

CALL LOAD(-31806,16) will cause QUIT to be ignored,
CALL LOAD(-31806,32) will halt production of sound, and
CALL LOAD(-31806,64) will freeze any moving sprites.

In actual fact, the value of 32 does not mute the sound chip; it merely stops the process which feeds it with data. Hence if you set the bit in >83C2 while a sound is being produced, it will never finish since the instruction telling the sound chip to stop will never be issued. Alternatively, if you set the bit when no sound is being produced, all sound ought to be halted until it is un-set again. I say "ought to" because it isn't in all cases - INPUT beeps and error tones don't come out, but CALL SOUND statements result in a continuous, never-ending tone. This is (apparently) because CALL SOUND bypasses the interrupt-driven method of feeding data to the sound chip and switches it on "by hand". However, it then relies on interrupts to turn the sound off after the required time has elapsed. So if we stop this from happening, the tone will go on forever.

Anyway, back to the program. It uses the fact that if you place a non-zero number in the word at address >83C4 then the ISR will interpret that number as an address and call the subroutine which (it assumes) is at that address. For example: if you put the value >2345 into the word at >83C4, then the ISR will perform a BL @>2345 instruction fifty times a second or less. Or less? Unfortunately, yes. While the 99/4A is very busy (scrolling the screen, usually) it stops listening to interrupts (disables them) and the ISR is not executed. So you can't always rely on your subroutine being called 50 times a second, which is what makes the program more interesting than useful. It causes a digital clock to be displayed in the top right-hand corner of the screen, and keeps track of the time by counting the number of times that a short subroutine (whose address is placed at >83C4) is called. It assumes that 50 calls = 1 second, which of course will cause it to lose time whenever the 99/4A ignores an interrupt. It's worth typing in, though, if only to show that (very primitive!) "multi-tasking" is possible on a 99/4A!

Type the program in using the Line by Line Assembler (including the last bit, which will wipe out any other programs you may have in the MMM). The clock may be started by entering BASIC and typing CALL LINK("TCLOCK",H,M,S) where H is Hours (0-23), M is Minutes (0-59), and S is Seconds (0-59). S, or M & S, or even H, M, & S may be omitted - zero(es) will be assumed.

GARY HARDING

● = @

```
   AORG >7D40
CW BSS  6
TM DATA 0,0,0
TR DATA 50
DS DATA >9090,>9A90,>909A,>9090
ED BSS  10
*
TN DATA 10
TK DATA CW
   DATA CK
CI BLWP @TK
   B    *R11
*
CL MOV  R11,R10
   CLR  R3
   CLR  R4
   CLR  R5
   MOVB @>8312,R6
   SRL  R6,8
   JEQ  C2
   CI   R6,3
   JLE  C1
   LI   R6,3
C1 CLR  R0
   CLR  R1
   BL   @GN
   DATA 24
   MOV  R2,R3
   DEC  R6
   JEQ  C2
   BL   @GN
   DATA 60
   MOV  R2,R4
   DEC  R6
   JEQ  C2
   BL   @GN
   DATA 60
   MOV  R2,R5
C2 LI   R0,TM
   MOV  R3,*R0+
   MOV  R4,*R0+
   MOV  R5,*R0
   BL   @SC
   BL   @WC
   LI   R0,50
   MOV  R0,@TR
   LI   R0,CI
   MOV  R0,@>83C4
   MOVB R3,@>837C
   B    *R10
```

```
GN INC  .R1
   BLWP @>6044
   BLWP @>601C
   DATA >1200
   MOV  @>834A,R2
   C    R2,*R11+
   JL   G1
   LI   R0,>1400
   BLWP @>6050
G1 B    *R11
*
SC LI   R2,TM
   LI   R12,DS
S1 CI   R12,ED
   JHE  S2
   MOV  *R2+,R1
   CLR  R0
   DIV  @TN,R0
   SWPB R0
   AI   R0,>9000
   MOVB R0,*R12+
   SWPB R1
   AI   R0,>9000
   MOVB R1,*R12+
   INC  R12
   JMP  S1
S2 B    *R11
*
WC LI   R0,>0016
   LI   R1,DS
   LI   R2,ED-DS
   BLWP @>6028
   B    *R11
*
CK DEC  R6
   JNE  C4
   LI   R6,50
   INC  R5
   CI   R5,60
   JL   C3
   CLR  R5
   INC  R4
   CI   R4,60
   JL   C3
   CLR  R4
   INC  R3
   CI   R3,24
   JL   C3
   CLR  R3
C3 BL   @SC
C4 BL   @WC
   RTWP

   AORG >701E
   DATA >7FF8
   AORG >7FF8
   TEXT 'TCLOCK'
   DATA CL
   END
```

12

ENHANCED BASIC

An enhancement of TI BASIC available through STATISTICS and PRK module

Peter Brooks February 19

References: TI Document ARCHIV.PRK.DOC.SUBRLS1 courtesy of TI
Articles by, and personal communication with, PAUL W. KARIS

CALL H() - THE HEADER SUBPROGRAM : DISCUSSION SO DEEP YOU'LL NEED A DIVING BELL TO FOLLOW IT...

I have to begin by pointing out a small omission from the large Table in the previous issue. In my zeal to put TI-LINES together I forgot t indicate which of the items were to be regarded as STRING and which as NUMERIC. As it happens, all the necessary information is contained in the issue before last, but it would have been intelligent to have it a together in one place. To add to this, I discovered that I had also inadvertently left out an important piece of information on Page 17 o the last issue. For ITEM 11, the width is only handled automatically for SCIENTIFIC NOTATION, not for the others. Apologies all round!

This time we'll get down to some REAL work, with an example, no less.

However, a rather annoying bug has raised its ugly head, and at the moment I am at a loss to provide a way round it.

The PRK (and the Stats module for all I know) appears incapable of recognizing the fact that either an RS232 or a disk system, or both, require a certain amount of memory as "buffers". On several occasions now while preparing example material both for TI-LINES, and for a TIHO enquiry, I have been up the proverbial creek without a paddle because the module has decided to crash with a MEMORY FULL IN error message. I am 99% sure that this is because of the RS232 card, as the system is quite happy until I ask it to print a file in any format to the RS232. At some completely inconvenient point during the initial printing, the entire system goes on holiday without leaving a forwarding address, and I am forced to switch off and lose all the data which I have lovingly entered over 3 hours or so and absent-mindedly forgotten to save as a precaution. I relate these shortcomings of mine as a salutary warning to all who dare follow this rubbish.

This issue was to have seen the completion of CALL H() and the start of CALL G(), but lack of time and space has meant that H has gobbled up all of this issue's allocation.

FORM-FILLING

Perhaps one good way to begin to understand all of the facilities of CALL H() is to work through an example in the IMMEDIATE MODE. In fact, there is some degree of repetition involved, so to make life a little easier on both of us I will mix entries in both Immediate mode and in the form of a short routine (and I do mean short). Here we'll look at a simple form, its structure and likely contents, and how the structure can be transported to the PRK module (and possibly Statistics).

I detest filling in forms, and yet I have to admit to being quite fond of designing forms for others to fill. Here though I will try to limit my natural excesses and discuss a simple form for compiling useful data on members of a computer club (Cor! That's a novel idea, Brooko!).

So, with that in mind, what information will we be likely to want ? (Questions like "Have You Got A Big Sister" are out of order).

How about general details on all the club members - nothing too fancy, because the PRK and Stats modules will probably object(!).

I have drawn up a simple list of minimum requirements (with which you may disagree). I have chosen to ignore my dire warnings earlier in the Editorial with regard to the Data Protection Act.

The following items are not arranged in any definite order - I have placed related items together in some cases (just to be awkward).

1)	TITLE & INITIALS	This is for use in a Mailing List program to send out circulars and the like. For labelling purposes this will be useful.
2)	FAMILIAR TITLE	This is used in conjunction with DEAR, so that the circular can begin DEAR BALDIE or DEAR MR BROOKS. These are actually of only minor importance and you may well decide that they are not worth including.
3)	SURNAME	Standard requirement.
4)	ADDRESS	This is quite a tricky one. The limit to the data line of just 15 characters means that a full address will need several entries. These may not follow a simple pattern, which means that you have to cater for the largest likely address. I have chosen to use 5 lines for the full address (to allow for lengthy UK items or for overseas addresses, which often use a different format). I have also chosen to put the post code (or zip code) on a separate line. This gives:-

5) ADDRESS 2
6) ADDRESS 3
7) ADDRESS 4
8) ADDRESS 5
9) POST CODE

10) TELEPHONE

A phone number is often included in any reasonably informative database, although in this case only a total of 15 digits are catered for.

11) SEX

Yes, well, no doubt you have your own comments for this one. However, "Yes, Please!" does not count as a valid entry. Most folks (excluding certain pop stars) are either male or female - M or F.

12) TYPE OF MEMBERSHIP

Many groups have different categories of membership - FULL, HONORARY, ASSOCIATE, JUNIOR, etc., and this entry must reflect the diversity of types. F for Full, J for Junior, and so on, will be acceptable.

13) RENEWAL DATE

This can be helpful in that a Mailing List type of program can be run every day, checking all the entries and finding out who is due to renew membership, etc. For those who are either Honorary or Life members it might be simpler to make no entry at all (which is perfectly possible) and have the file processed only for those with entries in this section.

One thing which MUST be decided before any system is set in motion is the format to be used for the entry of dates. You can use any of several different formats, but ultimately the choice is limited to a form which does not result in confusion. You might consider a two digit day, a three character month, and a two digit year are sufficient to avoid problems: 1MAR86, 25DEC99, etc. Or you may decide that you will use a six digit system: 010386, 251299. This is fine if you are sure that there will never be any confusion - is 010386 the same as 3JAN86 or 1MAR86 ? The problem is worsened by the fact that the PRK and Stats modules will accept digits only for certain items (as is evident when using the modules at any time). Although the PRK for example begins its entry procedure by asking for a month-day-year, you can in fact enter day-month-year if you so choose.

14) PAID

This entry can indicate one of several things. Some people are in the habit of overpaying by rounding up all of their cheques. This can cause no end of problems (I speak from experience) in trying to ensure that records show them to be in credit. Here my intention is to record the total amount paid to date. This should not only take care of any overpayments, but should also indicate the period of time for which they have been a member. You could always make that a separate entry, of course.

That is all the information which I think would be relevant to club records - in fact I keep far less information myself on OTIU - and of course you may have totally different views and ideas.

Now comes the hard part - converting fully to PRK format. Thus far the items could be set out in a standard form (which I have not bothered to draw up - I have only limited space after all), - but PRK's 15 character limit for each entry of data is a little restricting. I have made some allowances above when allocating lines for the address for example, but none for exceptionally long names or titles: REVEREND for example, or MOUNTBATTEN-HUGES.

Let's now go through the list again, this time deciding how to describe (and ultimately, limit) the types of data required. There are a few things which we need to clarify first. The description of any entry (i.e. SURNAME, RENEWAL DATE) will have to fit within the 9 character length limit imposed by PRK, and conform to its rules for characters which are valid. For this reason, in some cases I have separated two words by a hyphen (-) where appropriate. You may choose a different approach. Here is the list again, with tentative entries describing the type of data required and allowed.

ITEM NAME	FOR PRK	DESCRIPTION OF LIKELY CONTENTS
Title and Initials	TITL-INIT	Allow the full 15 characters to try and cope with a wide range of entries
Familiar title	DEAR	Again, allow the full 15 characters to cope with as wide a range as possible
Surname	SURNAME	15 characters
Address lines	AD1 AD2 AD3 AD4 AD5	15 characters each. Even then, this may not cope with many addresses, and you may have to evolve some special processing to enable the full address to be entered and used
Post code	POST-CODE	You may choose to allocate the full 15 characters to this entry, in order to cater for coding systems in use abroad. I have chosen to restrict the entry to 9 characters (for the form four characters, space, four characters; e.g. SE99 14EJ, although the actual use is determined by you)
Telephone	PHONE	In order to allow entry of area codes as well, I have chosen another 15 character entry
Sex	SEX	A single character is all that is necessary
Type of membership held	MEM-TYPE	Aagin, unless there is some specific clash over membership descriptions, a single character will suffice
Date for Renewal	RENEWAL	I would prefer a 7 character format for this entry: 2 leading digits, 3 alpha for the month, and two trailing digits. This is to cater for those paying perhaps for two or three years at a time
Total sum paid thus far	SUM-PAID	You may need to allow for a much greater value here, but as this is an item which is likely to be totalled (and you may decide to make use of the onboard PRK routines to help out) I have chosen to define it as DECIMAL instead of the usual character form used so far. I have also chosen to use 2 decimal places, and to allow two digits to the left of the decimal point, which brings a total width of 5 including the decimal point

To summarise all of that:

No	ITEM NAME	TYPE	WIDTH	DEC
1	TITL-INIT	CHAR	15	
2	DEAR	CHAR	15	
3	SURNAME	CHAR	15	
4	AD1	CHAR	15	
5	AD2	CHAR	15	
6	AD3	CHAR	15	
7	AD4	CHAR	15	
8	AD5	CHAR	15	
9	POST-CODE	CHAR	9	
10	PHONE	CHAR	15	
11	SEX	CHAR	1	
12	MEM-TYPE	CHAR	1	
13	RENEWAL	CHAR	7	
14	SUM-PAID	DEC	5	2

S U M M A R Y T A B L E

You will see this table again later, generated as a check through the use of the PRK itself.

NITTY GRITTY

Now we come to the nitty gritty of this month's article: actual work on the machine itself. I am also going to have to jump the gun a little in order to make this example work, and invoke one of the subprograms which was not due to be discussed for several issues yet: CALL S().

Set your machine up with disk/cassette system attached, and insert your PRK (or Stats module - there may be some minor difficulties with regard to storage, which we will cover later).

Select TI BASIC.

Make sure that there is NO PROGRAM IN MEMORY. Type NEW if it makes you feel better. Then type:

```
CALL P(10000)
```

and then NEW. It is important that you follow the CALL P() with NEW, in order to force the 4A to re-assess its available free memory.

You will need a copy of TI-LINES V1.9 in front of you. Turn to page 18, where there is a rewritten copy of TI's own document, published with their kind permission.

What we will be doing is to set up the structure of the database by making use of CALL H() with successive values for INFO. We will call the file "CLUB-85A" and it is a simple matter to place that name in memory:

```
CALL H(0,1,0,"CLUB-85A")
```

Breaking that down, the first zero is the R/W parameter, which in this case indicates that we intend to WRITE information to the header. The second digit, 1, is the INFO parameter, and this specifies which item we are writing - namely, the FILE NAME (0 to 9 characters). The third digit, another zero, is the FLD parameter, which in this case is unused, so I have set it to zero. Finally, the string at the end is the V$ parameter (continuing the notation from page 18 of V1.9).

We will now enter the date into the relevant positions in the header. I have chosen January 1st 1985 as the date, and this is entered, again, very simply thus:

```
CALL H(0,2,0,1)
CALL H(0,3,0,1)
CALL H(0,4,0,85)
```

The first two CALLs store the day and month values (remember that I said that the entry can be made either DAY-MONTH-YEAR or MONTH-DAY-YEAR) and the third is the last two digits of the chosen year.

Now we will enter the names of each of the FIELDs (INFO = 9 on page 19 of V1.9). As this is a fairly repetitive process - we will be doing the same basic CALL fourteen times - we can enter and run a short routine to do the work for us. This will also demonstrate one of the advantages of the PRK database: once the data has been stored, you can virtually do what you like (apart from using BYE or FCTN =).

There are many different ways of doing this, but possibly the most straightforward method is to use this routine:

```
100 FOR L=1 TO 14
110 INPUT STR$(L):I$
120 CALL H(0,9,L,I$)
130 NEXT L
```

That's all there is to it. Because the INFO parameter has a value in excess of 8, the FLD parameter now has a use and a meaning (the loop controller, L, will provide the number of each of our 14 fields in turn, and in this case I$ will pass the FIELD NAME to the header).

Run the program, and enter the values from the ITEM NAME column in the Summary Table above.

Once those have been entered, edit the program thus:

Change line 110:

```
110 INPUT STR$(L):I
```

and line 120:

```
120 CALL H(0,10,L,I)
```

The program is now ready for entry of the TYPE of FIELD for each of the defined fields. The TYPE is given by either 1, 2, 3, or 4 - see page 19 of V1.9, under INFO = 10, and refer to the Summary table again, looking under the TYPE column. In all but one case the type is CHAR, which is represented by a 1. The last entry is DEC or Decimal, whose number is 3 (from page 19). All you have to do then is to run the program, enter 1 for thirteen INPUTs, and 3 for the last one. You might even be bold and alter the program to do it all for you!

The fun isn't over yet. We now have to enter the WIDTHs of the FIELDS, which are detailed in the Summary table (again). The program needs one minor but important change in line 120. As we are now dealing with INFO number 11, that parameter needs to be updated:

```
120 CALL H(0,11,L,I)
```

Run the program again, entering the Width values as you are prompted.

If you feel that you are getting the hang of it, you might like to insert a line to read the field name each time and incorporate it in the INPUT prompt (here's how, in case you need a little help:

```
105 CALL H(1,9,L,F$)
110 INPUT F$:I
```

If you don't feel that confident, don't make the changes.

Almost near the end. The last entry to be made concerns INFO = 12, which is the number of decimal places for a field of type DEC. We have only one of those - item 14 - and so a single command is sufficient:

```
CALL H(0,12,14,2)
```

Translating, this instructs the computer to WRITE, the number of decimal places, for field number 14, which is 2.

Now comes the jumping of the gun. If you have a cassette system, enter this:

```
CALL S("CS1",A)
```

and follow the instructions.

If you have a disk system, enter this (for drive 1):

```
CALL S("DSK1.CLUB-85A",A)
```

Once the SAVE is complete, PRINT A and check that it is 1. This should indicate a successful SAVE - although it may not be applicable to the cassette file.

Now QUIT with either BYE or FCTN = and select PRK this time. When the opening titles have got out of the way (press ENTER to speed it up), enter an acceptable date (perhaps 1, 2, 85 ?) and answer N to the query about the printer. There may be a problem with opening a file to the RS232 at this stage (should you be fortunate enough to have one).

Select the option to load a file, and depending upon the method of storage that you used, make a further selection. With regard to the disk system, enter the same file name as you did above for CALL S().

Once the file has loaded successfully, select the option to examine the file structure. You should see these two displays:

FILE STRUCTURE

```
NAME:          CLUB-85A
DATE:          1/2/85
ITEMS/PAGE:    14
PAGES USED:    0
PAGES LEFT:    59
```

FILE STRUCTURE

	ITEM	TYPE	WIDTH	DEC
1	TITL-INIT	CHAR	15	0
2	DEAR	CHAR	15	0
3	SURNAME	CHAR	15	0
4	AD1	CHAR	15	0
5	AD2	CHAR	15	0
6	AD3	CHAR	15	0
7	AD4	CHAR	15	0
8	AD5	CHAR	15	0
9	POST-CODE	CHAR	9	0
10	PHONE	CHAR	15	0
11	SEX	CHAR	1	0
12	MEM-TYPE	CHAR	1	0
13	RENEWAL	CHAR	7	0
14	SUM-PAID	DEC	5	2

Note the similarity with the Summary table earlier. Note also that the PRK module has defined the size of your file as 59 pages, of which there are none used (because we haven't reached CALL G() yet).

Go back into TI BASIC and experiment further on your own, examining some of the other INFO items, especially those which are automatically maintained by the Header routine. To read an item, set the R/W parameter to 1 and supply the necessary string or numeric variable in the V/V$ parameter. Specify the INFO and suitable FLD values, and see what you can find out.

Finally, for the desperately bug-ridden, here is an opportunity to be troubled even more by bugs: a full routine to place the basic items in the header for you:

```
100 CALL H(0,1,0,"CLUB-85A")
110 CALL H(0,2,0,1)
120 CALL H(0,3,0,1)
130 CALL H(0,4,0,85)
140 DATA TITL-INIT,DEAR,SURNAME,AD1,AD2,AD3,AD4,AD5,POST-CODE,PHONE,SEX,
MEM-TYPE,RENEWAL,SUM-PAID
150 FOR L=1 TO 14
160 READ I$
170 CALL H(0,9,L,I$)
180 NEXT L
190 FOR L=1 TO 13
200 CALL H(0,10,L,1)
210 NEXT L
220 CALL H(0,10,14,3)
230 DATA 15,15,15,15,15,15,15,15,9,15,1,1,7,5
240 FOR L=1 TO 14
250 READ I
260 CALL H(0,11,L,I)
270 NEXT L
280 CALL H(0,12,14,2)
```

That's all folks. Next issue: CALL G()!

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TI-WRITER TIPS

Peter Brooks February 1985

In the wake of ALLEN BURT's TI-Writer article last issue I thought I would follow with a couple of obscure but useful tips for TI's quite-sought-after module. As you will know, TI-Writer is used extensively to produce this newsletter - indeed it could not be produced in the time available without such a Word Processor - and as there is frequently a need to produce tables of data I have had to evolve small time-savers in order to reduce the amount of repetitive typing.

For example, I needed to produce a few tables for this issue's CALL H(), so I made use of the COPY facility in one or two cases. This can often be much faster than using the DUPE LINE function, albeit only when dealing with very large tables. I begin with a standard line of "|" characters (the vertical line) containing the necessary gaps for entries and then I begin copying, doubling the size each time. The DUPE LINE facility is slow in comparison: I can create the basic structure for a 64 line table in a matter of seconds and with fewer keystrokes.

The second, more useful example is my use of the REPLACE STRING function (or at least, one of my uses). It is possible to specify a START and FINISH column number when replacing strings, and I use this aspect to produce single vertical columns of any character I choose. If I am unsure about the actual format for a table, I will place one or two entries in what I consider to be the right positions, and then use RS to place the vertical line "|" between items. All I need to do is to give the same value for both START and FINISH columns - which information is provided through examining the TABS - and then use RS to replace the space character with the "|". I have to "open" some space first, often with the COPY function, and then when I am sure that the column is in the right position, I can select ALL, whereupon the TI-Writer will place a vertical column of my chosen character(s) from the starting point to the end of the file. I can even use RS to move vertical lines which have been placed incorrectly; if I want to move the "|" two spaces to the right WITHOUT affecting the rest of the screen, I set the data between the obliques (/) thus: /| / |/, and then select ALL to make the change run vertically through the file. Needless to say, the table upon which all this work is being lavished lies at the end of the file, or I would have a great deal of tidying up to do!

As a result of taking on the TIHOME Software Collection, I am know in receipt of a number of newsletters from across the pond (i.e the USA) and one of those has a very interesting and totally confusing short piece on modifying the RS232 default on the TI-Writer using Forth. I must admit to being totally confused, as I cannot find any correlation between what the author describes and what I've actually found, but I have no doubt that if I don't get it right someone else will put me right (says he hopefully).

All will be revealed next issue. As I now have a few extra items of equipment (courtesy of GARY HARDING) I will be delving deeper than ever into all sorts of things - including customising TI-Writer's files!

CLOSE FILE

One of the many projects which I am attempting to start is a detailed examination of the "special" files which the 4A can create on disk.

These are files whose specifications have a particular meaning to the system - a classic example is the DISPLAY VARIABLE 163 type, which is the form under which MERGE format files are stored. Once you fully understand the tokenisation process, you can write programs which literally write other programs. This is of immense importance in the field of Artificial Intelligence, as the machine can learn from its mistakes and replace those segments of program which led to those mistakes with other, better (perhaps) segments of code. Such PROGRAM GENERATORS can be used for a wide range of things - there is a well-known example (well, if you follow these things it is) in the shape of the LAST ONE, a program generator which allows you to produce database management systems without ever actually writing anything in BASIC at all. (That isn't the whole story, but space and lack of basic knowledge prevent me from discussing things further!)

The file format which has interested me of late is INTERNAL VARIABLE 254 which again has special meaning to the computer. I will discuss all the ins and outs of this type, why it is created, what it contains, and so on, in a future issue of TI-LINES. For the moment though I am on the scrounge for information. Does any more informed reader know whether the contents of such files are capable of interfering with a program designed solely to read each record and print the contents on screen ?

The reason I ask is that under certain circumstances one of my programs gets locked into a loop (deliberately) involving the statement:

```
INPUT #1:A$,
```

(note the trailing separator) where the INPUT # appears to fail to operate, and the program simply loops round printing the same thing over and over again (although it has not "crashed") without ever accessing the disk drive further. I can supply details for those interested in taking things further.

On the membership front, OTIU's numbers have been swelled recently by an enormous influx of TI-99/4A EXCHANGE members who have been reading my quarterly garbage collection BABBLE II. We are past the 50 mark and still rising. I am working to keep the subscriptions at the same level that they have been for this first year, and if the group gets much larger I will have to consider having TI-LINES farmed out to a Printer for that professional touch. However, the larger OTIU becomes, the less time I have for writing original articles, so I hope that our increased size will lead to an increase in the contribution of articles. Quite a few OTIUers have indicated that they are considering contributing one or two items, so the future looks reasonably bright.

All being well, the MARCH issue of TI-LINES should be almost on time; it has been quite an effort trying to produce three newsletters in the time in which I would normally produce only one!

Good luck with your programming, and don't forget to send in your articles for publication.

Peter Brooks