TIsHUG NEWS DIGEST

Focusing on the TI99/4A Home Computer

Volume 8, Number 3 March, 1989

Registered by Australia Post - Publication No. NBH5933

TIsHUG, where are we going?

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TIsHUG (Australia) Ltd.

TIsHUG News Digest

March 1989

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Annual Family Dues $25.00
Overseas Airmail Dues AUS$50.00

TIsHUG Sydney Meeting

The next meeting will be at 2pm on 4th of March at the Woodstock Community Centre, Church Street, Burwood.

Printed by
The University of Wollongong
Printery

TIsHUG News Digest ISSN 0819-1984

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They're off

by Geoff Trott

We have survived another AGM intact and can look forward to another year of interesting computing with the TI99/4A. For all of you who were unable to be present at the exciting event, I will quickly give you my recollections. I wonder why we wait a year before we receive the official minutes? Anyway, I think that everyone should have some idea of what transpired. You may even be wondering why I am still writing this column. There was a reasonable turnout of about 50 people (why so few women?) at the Burwood RSL Club, all duly signed in, who reviewed the past year and tried to set a new course for the current year. I knew something strange was going to happen when my first amendment motion was passed. The old Board presented their reports and yours truely asked a few questions and the meeting received the answers. Ross Mudie was presented with a certificate for his efforts for the group and there was also a certificate for a younger member, Vincent Maker, who was not present. Then Ross and I were singularly honoured by being proposed for Life Membership (is this like a life sentence I wonder?) and the meeting agreeing with unanimity. The only thing that worries me is that article 13(d) of the articles of association states that this must be done on the recommendation of the Board, who actually had no such recommendation to make. Nevertheless, I would like to thank all those present for their support and hope that all those unable to attend agree with this decision by the meeting. We then had the problem of getting two more nominations for Directors, which took a bit of arm twisting. I would have hoped that there would have been more interest in guiding the group than that. I can only wish the Board members all the best for the coming year.

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Co-ordinator's Report

by Dick Warburton

I am still recovering from the shock of being elected Co-ordinator, but as it wears off I am coming to terms with the reality. Having been elected, I will do my best to help the club grow and prosper.

I stood for a director's position because I really want to see this club continue as a viable and vibrant organization. I intend to examine all possible ways to help us grow stronger. I see my role as complex. Hopefully I will be able to maintain good communication between the directors and the membership. As well, I intend to seek the ideas of the members as a whole, particularly as to how we can improve our services to the members. I want to get your ideas to put before the directors, and to follow them through. I am sure we all recognize the need for some changes to meet the future. Since the election I have spoken to a number of people about where we are going as a club, and how we can achieve our aims. After some thought I feel the following issues are crucial for 1989.

Primarily we need to generate sufficient revenue to do the things our members want. We need a substantial income to maintain the quality of our monthly News Digest. We need income to offer goods at a substantial saving to members. We need cash to pay our basic expenses. We can make a little bit more if we choose to advertise our activities. I am proposing that in 1989 the directors should explore every avenue to sell basic items both to our members, and perhaps by mail to people outside the club. We could consider increasing the range of saleable goods to include such items as

Paper
3.5 inch floppy disks.
Printer ribbons.
Printer cables.
Quality imported software, eg Press

and perhaps disks of software for IBM Compatibles. Surely we can pay our way as a club if we market what computer people want at a reasonable price. To be successful, we will need more helpers both to run the shop, to buy what we need, and to publicize our activities.

My second major concern is, that the management of the club, should reflect as far as possible, the general desires and feelings of the majority of the members. To achieve this, I hope to be able to report regularly both through the News Digest, and at the monthly meetings, what is being done, and what is proposed. Hopefully there will be open discussion of what the members want, and need, at these meetings.

Thirdly I intend to propose the establishment of interest groups. The following have been suggested to me.

Programming in	Forth
	Pascal
	C
	Extended BASIC
	Assembly
Using	TI-Artist
	PRBase
	TI-Base
	Multiplan
	Funlwriter
Technical	Console repairs
	Expansion projects
	eg 32K memory, RAMdisk.

I have no doubts that there are other interest groups we could form, but we need to hear from you about what you want. I wish to propose to the directors, that we survey our membership as soon as possible, both through the meetings and through the News Digest.

As a final suggestion, I would like to see the club encourage a new software competition with clear guide lines for the programmers. We have some mighty talent. Let us use it.

I welcome any suggestions from the membership about ways to improve our club. I am proud to belong to TIsHUG and to know such capable and talented people as friends. As "Con the Fruiterer" says, "SHE'S A BEWDIFUL". The directors cannot do it alone. We need volunteers to help in any way we can. With the talent and ability in this club we cannot go wrong if we give it a go. Let us make 1989 the best year yet. o

TIsHUG in 1989,

or where are we heading?

by Ben Takach

Some remarks made during the 1989 AGM prompted me to put my thoughts to paper.

Before one can gaze into the crystal ball and make a prediction, one should look back and see where we came from.

No one ever thought 10 years ago, at the beginning of 1979, that we will end up with an abandoned TI99/4A computer and be in league with an enthusiastic bunch of guys who collectively know more about computers and computing than the most seasoned computer salesmen tossed around the many makes and models long since faded from the scene in the ups and downs of the formative decade.

One of the most essential ingredient of the happy co-existence of man and his machine is instant availability of information. To reach a point, where the TI99/4A community world wide knows more about the computer than its makers is unique in the turbulent history of computing. In fact, it had to become an orphan and thus give everyone a free hand to improve or force the owner to take matters in their own hand. Of course the computer had to be top class to begin with, otherwise it would have finished up long ago on the scrap heap along with such famous names like the TRS80.

I well remember the bygone days when I started to shop around for a computer. My aim was to get a work-horse to aid me editing a trade journal and to maintain the mailing list. My number one question to the sales wizard behind the demonstration machine was: "will it store 1600 names and addresses?" All I ever got was: "...it depends". I was absolutely lost! Qwerty, the most frequently used magic word to me was just an other variation of quiche or pizza. What a disappointment and let down when finally someone revealed the big qwerty secret to me!

The TI99/4A became popular and famous after TI dropped it. Sales sky rocketed in the USA beyond all expectations. TI had to restart the production lines to cope with the back orders. That was the time I purchased my first TI99/4A console in Lubbock for $US57 including tax. About 2 weeks prior to this, when I departed from Australia, it was selling here for $550.

Dropping its consumer products is a TI habit. The same fate awaited the extremely well engineered 58/59 programmable calculators, the successors of the TI99/4A, the CC40 and the 74. Each of these products had enormous undeveloped potential. I have expanded my CC40 from its original 6K memory to 32K in little more than 1 hour and for the cost of $25. This little exercise however happened a long way down the track from that initial $57 investment.

My biggest headache was caused by the absolute lack of TI99/4A information on the shelves of the computer shops and I did not know any one using a TI99/4A. Graduating to a near empty PE-box and a

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Secretary's Notebook

by Terry Phillips

All who attended the AGM would agree that it went off fairly smoothly this year and without the confusion we had last time with the nominations for Directors.

Your new board, who will manage the affairs of the group for the next 12 months are:

Co-Ordinator (Chairman) - Richard Warburton.

Secretary - Terry Phillips
Treasurer - Rolf Schreiber
Director - Robert Peverill
Director - Russell Welham

Looking at that list of names you will only see two of the directors from 1988 have continued, while there are three new caps. This, I feel, will be good for the group as it goes forward into 1989. New blood on a committee is always welcome and some new ideas on the groups direction should be forthcoming.

To Chris, Percy and Cyril, who all "retired" this year, I say good luck and a big thanks. It was a pleasure to work with you gentlemen on the board of this group.

We also have some new volunteers in other areas of the group; Craig Sheehan, well known software author and assembly tutor, has agreed to take on a new position which will be responsible for the organisation of the monthly meetings. This is a fairly arduous task, as it is not always easy to come up with new ideas that suit the majority of members whom attend the meetings. Good luck Craig, and if any members have any ideas to put forward, I am sure Craig would welcome them.

Lou Amadio from Wollongong has agreed to be Technical Co-ordinator. Lou has a wealth of technical expertise, as you would have noticed from reading some of his articles in recent issues. John Paine has not quit the scene, and volunteered to be available to assist any one who is having technical problems.

It was nice to see Ross Mudie recognised at the AGM for his valued contribution to the group over the past years. Chris Buttner presented Ross with a certificate which I am sure he will find an appropriate place to proudly display. Ross was given a further accolade a bit later in the meeting when both he and Geoff Trott were nominated for and approved as honourary life members of the Group. Congratulations go to you both for your sterling efforts.

Another certificate was to be presented to young Vincent Maker for his contribution to the newsdigest, in particular in endeavouring to foster some input from the junior permits per medium of Jenny's Younger Set Page. Vincent's certificate will go out to him in the mail accompanied by a congratulatory letter. Good work, Vincent, keep it continuing in 1989.

A big welcome to 3 new members who have recently joined the group. They are:
David Kent - Parkes
Cedric Que Noy - Ludmilla (NT)
John Mostovoy - Bondi

Applications are still coming from all points of the compass to join the group.

A big batch of local and foreign newsletters have been received over the past couple of months and passed to Warren to add to his ever growing library. Check them out with him as there are some very interesting articles.

That is it for this month. Hope to see as many of you as possible at the next meeting.

And here is a rundown on forthcoming events:

March 4 - Normal meeting - 1.30pm start.
The main topic for this meeting will be of interest to those people who are trying their best to become acquainted with that marvellous program - TI-Artist. If you would like to learn more of what it can do, come along and see it put through its paces by Russell Welham. Other activities are planned for this day and as usual the shop facility will be available during the afternoon.

April 1 - Normal meeting - 1.30pm start.
At this meeting we will have the benefit of Larry Saunders and his knowledge of the great new word processing program - Press. Larry will put Press through its paces, and judging by all reports on this program this will be a demonstration not to be missed. Normal shop facilities will also be available.

May 6
The band of volunteers who have the responsibility of organising meeting subjects are hard at work coming up with ideas. At this stage it is a little early to say what the events planned for this meeting are, but as soon as is finalised information will be placed in this file.

Letters to the Editor

The Directors and Members of TIsHUG,

At the TIsHUG Annual General Meeting I was humbled by what I consider were two great honours which were bestowed on me; the presentation of a certificate for "Service to the BBS and other club activities" and Honorary Life Membership of TIsHUG. I wish to thank the retiring directors for the certificate, especially Chris Buttner for his very kind words. My sincere thanks also to Rolf Schreiber and the members present at the AGM for the presentation of Honorary Life Membership, I feel both very honoured and deeply humbled.

Thanks...Ross Mudie...5th February 1988.

Myarc, Geneve Update

by Greg Hope

Hi all. Just a bit of update information on Geneve's availability in Pal-D. An order put in to Myarc, by Gary Christensen (Qld), last October has now been officially declared lost in transit and a re-order is being placed. The re-order, naturally includes those people who were unfortunate enough to have theirs lost but will also include anyone else interested in getting the computer. Current price in Australian dollars is $760. Gary requires that you send a $100 deposit now, if interested. His address is 36 Henzell Street, Kipparing, Qld, 4020 and he can be reached by phone on (07)284-1841. Other things being ordered now also include the Hard Disk Controller ($400), 512K Expansion for the Geneve ($400), Floppy Disk Controller (DS/DD) ($260), RS232 ($180), Mouse ($170) and an update for the Myarc Floppy Disk Controller to handle Quad Density/Double Sided ($40). Should you want any of the above, you have the address and phone number. Get in quick and you could have what you want in 6 weeks to 2 months.

PS, for an extra $5, you can be included on a mail only BBS, for Geneve. What this is, is a mail setup where someone who has a comment or Geneve program to share adds it to disk and passes it on to you. You are given the name of the next person to mail to and you can read or take or add whatever you like on or from the disk. Naturally, it will include all those nifty little hints and programs without having to type it yourself. If you are considering purchasing the Geneve or have already done so, this should be a must.

TIsHUG Software Column

by Terry Phillips

Version 2.0 of TI-Base is now available through the shop at the same selling price of $25. I am holding updates from Version 1.2 to 2.0 for the following members. Please see me if you attend the meeting in March; Robert Relyea, Eric Ockenden, Ken Trotman and an unknown member who purchased a copy at the December meeting. Whoever you were could you let me know please? To receive the new copy just present me with your 2 old disks which were in the package.

All other Inscebot software is back in stock and will be available at the shop. Members who have reserved copies should see me as I have held these aside.

From talking to some members it appears that there is tremendous interest in Press. Would you like the group to import this for sale? Remember the cost is around the $60US mark, so it wont be cheap by the time it is landed.

Not many new disks around over the past few weeks but here is a rundown on those received:

DISK A302 - PICTURES - 342 Sectors
There are 11 pictures on this disk and they are screens from Spectrum games which have been captured from tape and converted to run on our machine. A conversion program supplied on the disk enables you to convert them to TI-Artist format. Some excellent pictures which are very colourful. I hope to run some of these as a demonstration at the March Meeting. Full system required.

DISK A303 - PICTURES - 146 Sectors
More of the same, but only 4 pictures on this disk.

DISK A304 - PICTURES - 347 Sectors
More pictures. 12 in total on this disk.

DISK A305 - PICTURES - 347 Sectors
12 more pictures in the same format.

DISK A306 - FIDDLER ON THE ROOF - 177 Sectors
A good program that was around a few years back was a nicely animated musical version of the theme from Fiddler on the Roof. This disk has the old version on it, together with a revamped version that loads in about a quarter of the time. If you have not seen this before get a copy of this disk. It is good.

DISK A307 - PERKOVIC DISK - 137 Sectors
David Perkovic a young member from South Australia was obviously busy over the past school holidays. He has sent a disk of 8 programs which he wrote, all are in Extended BASIC. While they are all of the bombing or running type of game, congratulations go to David for his programming efforts.

See you at the meetings. If in the meantime you need any of the software available in the library, give me a call or write to the club address. o

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printer created a major problem. The printer would not print! The conflicting pin-out designations coupled with the top drawer Japanese English language of the printer manual presented an unsolvable puzzle. I managed to reach the first SSSD disk drive sophistication when I spotted an announcement in the Electronics Australia mentioning the TI99/4A User Group.

My TI99/4A and I have acquired a lot of polish and sophistication since those early Freddy Flintstone days using a rickety card table dubbed the work station. The TIsHUG membership was and is an essential ingredient to aid my progress.

Well, I guess most of the club members could tell a somewhat similar story. The reasons to buy a computer may be different, and it may well be used differently. However the thrill of hacking it, doing it alone without the help of large corporations (and generally at much less expenditure) solely by relying on members help is the much appreciated benefit of the user group membership. Without it one would be ignorant of the incredible support provided by the many small companies world wide for this computer. Who would have believed it in 1983 that 5 years after its maker abandoned the modest 16k computer it will be easy to expand it to use Megabytes of onboard memory and almost unlimited hard disk capacity?

I do not think this computer has reached the end of the road yet! Further, I could not name an other brand, which may be updated with such ease and at such low cost by owners who have no electronic training.

The club has accumulated a solid information base in its library and a remarkable array of useful hardware was produced by its members. The members, without exception, are dedicated to help one another, be it a program or a hardware problem. The news digest is an excellent publication. The bulletin board is better than any other I have logged on to so far. The club has no financial problems.

Well, this just about sums up the past and present.

With hind sight, the hardest job in my experience was to find TIsHUG. Like a secret society, its presence is only known to its members. We have in the heat of the battle ignored the PR and publicity side of the business.

Criticism is of little use without the offer of some practical solution. Advertising is tricky, costly and not necessarily cost effective. A $200 advertisement resulting in 6 new members would be an absolute dead loss! On the other hand a well written interesting feature article covering some hardware update aspect of the TI99/4A coupled with user group activity would be welcome by many editors of computer and electronic publications (editors will always accept a good public interest story). Such feature articles provide better exposure than advertisements and we would not have to pay for it. A well coordinated campaign could place 3 or more different feature articles tailored to the individual needs of a particular magazine. As an example, Ross Mudie's model train interface would be a well received project article by EA or ETI.

Finally some thoughts regarding the club's future. We do know that the TI99/4A was a very advanced design, it is years ahead of its competitors even to date. It has some limitations, but these do not render it less useful than any other make on the market today costing ten or more times more than the TI99/4A. Nevertheless advanced technology will make it a museum piece sooner or later.

If one has to produce a program or a file which will run or can be manipulated by another brand of computer then one is forced to use a compatible machine. The TI99/4A is not compatible with any of the popular clones. Compatibility, or the lack of it, will compel more and more TI99/4A users to acquire a second system. These are the facts, however these should not spell the end of the club. Members will exchange similar software and technical information pertinent to the new machine like in the past. Some of the arguments will be centered on the merits of the MSG (Mega-Sour_Grape) brand versus the MP (Mighty-Pineapple). Then again we might see some new development, which would convert the invincible TI99/4A to be a MSG or MP emulator. Either way it will be fun just like now. o

The Communicators

Special Interest Group for users of TEXPAC BBS.
by Ross Mudie, 6th February.

1. BBS SOFTWARE.

I have been reviewing the BBS software and would like to share my thoughts with members to allow discussion and input from members.

I anticipate continued use of the TEXPAC software for the BBS operations since it has proven to be very reliable in the unattended state of operation. I have a number of changes planned for the BBS this year if available time permits. The changes currently under consideration include:

a) Freeing up assembly memory space by saving the BASIC program, tables and variables on disk when uploading or downloading a program which uses the VDP RAM as a buffer, rather than saving the BASIC information in CPU RAM. (About 15K of CPU memory).
b) Putting the menus for programs and news files into assembly to free up VDP RAM space for the BASIC program to allow more features to be added easily.
c) Providing flagging for each user to show what NEWS files they have not read. This is hoped to be achieved by placing an asterisk "*" adjacent to the unread file names. This would also be reset when any file, including Sub-Editor's files, are uploaded.
d) Provision of an option for "bad users", that is, people who have forgotten their password, potential new members or past members, etc, to leave a message for the SYSOP in a special file.
e) Provision of a modified mail editor which would be capable of placing new file contents before the existing file contents. This would cut out the need for SYSOP intervention in the operation of areas such as the ALL file, advertisements and would make self maintaining discussion rooms quite possible.

The amount of this software work which gets done is of course dependant on my spare time during the year. I can not give any undertaking as to what may get done. Whilst I would also like to look into XMODEM, I do not think that I will find sufficient time. I also hope to expand on the Computerised Train Set project and since this project will have some direct application to my own family it will be given higher priority.

2. PROGRAMS AND FILES.

I am totally dependant on others to supply programs and files for inclusion in the BBS each month or two months. I am prepared to implant assembly programs to make them downloadable and runnable on 32K cassette loaded systems. I need the assistance of more members to run Sub-Editor files, I have received no offers from last month's Communicators yet, not even from the user who thinks the BBS lacks life! Very seriously, TIsHUG, that is YOU the members, needs more member participation. Just one way is for more members to run a little part of the BBS or to upload your favourite program so that other members may benefit. Please help.

3. MATERIAL FOR THE TIsHUG NEWS DIGEST.

BBS members can place material for the TND on the BBS by sending it as mail to EDITOR. The deadline for copy for the next month's TND is the Wednesday after the meeting on the first Saturday of the month. Prepare files in D/V80 format without control characters by saving it to disk with PF or by using the E/A editor. Send the file using the SENDMAIL program which is available for download from the BBS.

4. OPERATION OF THE ALL MAIL FILE.

The ALL mail file is a method for any member to place an advertisement or information for everyone to read on the BBS which is immediately readable. The file is built up in the APPEND mode which means that new information is added after any existing information in the file. If large files are placed in the ALL mail file then other users have to read the whole file to see if there is a little add, etc after it. There is no file size limit but members are asked to limit the size of any item placed in mail to ALL to a reasonable size, say 30 lines. If you want to load a larger file then please send it as mail to SYSOP so that it can be placed in a suitable or special file. It will not be immediately readable but it also will not clog up the ALL mail system.

From the Bulletin Board

MAIL TO : ALL
MAIL FROM : CHEMTECH

Greetings All. Can anybody offer me a clue about a problem which suddenly appeared on my TI99/4A yesterday. It seems to be associated with the Extended BASIC module in as much as programs loaded in Extended BASIC are getting hopelessly corrupted. E.g. Mass Transfer will load, but will not run and gives an error that is, a SYNTAX ERROR message due to the 2nd line of code containing garbage. FunlWriter will not even load properly.

I have not tried any other programs yet, but I have cleaned the Extended BASIC module contacts, and have generally checked for loose connections of anything obvious. Checking SIZE gives me 11840 stack and 15864 program space, a little less than indicated in the manual. I had a similar problem a year or 2 ago which turned out to be faulty buffer chips on the memory expansion card. That fault was diagnosed and repaired by John Paine.

I cannot remember if the fault I have now is exactly the same as the previous one. Hope somebody is able to help. Bye and regards....Tony Beuermann.

MAIL TO : ALL
MAIL FROM : CO-ORD

For urgent sale:
2 Consoles c/w power supplies; 1UHF and 1VHF modulator
1 PE Box with TI Disk Controller Card, 32K memory
1 Speech Synthesiser
Editor Assembler; Forth; Direct Writer; TI-Writer; SST Compiler
2 Extended BASIC Cartridges
TEII Cartridge
Cartridges:
Household Budget Management
10 Assorted Games
Touch Typing Tutor; Multiplication 1; Division 1; Computer Math Games VI Scholastic Spelling Level 4 and 5
All Infocom Adventure Games; Moonbeam Software
23 assorted disks of games
200 plus program listings; magazines and programming books.
Asking $1000 o.n.o.
Willing to negotiate for a quick sale of the lot!
Contact Joe on Phone 871-6748 after 4.00pm

MAIL TO : ALL
MAIL FROM : ROSCO

Wanted Wanted Wanted
Touch Typing Tutor module - phone Ross on 6376772 (home) 2408164 (work)

MAIL TO : ALL
MAIL FROM : GOWFAR

Wanted Wanted Wanted Wanted!!

I have 3 keyboards that are in the process of dying (2 have and the last one is not too healthy) and I am planning to buy, very soon, a Geneve. As most of you know, I run SCI-FI BBS and until I get the Geneve, I need a working keyboard (preferably prior to '83 but I am not too fussy at this moment). I would like to hear from anybody who is willing to sell that keyboard they have tucked away for emergencies. Also, I would like to hear from anybody interested in selling 1 DS/DD floppy drive as 1 of mine is also not too happy about all the work it is asked to do. Please leave mail to GOWFAR, here, or SYSOP on SCI-FI BBS (646-4865).

Extended Display Package, part 5

by Craig Sheehan

As promised last month, there will be nothing terribly new in this article. I will overview programming with XDP, show a few peeks and loads, and provide a list of currently known bugs. However, first I must provide corrections to last months article. In the listing, lines 11030, 11040, 11050, 11140, 11210, 11260 and 11900 have the reverse slant ("\") printed rather than the string concatenation character ("&"). Also, part of the third paragraph of the right hand column on page 8 reads "which as a base 32 number is 1 | 32 + 21" which should read "1 * 32 + 21". It appears the absence of two transliterate commands were responsible for these errors.

[I must apologise to Craig and all of you who were caught out by those errors. We were a bit rushed at that time due to a combination of circumstances and did not check carefully enough. Ed]

As last months article demonstrated, programming with XDP is little different to what is used from normal Extended BASIC mode. The only part of your program that need change is screen handling. The main reason for this are changes to memory architecture under XDP: what used to be the screen memory is now used for character codes and disk buffer space becomes the screen as well as other miscellaneous buffers. Any command that alters what is seen on the screen must be substituted with its XDP equivalent.

Commands that should not be used at any time whilst a program is in XDP mode are ACCEPT, CALL CHAR, CALL CHARPAT, CALL CLEAR, DISPLAY, CALL GCHAR, CALL HCHAR, CALL PATTERN, CALL SCREEN, CALL SPRITE and CALL VCHAR. All of these commands have direct equivalents, some of which we have already seen in earlier articles. Other commands can be used in some situations but not in others. INPUT, LINPUT and PRINT may be used for file handling but not for use with the screen. Similarly, CALL COLOR is used to change the colour of sprites but not for changing the colours of character sets.

There is little change in the use of sprites. All of the commands normally associated with sprites are used, with the exception of CALL SPRITE and CALL PATTERN. It should also be noted that sprites can not be used whilst in forty column mode.

Nearly all of the replacement commands have the same format as the original Extended BASIC versions. Notable exceptions to this are ACCEPT and DISPLY. In other cases, whilst it will accept the same format as Extended BASIC, they will also accept alternate formats. As an example, once a repetition has been specified in HCHAR or VCHAR, all of the arguments may be repeated enable several lines to be drawn from the same CALL LINK.

XDP also has more graphic characters and colour sets than normal.

Redefinable character codes now range from 30 to 239 and colour sets from 0 to 26. Individual colour combinations for character sets is only possible from thirty two column mode. In forty column mode, all characters have the same foreground and background colour which is set with the SCREEN command.

Apart from these changes to screen handling commands, there is no change to how you would normally write a program. Fortunately, normal error messages are issued, except for warnings which are automatically disabled by the package anyway. So next time you write a program in which XDP's features are needed: do not be afraid as it makes programming no more difficult.

XDP has a few peculiar peeks and loads that allow you to obtain information on window sizes, the mode, default colour combinations and the number of characters available for plotting (more on this next month). Whilst your program can keep track of these variables, some people still insist on using them despite the loss in readability that comes with them. The following table gives some of the more useful peeks and loads available through XDP. An asterisk denotes that the value in that address should not be changed with a load. All addresses are in decimal.

Address	Comment
9471*	Contains the current width of the window in columns.
9511*	Has either the value 32 or 40 depending whether 32 or 40 column mode is active. If normal Extended BASIC mode is active, then this address contains 0.
9513*	Current plotting character. This is the next character that will be redefined if necessary for Hi-Res graphics.
9515*	Upper limit of characters to be redefined for Hi-Res graphics.
9517*	First character redefined for use with Hi-Res graphics.
9571*	Holds the width of the window in rows.
9373	The least significant four bits are used as a buffer for the last screen colour in 32 column mode. Whilst in 40 column mode, loading the a colour code number with one subtracted from it, causes that screen colour to be set next time 32 column mode is called.
9375	As for (9373) except the foreground and background colours for 40 column mode are stored here. To calculate the code for a certain combination use the formula: (Foreground - 1) * 16 + (Background - 1)

The following program shows the use of some of these peeks and loads:

```
100 CALL LINK("XDP")
110 CALL LOAD(9575,47)
120 CALL LINK("MODE",40,10,20,5,34)
130 CALL PEEK(9471,COL)
140 CALL PEEK(9571,ROW)
150 CALL LINK("DISPLY",1,1,"COLUMNS.VA.CRROWS.VA",
    COL,ROW)
160 CALL KEY(0,K,S):: IF S=0 THEN 160 ELSE CALL
    LINK("NORMAL")
```

Line 110 sets the colour combination for the next time forty column mode is entered. The selected colours are a medium green foreground with a white background. Hence the required value is:

(3 - 1) * 16 + (16 - 1) = 47

Note that a CALL INIT statement is not required as one has already been executed when the package was loaded. If you do happen use a CALL INIT, XDP will be erased from the memory and would need to be reloaded. The mode is changed to 40 columns in line 120 as well as setting a window of 11 rows and 30 columns with the top left hand corner at position (10,5). The size of the window is found, by peeking, on lines 130 and 140, and the results printed on line 150. Line 160 simply allows the program to be exited by pressing any key.

Finally, the dreaded bug report! No matter how hard you try, they always seem to slip in and evade your detection at testing time. Currently there are two that I know of in version 2.0. The first one is that occasionally arguments for specification commands from DISPLY are ignored and printed on the screen. The second showed itself in last months listing: the screen is made a mess in 40 column mode when disk files are used. This does not occur in 32 column mode and does not harm the disk in any way. If any other bugs come to your attention, please tell me about them so they can be corrected in later versions.

There are no references for this months article. Any comments or queries (yes: I do answer them!) can be addressed to:

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Mona Vale NSW 2103

Next Month: We will start examining the use of Hi-Res graphics from XDP.

Death of a Computer

compiled by John Paine

Parts of this article first appeared in the Texas Weekly during April 1984 and have been reprinted in a number of publications since. The Texas Weekly has been supplemented with other information that I have gleaned from all sources in the meantime.

I trust you will appreciate and enjoy the background to the demise of the TI99/4A.

Almost immediately, people at Texas Instruments were calling it Black Friday. Early in the afternoon of October 28, 1983, the rumours began to fly and at the company's Lubbock, Texas based consumer products group, the rest of the day was chaotic. Middle managers called employees in, a few at a time, to tell them that yes, it was true and there was nothing that could be done, and then everyone in Lubbock was on the phone to friends at all other TI facilities, and by 4 pm when the official corporate announcement was released to the press, there was not a soul at the company who had not heard the bad news. Texas Instruments, the company that had put more computers into American homes than anyone else, was pulling out of the home computer business.

Who could have imagined that it would end this way? Only a year earlier the Consumer Products group had been the toast of Texas Instruments, and the TI Home Computer, the TI99/4A, its biggest success. Back then, TI people talked about the TI99/4A with awe. It was destined to dominate the home computer business, they said. It was going to to reach $1 billion in sales. It was going to be the biggest winner in the history of the company. Back then, TI assembly lines in Lubbock were cranking out 5,000 computers a day and that still did not keep up with the demand.

It was not suddenness alone that made the TI99/4A's fall from grace so stunning. Texas Instruments was a proud and stubborn company that helped spark the electronics revolution. It was not accustomed to failure.

Texas Instruments had always been the worlds largest maker of semiconductors, but in 1983, for the first time, it was out produced by Motorola. Texas Instruments had practically invented the digital watch but several years ago it could only stand by as its watch business was swept away in a flood of foreign imports that were not only cheaper but also better.

The home computer fiasco made these other difficulties pale by comparison. In just two quarters of 1983 the TI99/4A cost TI an astonishing $400 million in corporate losses. In July, problems with the TI99/4A forced TI to post the first quarterly loss in its 50 year history. On Wall Street TI stock dropped 39 points because of the home computer.

Nobody likes to dwell on failure, least of all Texas Instruments, so it is no surprise that that the company officially "declined to cooperate" with this account of the rise and fall of the TI99/4A. The two men most responsible for the decision to get out of the home computer business, chief executive officer Mark Shepherd and chief operating officer J. Fred Bucy, were unavailable for interviews.

In 1975 the personal computer industry was still in its infancy. Apple was a tiny company operating out of its founder's garage: IBM had not even considered getting into so nebulous a venture. The handful of people who bought computers were mainly technology buffs. That year Texas Instruments introduced something called the TMS9900 microprocessor chip, which would eventually spawn the TI99/4A computer.

Although selling consumer items like pocket calculators and computers is what gives TI visibility, the company's biggest profits have always been made in less glamorous ways, chief among them the manufacture of silicon chips, which it sells in massive volume, at low prices to other companies. Getting the volume up and the price (cost) down has always been the linchpin of TI's sales strategy. And so it was with microprocessors.

TI did not invent the microprocessor (Intel did) but they quickly asserted their superiority in the market place with their first chip, introduced in 1974, a four bit chip called the TMS1000. This soon became the most ubiquitous chip in the business, used in video games, calculators, microwave ovens, and hundreds of other electronic products. To date, more than 100 million TMS1000's have been sold.

TI's second generation microprocessor was the TMS9900, but although it was a quantum leap technologically, it was a flop in the market place. It failed in part because it was too far ahead of the field. While Intel and every one else was just beginning to make 8 bit processors TI leap-frogged them and made the 16 bit TMS9900. The idea was that the TMS9900 would make the 8 bit processors obsolete, and this new TI microprocessor, like the TMS1000 before it, would become the industry standard. Instead the industry flocked to the 8 bit microprocessors and left the TMS9900 dying on the vine. But to back down and build an 8 bit microprocessor like every one else was was an abhorrent idea for TI, a company where managerial decisions are shaped by an internal framework that is a culture all its own.

The Texas Instruments' culture is at once the company's greatest strength and greatest weakness. It was the culture that made it possible for TI to rise from its beginnings as a small, geological service company and become a $4 billion electronics giant. TI engineers tend to live near each other and spend most of their free time in each other's company. Many of them come straight out of college, TI does not like hiring mid-career outsiders. Their loyalty to TI is fierce and total. In return, TI gives its engineers what amounts to lifetime tenure. They are rarely fired.

TI is run by engineers for engineers. Both Shepherd and Bucy began their TI careers as engineers, and almost all of its top managers have engineering backgrounds. Thus, they understood the needs of engineers, the need for autonomy, for instance. Despite the company's size, the TI chain of command is quite short, and Bucy and Shepherd try not to get in the way of managers who are doing well. The company never skimps on its research and development budget, no matter what its cash flow needs might be. R&D, which is what engineers live for, is at the heart of Texas Instruments' technological success.

But engineers have other psychic needs, and these too have become part of the TI culture. One is the desire to accomplish things from scratch rather than use existing products. At TI this frame of mind has led to an obsessive dislike of, and even contempt for, other companies' products. Thus the same TI culture that spawned breathtaking innovation also spawned less attractive traits, like arrogance and corporate hubris, that hurt the company. TI did not just want to be competitive in the markets it entered; it wanted to dominate them.

Given that corporate culture, there was not much doubt that TI would stand by its own microprocessor, the TMS9900, rather than conform to a marketplace that wanted 8 bits instead of 16. The preferred solution was to find an internal use for the TMS9900 that would make it profitable. One possibility was to build a consumer product, a computer, that would be driven by the TMS9900 microprocessor. It was a classic TI solution, TI divisions have always been able to post profits by selling components to other TI divisions, but it also meant that TI would be building a computer to fit its microprocessor rather than the other way round. Though no one could know it at the time, the TI culture had just led the company into its first big mistake.

By 1977 the lengthy research and development process was in full swing. The consumer products group which designed and manufactured TI's pocket calculators and watches, was given the assignment of coming up with the next product and was given spacious new quarters in Lubbock. Moving to Lubbock from company headquarters in Dallas was Bucy's idea. Texas Instruments' number 2 man and consumer products group's long time guardian angel was a native of Tahoka, only 29 miles from Lubbock.

Within the consumer division, the move was quickly seen as another mistake, for it turned out to be very difficult to persuade computer engineers to move from Silicon Valley, less than an hours drive from San Francisco, to Lubbock. But the bias against outsiders and the company's do it ourselves attitude led TI's top management to believe that it did not really need experienced computer engineers from the outside, even though the company had never before made a personal computer.

The strategy developed by the consumer products group was to build three computers using the TMS9900 microprocessor, aiming each at a different segment of the market. At the high end would be a small business computer that would retail for about $7000; in the middle, a sophisticated scientific calculator that would cost about $1000 dollars and at the low end the so called Home Computer which would cost between $300 and $400. While the first two computers would be competing against other companies' products, the home computer was an original idea.

At the time, a few companies were selling machines called personal computers, notably Apple and the Tandy Corporation of Fort Worth, Texas, but they were not what we have come to think of as home computers. They were expensive, geared for a select market of business men who wanted to work at home and hobbyists who like to fiddle with computers.

The TI machine, on the other hand, was going to be the first computer designed for Everyman. Did Everyman need or want a computer in his home? That was impossible to say, because no such product existed and most people had no feel for how a computer might be useful. Yet TI was unperturbed by the prospect of trying to create a market. The feeling at TI was that it had a knack for consumer electronics and that its knack would come to the fore again, with the home computer. TI would put out a computer that was just powerful enough to entice the average person to take the plunge, no word processors, but plenty of educational programs for the kids, yet inexpensive enough that the plunge would not break the bank. On the basis of price alone, TI thought, the machine would sell. Convincing people that they needed it could come later.

It was not long before events began to conspire against the consumer division's carefully laid plans. First, the man who had devised the three computer strategy quit in frustration over the problems he faced in Lubbock, particularly the inability to hire the outside engineers he thought he needed. Then his chief supporter back in Dallas headquarters took an overseas assignment. Other division heads complained to top management that the business computer and the calculator did not belong in the consumer group, and they managed to have those two computers taken away from consumer. Both projects were eventually killed.

So the three computer strategy was now a one computer strategy, and that computer was at the low profit end of an unknown market. To make matters even more complicated, there was another management shuffle in 1978 and the man put in charge of developing the home computer was an engineer whose previous job had been to design the expensive business computer. He did not see the home computer in quite the same way that his predecessor had and by the time he finished tinkering with the design, it was no longer a $400 machine but a $1,150 machine. Then, although TI had announced that the computer would be ready by the middle of 1979, the engineers did not shake all the bugs out of the system until the first few months of 1980, and thus missed the opportunity to cash in on the 1979 Christmas season. And finally, when the new TI99/4 hit the computer stores, it turned out that the average American had no idea what to do with a home computer and was not interested in paying $1150 for one.

To the great dismay of everyone at Texas Instruments, the TI99/4, four years and $10 million or so in the making, was a bomb.

The keyboard is what computer people most remember about the TI99/4 home computer. The keyboard somehow became the symbol for everything that was wrong with the machine. It looked like an elongated calculator keyboard, with stubby little keys that popped through the plastic casing. TI had chosen a calculator keyboard because most of the engineers who developed the TI99/4 had cut their teeth on calculators. But a short time before the TI99/4 came out, another company had put a calculator keyboard on a personal computer. The keyboard was widely criticised and out of that experience grew a belief that calculator keyboards would not cut it. Texas Instruments, so intent on putting out its own product, scarcely noticed.

It should have, for something significant was afoot. Five years earlier, when Texas Instruments first decided to get into the consumer end of the computer business, the field was wide open. There were not any real industry standards because there were not enough machines being made. The companies that did well were simply the ones first there with the technology. By 1980 the computer industry was entering a watershed period, a period when being there first no longer ensured success. The moment was about to arrive when the importance of creating a product would be superseded by the importance of selling one. It is a moment every new industry faces eventually.

In the computer business, this watershed meant that from now on, you ignored the vagaries of the marketplace at your own peril. Advancing the technology was no longer enough, you had to be sure that you were advancing it in the direction that the market was heading. Timing became critical. If you did not have the right product at the right moment, it would likely fail.

Most of all, you had to be able to explain what it was about your computer that set it apart from the pack. Doing that took the skills, not of engineers, but of marketing people and companies that had always depended on feats of engineering for success were bound to have trouble.

So the lesson of the calculator keyboard was not that it was an engineering mistake (at bottom, it really did not matter what kind of keyboard you used), but that it was a marketing mistake. And the same applied to other facets of the machine. Using the TMS9900 microprocessor, for instance, was good for the Texas Instruments division that made the chip, but it caused far more problems than it was worth.

Because TI's chip division had to make a profit despite the low demand, the cost to the consumer division was very high, about $20 a unit compared to about $4 for most of the popular 8 bit microprocessors. Because it had been designed for industrial uses, it did not adapt well to a consumer system; the advantage of having a 16 bit microprocessor was negated by the circuitous way programs had to be written for it. And because nobody else in the industry was using it, independent software companies, the third party vendors, as they are called, had no incentive to write programs for it.

Not that Texas Instruments wanted third party software, which was yet another way the company was bucking the system. Software is the most profitable part of the computer business. A $40 program cartridge costs Texas Instruments about $6 to produce. But one of the new rules of the marketplace was that software companies could write programs for any computer, and

then pocket all the profit themselves. TI hated the thought of sharing that kind of lucrative profit with outsiders.

So instead of making it easy for software companies to market programs for the TI99/4, TI went out of its way to make things difficult, even making adjustments in the machine that kept outsiders from writing software for it. The result was that while there were hundreds of programs for most personal computers, there were only a handful for the TI machine.

By fall 1980, with Texas Instruments selling fewer than 1000 computers a month, the people in the consumer products group had come to the not unexpected conclusion that it was time to go back to the drawing board. Peter Bonfield, then the head of the home computer division, felt that the most critical flaws in the TI99/4 were its price and its TMS9900 microprocessor, so he asked his engineers to design a computer that used a different microprocessor and that cut the cost in half.

The chip they chose was the Z80, first manufactured by the Zilog Corporation, one of the most widely used 8 bit microprocessors. The design for the computer they came up with was so good that they might get the new design past Bucy and Shepherd, and past an engineer named Don Bynum.

Bynum was 36 years old and a newcomer at TI. He stood out from the gray mass of TI engineers because he had a little more talent than most of them and a little more drive and little more flair. But what he had most of all was compelling personal presence. Bynum was a great one for rallying the troops. When things were going badly, he liked to give what he called his General Patton speeches, and the people under him would stay later and work harder until everything was right again.

When Bonfield's new computer design began making the rounds at TI's Dallas headquarters, Bynum was assigned to the company's Corporate Engineering Centre, where research and development proposals were evaluated. This position allowed him not only to see the design but also to take sides. He sided against Bonfield and quickly became the leading in house critic of the new computer. His entire argument was based on the idea that the TMS9900 microprocessor should not be abandoned, precisely what Bucy and Shepherd wanted to hear, of course. To prove his point, he put together his own redesign of the TI99/4, called the Ranger. The Ranger did not solve the price problem or the keyboard problem or the software problem, but it did address another nagging problem, the haphazard way the peripherals fit together with the computer.

When Shepherd and Bucy shot down the Z80 design, they also shipped Peter Bonfield off to the calculator division (he left TI soon thereafter) and replaced him with Don Bynum. In November 1980, Bynum moved to Lubbock to run the home computer division, and the first thing he did was to confiscate all the prototypes of the Z80 computer. The second thing he did was trot out his Ranger designs. And the third thing was realise that the Ranger was a mistake.

A couple of months after he arrived, the Ranger was as dead as the Z80 computer, for Bynum had seen designs for yet another computer, and he had fallen in love.

The new design had been slapped together by a small group of engineers. They were frustrated with the way things were going, but they had become convinced that the Z80 design would not be approved. This, too, was consistent with the TI culture. If you were dissatisfied, you did something about it. And if your superior liked what you had done, there was a good chance that it would be adopted.

The engineers' new design kept the TMS9900 microprocessor (there was not any getting around that) and the main circuitry of the machine, but changed the way the computer looked. Now the computer had a typewriter keyboard. The keyboard had also been separated from the screen so that the screen became optional. (The keyboard could be attached to a television set). They also drew up proposals for cutting down the number of chips needed to run the computer, which had the effect of dramatically cutting costs.

When Bynum came on board, he became a champion of the new design, and it breezed past the corporate hierarchy in Dallas. By summer 1981, after months of working up prototypes, getting the kinks out of the system, and passing the various radiation tests mandated by the Federal Communications Commission, the TI99/4A was ready. The basic cost of the computer to the retailer was $340, and the price to the consumer, without peripherals, was going to be $550. Don Bynum had done his job. But would it sell?

The hard part about selling a home computer is that, unlike a personal computer, it has no immediately recognisable purpose. The Texas Instruments TI99/4A, four or five times less expensive than an average small business computer, was also considerably less powerful. It had 16K of memory, for instance, whereas most small business computers had 64K of memory. That meant that you could play computer games on the TI99/4A, or run some educational programs, or learn, in a limited way, the computer language. And you might be able to do a few basic tasks, like balance your checkbook. But to do anything more substantial, you had to invest several thousand dollars in peripherals. Was a home computer an appliance or was it a toy? Was it the beginning of the electronic future or was it the hula hoop of the 1980's? Why did you need one anyway? The man whose job it was to answer those questions at TI was William J. Turner, 36, and he was that rarest of birds at Texas Instruments, an outsider. He had been hired away from Digital Equipment Corporation in May 1980 and had been named marketing manager for TI's consumer products group. Although he had a degree in mathematics, he had obtained his job precisely because he was not an engineer. Turner had spent his career marketing computers.

He brought to the home computer division something it had not had before, a sales mentality. Bill Turner was gung ho about whatever product he was selling, upbeat and enthusiastic no matter what the actual state of affairs. He was great with numbers and projections. In meetings, he always had a chart that proved beyond all doubt that the home computer was about to turn the corner. His optimism had a lot to do with the early success of the TI99/4A, and with its ultimate failure.

He came to his job with two crucial theories. First, he believed that you could not sell a home computer in a computer store. Computer stores were meant for people who already knew something about computers or who were serious enough about them to spend several thousand dollars on one.

Turner wanted to get the TI99/4A placed in the kind of retail stores that already carried the company's pocket calculator, stores like J.C. Penney and Sears and Montgomery Ward. From the day he walked in the door, Turner spent much of his time building up this retail network, and he was good at it. Every month he would report new successes. Toys R Us had signed up; K Mart had signed up; even 7 Eleven was on the verge of signing up before the roof fell in at TI.

Turner's second theory was that the price of the TI99/4A had to be a lot lower. If the price was low enough, it would not matter that the home computer was more toy than tool. People would by it on a lark. Bill Turner wanted to sell price, and that became the cornerstone of his marketing strategy.

So in the months after the TI99/4A was introduced, Turner began bringing the list price of the TI99/4A down; from $550 to $450 to $375. He did this partly by making what seemed to be outrageous volume projections and then hustling up new retail outlets to absorb that volume. He also pushed Bynum's engineers to find ways

to lower the cost of the machine, by simplifying the design, eliminating chips, and so on. That way the profit margin on each computer remained steady, 40%, while the price went down.

With each new round of cutting costs, the engineers became increasingly unhappy with Turner, for they felt he was pushing them to do too much, too fast. But no one could argue with the results. TI had once produced fewer than 8,000 TI99/4s a month; it was now producing that many TI99/4As in a week. That was not enough for the consumer products group, with its large overhead and R&D budget, to turn a profit, but it was more than enough to make people believe Turner when he pulled out his latest chart and said the TI99/4A was about to take off.

By then, however, Texas Instruments was not the only company in the home computer business. Atari, the video game maker, had a computer out for some time that was under $1,000, the Atari 400. Several toy companies, particularly Mattel and Coleco, were trying to get out of video game consoles (which would not have a chance if home computers really hit) and into home computers.

Timex had a home computer in development, which it hoped would establish an entirely new market, the under $100 computer. And then there was Commodore. Nine months after TI put the TI99/4A on America's retail shelves, the Commodore Corporation introduced its first home computer. It was called the VIC20, and it came on the market at $299.

Talk to anyone who ever worked on the TI99/4A, and you will get the same story. Commodore's VIC20 could not compare with the TI99/4A. It was true. While the TI99/4A did not measure up to the more expensive small business computers, it looked spectacular next to the VIC20.

The VIC20 had a measly 4K of memory, while the TI99/4A had 16K with the 16 bit TMS9900. The VIC20 had only about 40 chips in its entire system; the TI99/4 had 60. There was no question that the TI computer was a far more powerful, far more sophisticated system. The TI99/4A's advantages, however, did not necessarily translate into sales. The computer business did not work that way anymore and had not for some time, and nobody understood that better than Jack Tramiel, the president of Commodore.

Although he has recently resigned from his position, Tramiel remains a near mythic figure in the computer business. He has a reputation as a tough, driven entrepreneur who, through shrewd dealing and brilliant marketing, single handedly built Commodore into a major force in the computer business.

When Tramiel set out to conquer the home computer market, he knew as well as anyone that the VIC20 was not a match for the TI99/4A except on the basis of price. Once before, Commodore had put out a product in a market where its chief competitor was TI, a line of digital watches. TI started a price war and drove Commodore out of the market. Tramiel was not about to let that happen again. No matter how low the TI99/4A went in price, Tramiel's machine could go lower. It simply cost less to build.

In retrospect, the great mistake Turner made was in creating a marketing strategy for the TI99/4A that lived and died on price alone. He could have promoted the TI99/4A's superiority to the VIC20 and justified a higher price on that basis. He could have tried harder to answer the question of why consumers needed to buy his home computer.

It is not just in retrospect that this is obvious; it should have been clear at the time. As soon as the VIC20 came on the market, some Texas Instruments' engineers took it apart and analysed its insides. They poked fun at what they found, but it was apparent that it was cheaper to make. The VIC20's cost advantages was not a deep, dark secret.

Yet Turner refused to change strategies. He will not say why (Turner would not be interviewed for this story), but people who worked under him say that it had to do with ambition, both Turner's and Texas Instruments'. Turner wanted the TI99/4A to dominate the market, and that was the kind of ambition that was fostered at Texas Instruments. The only way to do that was to go head to head with his toughest competitor, Commodore. Turner wanted a price war with the VIC20.

He could not, however, start a price war by himself. Although chief operating officer Bucy and chief executive officer Shepherd gave wide latitude to successful division heads, Turner was not yet a division head. He was on the same level as engineer Bynum, who ran the home computer division. Still answerable to a chain of command, in the tug of war between his desire and the desires of Bynum's engineers, Turner lost as many as he won. The engineers would surely go to the mat if he tried to drop the price of the TI99/4A to match that of the VIC20.

TI's corporate culture had always held that the best way to sell a product was to build a good product. So between April and August 1982, Turner had to be satisfied with fighting the war on other fronts. He hired Bill Cosby to be the television spokesman for the Texas Instruments home computer and paid him $1 million a year to do TV advertisements for the TI99/4A.

But Commodore's advertisements for the VIC20 were more clever and were aimed at kids rather than parents. Turner continued to add to the network of retailers selling the TI99/4A, but Commodore was with him at every step and quite often a step ahead of him.

Any why not? Most customers did not know the difference between 8 bits and 16 bits. Neither did most of the people working in the stores. Texas Instruments was doing nothing to explain the difference. All the customer knew was that two computers were sitting side by side on a shelf and one, the TI99/4A, cost $300 and the other, the VIC20, less than $250.

In August 1982, Turner got a major promotion, and a chance to take matters into his own hands. He was named president of the consumer products group. Engineer Don Bynum, who opposed the price war when he ran the home computer division, was also promoted, but Turner and Bynum were no longer equals. Turner was the best.

From previous discussions with the engineers, Turner knew that it would take at least a year to design a new computer that would undercut the VIC20. He did not want to wait that long, so he decided to go after the VIC20 with the product he already had. If the volume could keep finding cost reductions .., if the engineers broke right .., maybe they could pull it off. Maybe it would be a repeat of the Commodore TI battle over digital watches. On September 1 1982, at a time when the TI99/4A was selling for about $300 and the VIC20 for $250, Texas Instruments announced a rebate for the computer that effectively lowered the price to $199. This time there was no cost cutting by the engineers to match the price cut. The profit margin on the TI99/4A was halved, but Turner was not worried about that. That same day Commodore dropped the price of its machine $40 to match TI's. The price war was on.

For the next four months, Turner's price strategy worked like a charm. Fall and winter 1982, were Turner's time of triumph, for in those months the TI99/4A became the machine TI had always wanted it to be, a computer the average American would buy. Almost as soon as the price cut was announced, sales rocketed. Turner was suddenly a corporate superstar at TI, the marketing man genius, the outsider who had shown the engineers how to sell a computer. He had the numbers to back him up. The assembly lines were churning out 150,000 computers a month, and because of that enormous volume, the personal computer division turned out its first sustained profits. The retail network now had

some 12,000 stores; the TI99/4A was outselling the VIC20 three to one; and a $20 million business had become overnight, a $200 million business.

By the end of 1982, the TI99/4A was the top home computer in the United States and the entire staff was "on a high" as one engineer remembers it. They were heroes. When the home computer people went to Dallas for meetings, TI colleagues would come up to them and tell them how great it was that the TI99/4A was such a success. When 1982 was over, the home computer division had, in the words of one former employee, "zero retail inventory", which is to say, you could not find a TI99/4A anywhere in the country. They were sold out.

With things going so well for the TI99/4A, Turner and the consumer products group made their next big mistake. They got greedy. Timex had a dinky computer on the market that cost about $100; it was not much, but it was selling, and Turner decided to go after it. He had Bynum pull together some engineers, and they undertook a crash program to develop a competitive product to be called the 99/2. Several other computers were competing in the $500 to $1000 price range, and TI had long been developing a computer for that market; the 99/8, known by the code name "Armadillo". Commodore was developing a computer for the same market, which became the enormously successful Commodore 64. It was partly good marketing strategy to come in behind the original computer with a more advanced computer like the 99/8; that is the way markets evolved. But who cared if Timex was selling some $100 computer that could not do much? Was that really the direction in which the market was going? It seemed that Turner and Texas Instruments simply wanted it all.

That same attitude was evident in TI's stance toward third party software vendors. Before the price war, Texas Instruments had finally modified its policy toward independent software writers, largely at the urging of Don Bynum. It was obvious that TI's refusal to allow independents to write programs for the TI99/4A was hurting the company. Everybody else was doing the opposite. Even IBM, a company every bit as secretive and closed as TI had "opened the architecture", that is allowed software writers to see how the machine was built, before it came on the market. Hundreds of people were writing software for Apple computers, and the huge array of software generated by these third party vendors had become a key sales asset. The VIC20 also had an open architecture and the result was that it had many more games, for instance, than the TI99/4A.

Texas Instruments could never bring itself to open the architecture, but in the summer of 1982, it did give its tacit blessing to several former TI engineers who started their own software companies. Two companies were formed with the purpose of writing software for the TI99/4A, and one of them had a contract with Texas Instruments ensuring that it would not have to worry about a patent infringement suit from TI. When sales of the TI99/4A began to boom, the clamps went back on. TI took out advertisements in trade publications that threatened lawsuits against any company that wrote software for the TI99/4A without being licensed by TI. Any company that wanted to write for the TI99/4A had to do it on TI's terms, meaning that TI got to keep all but 10 percent of the profits.

In the software industry, much anger and resentment greeted the tougher policy, and a consensus developed that Texas Instruments had gone mad in its quests for profits. The truth was that TI needed those software profits over the long haul.

With the price war on, the company was not making very much on the computer itself and it was conceivable that if the price continued to drop there would be no profit on the machine at all. But for now Turner was not worried, and neither were his superiors.

Early in January 1983, Turner, Bynum, and some other people from the consumer products group went to Las Vegas for the semiannual Consumer Electronics Show. The CES is to home computers what the Paris Air Show is to aeroplanes. It is a place to do a little business, but more than that, it is a place to see what the competition has been up to and to snoop out new trends, trade war stories, and strut your company's stuff.

TI's extraordinary fall and winter had brought forth from Bill Turner optimistic forecasts for the future. According to his projections, 1983 would be the year of the home computer. Nearly seven million would be sold that year, he predicted, more than triple the two million sold in 1982. And of that seven million, he estimated, promised actually, that three million would be sold by Texas Instruments (whereas about 500,000 had been sold in 1982). Most analysts thought those figures were way too high; they were predicting sales in the area of four million. But Turner was undeterred. The home computer revolution had begun, he said, and TI was about to take over the market. The analysts, on the other hand, said that with the price so low and the machines so limited, most people thought of the home computer as a toy, which meant that sales would always peak in the months before Christmas. To them, that timing had as much to do with TI's success in late 1982 as the price war did. Turner, in contrast, was predicting that every month from now on was going to be about twice as good as December 1982, the best month ever for the TI99/4A. With chief operating officer Mark Shepherd in tow, he was going full steam ahead.

The Consumer Electronics Show in January seemed only to confirm Turner's inflated sense of the market. For the week of the show, the TI booth was overrun with people. Everybody wanted a piece of the TI99/4A. Bill Turner got enough orders at the show from retailers that when he came back to Texas he told Bucy and Shepherd that the first six months of 1983 were "already in the bag".

On the last day of the show, the TI crew went out on the town and wound up in a Las Vegas bar, where they started drinking Tequila. They talked about the show and the products and how it looked like there was nothing on the horizon that might stop the TI99/4A or the 99/8 and the 99/2 when they were ready. "Some guy from Apple told me they have sold 200,000 computers in schools", one man said. "I told him we put out more than that in a month". Everybody roared. The drinking produced an exaggerated sense of pride and accomplishment and even invincibility, and late that night, as they staggered from the bar, Don Bynum jumped on top of his rental car, raised his arms to the heavens, and gave one of his General Patton speeches. At that moment, he was king of the hill.

That night's jubilation was the pride that went before the fall, for the fall came very, very quickly. In January, Commodore cut the price of the VIC20 to $125; a few weeks later TI was forced to follow suit. The inevitable had happened. The TI99/4A was no longer making a profit, it was merely breaking even. But there were plenty of orders from retailers, much of it on backlog since Christmas, so Turner kept pushing the computers out. In February, a serious snag developed, the sort of thing that happens all the time to computer makers. TI discovered that a transformer bought from an outside company was faulty. Even though the transformer had passed the US government's safety tests, it failed a Canadian test, and although TI did not have to, it decided to replace the part. It ordered stores to stop selling the TI99/4A and then sent TI employees out to retail outlets across the country to fix the faulty part. At the company's annual meeting in April, Bucy announced that the problem had cost $50 million and had erased the profit that the computer had made the previous quarter.

Still, for each of the first three months of 1983, orders were up, largely because Turner kept expanding the retail network. At the annual meeting, Bucy announced proudly that Texas Instruments had shipped out its millionth home computer. But shipping was not the same as selling. By finding more and more stores that would carry the computer, Turner could keep production high without worrying about what was

happening once the computer got into the stores. TI's obsession with expanding the retail network had become a shell game, a delusion, for it left out the one thing that truly mattered. Were people actually buying the computers? The answer, as soon became clear, was no.

On April 4, Commodore cut the price of the VIC20 to $99, thus putting Turner in an untenable position. It cost more than $99 to manufacture the TI99/4A. He stalled for time, announcing that TI would offer a new rebate on the home computer by June. But it was not good enough. Now the VIC20 was back where it had been before the price war began sitting next to the TI99/4A on retail shelves, costing much less. At the same time, with the VIC20 so inexpensive, the market for the Timex product dried up completely.

Texas Instruments quietly cancelled the 99/2, the machine that was supposed to compete with Timex, before it ever came out. People in the consumer products group were beginning to see the writing on the wall. At the end of March, Don Bynum was reassigned to TI's Dallas headquarters. Running TI's $200 million computer business had become a manager's job and Bynum thought of himself as an engineer. Also, the pressures, particularly the transformer problem, had taken a toll on his health, and his doctor told him he needed to find another job. Before he left Lubbock, Bynum sat down one last time with Bill Turner, and they went over the numbers. Turner had not changed a bit. Yes, things had been tough, he told Bynum, but it was still going to be a great year. The transformer problem was behind them now, the retail base was still strong. Why just that month Turner had added the Sears stores to the network. With just a few readjustments, they could still sell three million computers. He was just as gung ho and as persuasive as he had ever been. Bynum left that meeting half believing that Turner could pull it off.

But of course he could not, not with a machine that could never make a profit even if it did sell. In late April, the numbers caught up with him. Because the consumer products group was adhering to Turner's forecast, the TI assembly lines kept pushing out computers as fast as they could. But now computers began coming back to TI. Just because a retailer had a machine on the shelves did not mean he had actually bought it. He had the right to return it. "Sales" that had been posted by Turner were revised and lowered. It was not going to be December all year round. Turner's optimistic projections were crashing down around him.

Bucy and Shepherd received the stunning news that despite everything they had been told, all was not well with the home computer division. That they had not known before was not so surprising, given the company's culture. It left the winners alone; but it did not spend much time coddling losers, and that is what Bill Turner had become at TI. They brought in another manager, Jerry Junkins, to run the show and Turner left the company a few months later.

By the beginning of May, it was back to the old ways. Junkins was a long time TI employee and a highly regarded manager, but he came from the company's government sector and had no consumer experience. Nonetheless, his mission was to stem the flow of red ink as best he could. In June, in an effort to get the computer moving again, he matched the VIC20's $99 price. He revised the projections and began shutting down assembly lines and laying off workers. Plans were drawn to redesign the computer and get the costs down, so it could be profitable again.

But nothing helped. Home computer sales of both the VIC20 and the TI99/4A were sluggish, although for Commodore that was not so bad. It had begun phasing out the VIC20 by then, and its new product, a more expensive, more powerful Commodore 64, was entering the marketplace to take up where the VIC20 had left off.

Junkins was not the only new face in the consumer products group. In the management reshuffle that took place, half a dozen new people were brought in and J. Fred Bucy himself took charge of the home computer operation. He began making regular trips to Lubbock, asking pointed questions of the engineers. "We have made a mistake", he would say in meetings, "and we have 30 days to turn it around." Bucy scrapped Bill Cosby, and instead instituted a series of advertisements that stressed the educational value of a home computer. After all, that is how Commodore was selling its 64.

But there was really nothing that could be done quickly. The mistakes were too big and they had been allowed to go on too long. By the second quarter of 1983, anyone who followed American business knew the TI99/4A home computer was in danger. It was then that Shepherd and Bucy announced that the company had lost $119 million that quarter because of the home computer.

There was one final hope; the 99/8, TI's higher priced, higher performance computer. If the 99/8 did well, it could keep the home computer division in business as the TI99/4As were phased out. But at the 1983 summer electronics show, even that hope was dashed. TI brought the 99/8 to the show, ostensibly to unveil it, but kept it behind a locked door for the entire show. It was embarrassing. Some of the trade papers even published photographs of the door. No one at Texas Instruments would say why, but TI did not seem to think the machine would stack up against the rash of new computers aimed at that market. Coleco had announced Adam, a $600 home computer that included peripherals like disk drives and a printer. The price of the Commodore 64 was coming down. Apple was supposedly working on a home computer. IBM was getting ready to enter the home computer market with a machine called the PCjr. After the show, there were meetings to discuss the future of the 99/8, and at the last of them, Fred Bucy got in front of everyone and said, "I do not think this product can make any money. Does anyone disagree?" No one did. The 99/8 was dead.

Pulling the plug on the home computer three months later was an act of mercy. It put the home computer division out of its misery. Could the situation have been turned around eventually? Possibly. But it would have taken new products and new approaches in the marketplace. And most of all, it would have taken time, which TI did not think it could afford. The stock was dropping because analysts had become so soured on the TI99/4A. The losses were continuing to mount; in the third quarter TI took a $300 million bath. When Bucy and Shepherd looked into the tunnel, they could see no light.

The collapse of the TI99/4A did not take Texas Instruments completely out of the computer business. In early 1983, the data systems group, in Austin, put out a TI Professional computer that sells for close to $3,000 and some months later the same division introduced a portable business computer for about the same price. But the TI Professional is competing in a market that since then has come to be dominated by the IBM Personal Computer and nothing TI does is going to change that. The IBM PC has become the de facto standard in the industry, and the lion's share of the market from now on will always belong to IBM and to competitors that are "IBM compatible". The TI Professional is not IBM compatible.

What the future holds for the TI Professional depends a lot on what aspirations TI has for the machine. If the company were content to cede the marketplace to IBM and if it were willing to sell 50,000 computers a year while IBM sells 500,000, then the TI Professional will probably be a success, albeit a limited one. But if TI decides that it has to go head to head with IBM, then the TI Professional, like the home computer before it, is a disaster waiting to happen.

So far, Texas Instruments seems to have learned at least some lessons from its disaster. When the Professional was first envisioned, the consumer products group backed by Bucy, made a strong play for having the machine produced in Lubbock. But the consumer group lost that battle. The machine

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Questprobe, featuring Spiderman

Part 3, Hints and solutions
by Larry Saunders

PROBLEM WITH MADAM WEB??
39 41 130 106
More help for above problem.
44 73 198 196
Solution to above problem.
39 41 153 112 4 105 90 161 95 103 92
SANDMAN A PROBLEM??
103 198 196
More help for above problem.
212 119 189 112 51 93
Solution to above problem.
211 41 191 24 73 102

SANDMAN STILL A PROBLEM??
151 191 126 121
More help for above problem.
5 16
Solution to above problem.
12 80 68 12 118 102 89 112 36 179 102 144
LIZARD A PROBLEM??
151 191 199 121 165
More help for above problem.
198 196
Solution to above problem.
162 41 130 111 215

HYDROMAN A PROBLEM??
179 102 62
More help for above problem.
76 85 131 62
Solution to the above problem.
59 183 180
BIO GEM A PROBLEM??
151 191 76 63 162
More help for above problem.
222 194 34 97 162 125
Solution to above problem.
59 163 180

ELEVATOR A PROBLEM??
162 41 25
More help for above problem.
162 4 191 176 136 33 95 37 211
Solution to above problem.
113 31
ELEVATOR STILL A PROBLEM??
36 118 102 71 134
More help for above problem.
95 37 211
Solution to above problem.
12 118 102 134

MYSTERIO A PROBLEM??
13 41 102 208 225 109 155 123
More help for above problem.
209 37 55 102 7 101 133 47 78
Solution to above problem.
50 196 23 105 121 161 95
MYSTERIO STILL A PROBLEM??
67 156 37 95 53 93 36 136 112 81 112 227 88 162
More help for above problem.
57 29
Solution to above problem.
36 27

MYSTERIO STILL A PROBLEM??
12 73 121
More help for above problem.
26 115 1 114
Solution to above problem.
22

FALLING BUT NOT LANDING??
78 164
More help for above problem.
185 10
Solution to above problem.
213 192 222 98

STILL HAVE NOT FOUND A LARGE FAN??
95 37 191 190 95 227
More help for above problem.
95 37 172 179 102 148 83 192 70
Solution to above problem.
22 136 178 53 221 225 148
CAN NOT GO ALL THE WAY UP THE ELEVATOR??
217 150 135 30 95
More help for above problem.
36 136 112 185 95 37 211
Solution to the above problem.
56 136 112 68 12 136

CAN NOT SPIN A WEB??
26 196 170
More help for above problem.
155 77 28
Solution to the above problem.
140 129 112 48 37 53 3 156
STILL CAN NOT SPIN A WEB??
215 41 179 102 28
More help for above problem.
162 41 53 130 188 225 127 128 41 65
Solution to above problem.
36 220

STILL MISSING FORMULA??
76 220
More help for above problem.
36 220
Solution to above problem
143 186
FAN A PROBLEM??
43 162
More help for above problem.
54 162
Solution to above problem.
40 201 83 162 36 83 162

MAZE A PROBLEM??
198 196
More help for above problem.
135 37 166 46
Solution to above problem.
12 141 136 69 81 179 162
ELECTRO A PROBLEM??
157 22 52
More help for above problem.
147 210 117 37 139 225 45
Solution to above problem.
149 147 210 117 174 84 226

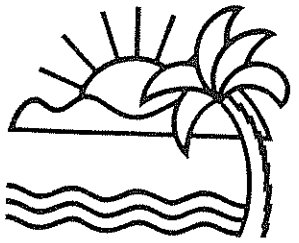
PRESSES A PROBLEM??
14
More help for above problem.
146 218
Solution to the above problem.
12 73 102 49 129
RINGMASTER A PROBLEM??
19 76 222 132
More help for above problem.
44 73 14
Solution to above problem.
58 87 168 102 89 68 56 102 18 112 169 162

LIZARD A PROBLEM??
198 196 23 105 121
More help for above problem.
95 23 26 102 111 175
Solution to above problem.
179 140 129 26 120 223 131 120 108 112 182 68 40
162 53 74 68 57 121
HYDROMAN A PROBLEM??
13 41 139 225 122 185 135 198 196 181
More help for above problem.
28
Solution to above problem
200 137 60 162 41 77 219 8

BIO GEM A PROBLEM??
36 202 131 42
More help for above problem.
138 95 23 15 213 205 225 38 99
Solution to above problem.
9 196 83 195 85 131 42

continued on page 20

```
 10 REM*********************
 20 REM***                 ***
 30 REM*** MAGIC SQUARES***
 40 REM***                 ***
 50 REM*********************
 60 GOSUB 110
 70 GOSUB 340
 80 GOSUB 890
 90 GOSUB 1540
100 END
110 REM
120 REM***INSTRUCTIONS***
130 REM
140 GOSUB 300
150 PRINT "IN THIS GAME YOU
HAVE A     FOUR BY FOUR GAME
BOARD THAT CONTAINS THE LETT
ERS A-O."
160 PRINT
170 PRINT "THE OBJECT IS TO
HORIZONTAL-LY ALPHABETIZE TH
E SCRAMBLEDLETTERS.  YOU CAN
 MOVE A"
180 PRINT "PIECE SIDEWAYS OR
 UP AND    DOWN, AS LONG AS
THE EMPTY  SQUARE IS NEXT TO
 IT."
190 PRINT
200 PRINT "THE KEY IS TO THI
NK AHEAD!"
210 PRINT
220 PRINT "YOU WILL BE SHOWN
 AN ALPHA- BETIZED GAMEBOARD
 BEFORE    THE SCRAMBLING TA
KES PLACE."
230 PRINT
240 PRINT "TO QUIT THE GAME,
 ENTER Q."
250 FOR I=1 TO 2
260 PRINT
270 NEXT I
280 INPUT "PRESS ENTER WHEN
READY TO   CONTINUE: ":ANS$
290 RETURN
300 CALL CLEAR
310 PRINT TAB(5);"*** MAGIC
SQUARES ***"
320 PRINT
330 RETURN
340 REM
350 REM***SETUP***
360 REM
370 CALL CLEAR
380 RANDOMIZE
390 DIM GB(5,5),M1(26)
400 CALL COLOR(9,5,5)
410 CALL COLOR(10,3,3)
420 REM DRAW GAMEBOARD
430 PRINT "TYPE THE LETTER Y
OU WISH TO MOVE.  TYPE Q TO
QUIT."
440 FOR X=5 TO 13
450 CALL HCHAR(X,14,96,9)
460 NEXT X
470 FOR X=2 TO 8 STEP 2
480 FOR Y=2 TO 8 STEP 2
490 A=A+1
500 IF A=16 THEN 520
510 CALL HCHAR(4+X,13+Y,64+A
)
520 NEXT Y
530 NEXT X
540 CALL HCHAR(12,21,32)
550 A=0
560 FOR I=1 TO 4
570 FOR J=1 TO 4
580 A=A+1
590 GB(I,J)=64+A
600 NEXT J
610 NEXT I
620 GB(4,4)=32
630 REM SCRAMBLE THE BOARD
640 FOR I=1 TO 4
650 FOR J=1 TO 4
660 X=INT(RND*4)+1
670 Y=INT(RND*4)+1
680 T=GB(I,J)
690 GB(I,J)=GB(X,Y)
700 GB(X,Y)=T
710 NEXT J
720 NEXT I
730 FOR I=1 TO 4
740 FOR J=1 TO 4
750 CALL HCHAR(4+2*I,13+2*J,
GB(I,J))
760 NEXT J
770 NEXT I
780 MM1$="THAT LETTER CAN'T
BE MOVED"
790 FOR I=1 TO 26
800 M1(I)=ASC(SEG$(MM1$,I,1)
)
810 NEXT I
820 FOR I=0 TO 5 STEP 5
830 FOR J=1 TO 4
840 GB(I,J)=99
850 GB(J,I)=99
860 NEXT J
870 NEXT I
880 RETURN
890 REM
900 REM***PLAY***
910 REM
920 CALL KEY(0,N,T)
930 IF T=0 THEN 920
940 IF N=81 THEN 1530
950 IF (N<65)+(N>79)THEN 920
960 X1=1
970 Y1=1
980 IF GB(X1,Y1)=32 THEN 103
0
990 Y1=Y1+1
1000 IF Y1<5 THEN 980
1010 X1=X1+1
1020 GOTO 970
1030 IF GB(X1+1,Y1)<>N THEN
1090
1040 T=GB(X1+1,Y1)
1050 GB(X1+1,Y1)=32
1060 GB(X1,Y1)=T
1070 CX=1
1080 GOTO 1260
1090 IF GB(X1-1,Y1)<>N THEN
1150
1100 T=GB(X1-1,Y1)
1110 GB(X1-1,Y1)=32
1120 GB(X1,Y1)=T
1130 CX=-1
1140 GOTO 1260
1150 IF GB(X1,Y1+1)<>N THEN
1210
1160 T=GB(X1,Y1+1)
1170 GB(X1,Y1+1)=32
1180 GB(X1,Y1)=T
1190 CY=1
1200 GOTO 1260
1210 IF GB(X1,Y1-1)<>N THEN
1410
1220 T=GB(X1,Y1-1)
1230 GB(X1,Y1-1)=32
1240 GB(X1,Y1)=T
1250 CY=-1
1260 CALL HCHAR(4+2*X1,13+2*
Y1,GB(X1,Y1))
1270 CALL HCHAR(4+2*(X1+CX),
13+2*(Y1+CY),GB(X1+CX,Y1+CY)
)
1280 CX=0
1290 CY=0
1300 A=0
1310 FOR I=1 TO 4
1320 FOR J=1 TO 4
1330 IF GB(I,J)<>65+A THEN 1
350
1340 TC=TC+1
1350 A=A+1
1360 NEXT J
1370 NEXT I
1380 IF (TC=15)*(GB(4,4)=32)
THEN 1500
1390 TC=0
1400 GOTO 920
1410 FOR I=1 TO 26
1420 CALL HCHAR(20,I+2,M1(I)
)
1430 NEXT I
1440 FOR I=1 TO 100
1450 NEXT I
1460 FOR I=1 TO 26
1470 CALL HCHAR(20,I+2,32)
1480 NEXT I
1490 GOTO 920
1500 W=1
1510 FOR I=1 TO 400
1520 NEXT I
1530 RETURN
1540 REM
1550 REM***END***
1560 REM
1570 CALL CLEAR
1580 IF W<>1 THEN 1650
1590 PRINT TAB(9);"YOU DID I
T!!!"
1600 FOR I=1 TO 12
1610 PRINT
1620 NEXT I
1630 PRINT "YOU HAVE DISPLAY
ED BRAINS,  SKILL, AND FORTI
TUDE!!"
1640 GOTO 1690
1650 PRINT "SORRY YOU HAD TO
 QUIT EARLY.BETTER LUCK NEXT
 TIME."
1660 FOR I=1 TO 12
1670 PRINT
1680 NEXT I
1690 RETURN
```



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```
4450 IF (STAT2=0)+(STAT2=-1)
THEN 4440
4460 CALL HCHAR(24,18,R)
4470 R=R-48
4480 R=R*.1
4490 KEY=L+R
4500 FOR I=1 TO 100
4510 NEXT I
4520 RETURN
4530 REM
4540 REM ***END***
4550 REM
4560 GOSUB 450
4570 FOR I=1 TO 8
4580 PRINT
4590 CALL SOUND(200,I*110,2)
4600 NEXT I
4610 PRINT "THE GAME IS OVER
!!!"
4620 PRINT
4630 PRINT "ON THE PAR 27 CO
URSE, YOU   SHOT A ROUND OF
";SC
4640 PRINT
4650 PRINT "THAT IS AN AVERA
GE OF";SC/9;"SHOTS PER HOLE.
"
4660 PRINT
4670 PRINT "HOPE YOU ENJOYED
 THE GAME!!!"
4680 RETURN
```

```
10 REM ********************
20 REM ***                  ***
30 REM ***MINIATURE GOLF***
40 REM ***                  ***
50 REM ********************
60 GOSUB 110
70 GOSUB 490
80 GOSUB 2350
90 GOSUB 4530
100 END
110 REM
120 REM ***INSTRUCTIONS***
130 REM
140 CALL SCREEN(14)
150 GOSUB 450
160 PRINT "WELCOME!! WE HOPE
 YOU ENJOY YOUR MINIATURE GO
LF GAME."
170 PRINT
180 PRINT "TO PUTT THE BALL,
 YOU HAVE  TO ENTER WHICH DI
RECTION YOUWANT TO AIM IT.
THE EIGHT"
190 PRINT "DIRECTIONS ARE SH
OWN BELOW."
200 PRINT "YOUR BALL IS ASSU
MED TO BE  AT * :"
210 PRINT TAB(13);"2 1 8"
220 PRINT TAB(13);"3 * 7"
230 PRINT TAB(13);"4 5 6"
240 PRINT
250 PRINT
260 PRINT "THEN YOU MUST ENT
ER HOW HARDTO HIT THE BALL.
 THE SPEED SHOULD BE A NUMBE
R BETWEEN"
270 PRINT "0.0 AND 5.0"
280 PRINT
290 GOSUB 420
300 GOSUB 450
310 PRINT "THERE ARE HAZARDS
:"
320 PRINT
330 PRINT "BLOCKS-PURPLE, YO
U MUST GO  AROUND THESE"
340 PRINT
350 PRINT "SAND-YELLOW, YOU
CANNOT PASSTHROUGH, PENALTY=
1 STROKE."
360 PRINT
370 PRINT "WATER-BLUE, LIKE
SAND,      WILL SLOW AND STO
P BALL,    PENALTY=1 STROKE.
"
380 PRINT
390 PRINT "UNEVEN-LIGHT BLUE
, WILL     CHANGE DIRECTION
OF BALL    RANDOMLY, NO PENA
LTY."
400 PRINT
410 PRINT "IF THE BALL IS HI
T TOO HARD,IT WILL GO PAST T
HE HOLE ANDKEEP ROLLING."
420 PRINT
430 INPUT "PRESS ENTER WHEN
READY TO   CONTINUE: ":ANS$
440 RETURN
450 CALL CLEAR
460 PRINT TAB(4);"*** MINIAT
URE GOLF ***"
470 PRINT
480 RETURN
490 REM
500 REM ***SETUP***
510 REM
520 CALL CLEAR
530 CALL SCREEN(3)
540 RANDOMIZE
550 EF$="3C7EFFFFFFFF7E3C"
560 FF$="FFFFFFFFFFFFFFFF"
570 CALL CHAR(104,FF$)
580 CALL CHAR(112,FF$)
590 CALL CHAR(120,FF$)
600 CALL CHAR(128,FF$)
610 CALL CHAR(136,EF$)
620 CALL CHAR(144,EF$)
630 CALL CHAR(152,FF$)
640 FOR I=9 TO 16
650 READ J
660 CALL COLOR(I,J,13)
670 NEXT I
680 DATA 9,3,5,14,11,16,9,8
690 DIM HA(9,5)
700 FOR I=1 TO 9
710 FOR J=1 TO 5
720 READ HA(I,J)
730 NEXT J
740 NEXT I
750 DATA 0,0,0,0,2
760 DATA 1,0,0,0,3
770 DATA 0,1,0,0,3
780 DATA 1,1,0,0,3
790 DATA 0,0,0,1,3
800 DATA 0,0,1,1,3
810 DATA 1,0,1,0,3
820 DATA 0,1,1,0,4
830 DATA 0,0,1,1,3
840 DIM DI(8,2)
850 FOR I=1 TO 8
860 READ DI(I,1)
870 READ DI(I,2)
880 NEXT I
890 DATA -1,0,-1,-1,0,-1,1,-
1,1,0,1,1,0,1,-1,1
900 RETURN
910 REM  HOLE 1
920 CALL HCHAR(2,8,120,20)
930 CALL HCHAR(20,8,120,20)
940 CALL VCHAR(2,8,120,18)
950 CALL VCHAR(2,27,120,18)
960 CALL HCHAR(5,17,144)
970 BY=15
980 BX=INT(RND*5)+15
990 CALL HCHAR(BX,BY,136)
1000 RETURN
1010 REM  HOLE 2
1020 CALL HCHAR(2,6,120,24)
1030 CALL HCHAR(20,6,120,14)
1040 CALL HCHAR(10,20,120,10
)
1050 CALL VCHAR(2,6,120,18)
1060 CALL VCHAR(2,29,120,8)
1070 CALL VCHAR(10,20,120,11
)
1080 CALL VCHAR(10,19,112,7)
1090 CALL VCHAR(11,18,112,4)
1100 CALL VCHAR(12,17,112,2)
1110 CALL VCHAR(12,16,112)
1120 CALL HCHAR(6,25,144)
1130 BY=10
1140 GOTO 980
1150 REM  HOLE 3
1160 CALL HCHAR(2,20,120,10)
1170 CALL HCHAR(9,4,120,17)
1180 CALL HCHAR(20,4,120,17)
1190 CALL HCHAR(16,20,120,11
)
1200 CALL VCHAR(9,4,120,11)
1210 CALL VCHAR(2,20,120,7)
1220 CALL VCHAR(2,30,120,15)
1230 CALL VCHAR(16,20,120,4)
1240 FOR I=1 TO 6
1250 CALL HCHAR(9+I,30-I,128
,I)
1260 NEXT I
1270 CALL HCHAR(5,25,144)
1280 BY=10
1290 GOTO 980
1300 REM  HOLE 4
1310 CALL HCHAR(2,4,120,27)
1320 CALL HCHAR(20,4,120,11)
1330 CALL HCHAR(10,14,120,8)
1340 CALL HCHAR(14,22,120,9)
1350 CALL VCHAR(2,4,120,18)
1360 CALL VCHAR(2,30,120,13)
1370 CALL VCHAR(10,14,120,11
)
1380 CALL VCHAR(10,22,120,5)
1390 CALL HCHAR(3,14,128,10)
1400 CALL HCHAR(4,15,128,7)
1410 CALL HCHAR(7,18,112)
1420 CALL HCHAR(8,15,112,6)
1430 CALL HCHAR(9,14,112,8)
1440 CALL HCHAR(11,26,144)
1450 BY=10
1460 GOTO 980
1470 REM  HOLE 5
1480 CALL HCHAR(2,5,120,23)
1490 CALL HCHAR(20,5,120,23)
1500 CALL HCHAR(8,8,120,18)
1510 CALL VCHAR(2,5,120,19)
1520 CALL VCHAR(2,28,120,19)
1530 CALL VCHAR(5,8,120,3)
1540 CALL VCHAR(5,25,120,3)
1550 CALL HCHAR(6,16,144)
1560 BY=17
1570 GOTO 980
1580 REM  HOLE 6
1590 CALL HCHAR(2,4,120,27)
1600 CALL HCHAR(20,4,120,16)
1610 CALL HCHAR(12,19,120,12
)
1620 CALL VCHAR(2,4,120,18)
1630 CALL VCHAR(2,30,120,11)
1640 CALL VCHAR(13,19,120,8)
1650 CALL HCHAR(5,21,120,6)
1660 CALL HCHAR(10,21,120,6)
1670 CALL VCHAR(5,21,120,6)
1680 FOR I=14 TO 18
1690 CALL VCHAR(9,I,152,7)
1700 NEXT I
1710 CALL VCHAR(10,19,152,2)
1720 CALL VCHAR(11,20,152)
1730 CALL HCHAR(8,27,144)
1740 BY=10
1750 GOTO 980
1760 REM  HOLE 7
1770 CALL HCHAR(2,4,120,12)
1780 CALL HCHAR(12,4,120,17)
1790 CALL HCHAR(6,15,120,16)
1800 CALL HCHAR(20,20,120,11
)
1810 CALL VCHAR(2,4,120,10)
1820 CALL VCHAR(2,15,120,4)
1830 CALL VCHAR(12,20,120,8)
1840 CALL VCHAR(6,30,120,14)
1850 FOR I=1 TO 6
1860 CALL HCHAR(5+I,5,112,I+
1)
1870 NEXT I
1880 CALL HCHAR(7,22,152,8)
1890 CALL HCHAR(8,22,152,8)
1900 FOR I=1 TO 8
1910 CALL HCHAR(8+I,27,152,3
)
1920 NEXT I
1930 CALL HCHAR(4,9,144)
1940 BY=24
1950 GOTO 980
1960 REM  HOLE 8
1970 CALL HCHAR(2,4,120,27)
1980 CALL HCHAR(15,4,120,10)
1990 CALL HCHAR(11,13,120,8)
2000 CALL HCHAR(20,21,120,10
)
2010 CALL VCHAR(2,4,120,14)
2020 CALL VCHAR(11,13,120,4)
2030 CALL VCHAR(11,21,120,10
)
2040 CALL VCHAR(2,30,120,18)
2050 CALL VCHAR(5,7,128,4)
2060 CALL VCHAR(6,8,128,5)
2070 CALL VCHAR(5,9,128,6)
2080 CALL VCHAR(5,10,128,4)
2090 CALL VCHAR(5,11,128,3)
2100 FOR I=22 TO 29
2110 READ J
2120 CALL VCHAR(3,I,152,J)
2130 NEXT I
2140 DATA 3,4,5,6,9,10,13,14
2150 CALL VCHAR(3,21,152)
2160 CALL VCHAR(14,27,152)
2170 CALL VCHAR(13,8,144)
2180 BY=25
2190 GOTO 980
```

```
2200 REM  HOLE 9
2210 CALL HCHAR(2,4,120,27)
2220 CALL HCHAR(11,4,120,16)
2230 CALL HCHAR(20,20,120,10
)
2240 CALL VCHAR(2,4,120,10)
2250 CALL VCHAR(2,30,120,19)
2260 CALL VCHAR(11,20,120,10
)
2270 CALL VCHAR(5,13,120,4)
2280 CALL HCHAR(5,8,120,5)
2290 FOR I=1 TO 9
2300 CALL HCHAR(2+I,20+I,152
,10-I)
2310 NEXT I
2320 CALL HCHAR(8,9,144)
2330 BY=25
2340 GOTO 980
2350 REM
2360 REM ***PLAY***
2370 REM
2380 FOR HO=1 TO 9
2390 CALL CLEAR
2400 BC=104
2410 ON HO GOSUB 910,1010,11
50,1300,1470,1580,1760,1960,
2200
2420 FOR I=1 TO 11
2430 CALL HCHAR(21,2+I,ASC(S
EG$("HOLE NUMBER",I,1)))
2440 NEXT I
2450 CALL HCHAR(21,15,ASC(ST
R$(HO)))
2460 FOR I=1 TO 3
2470 CALL HCHAR(22,5+I,ASC(S
EG$("PAR",I,1)))
2480 NEXT I
2490 CALL HCHAR(22,10,ASC(ST
R$(HA(HO,5))))
2500 FOR I=1 TO 6
2510 CALL HCHAR(23,2+I,ASC(S
EG$("TRAPS:",I,1)))
2520 NEXT I
2530 AMT=2
2540 I=1
2550 IF HA(HO,I)=0 THEN 2580
2560 AMT=AMT+7
2570 ON I GOSUB 4210,4260,42
80,4300
2580 I=I+1
2590 IF I<5 THEN 2550
2600 A$="DIRECTION (1-8):"
2610 GOSUB 2740
2620 CALL KEY(3,KEY,STAT)
2630 IF STAT=0 THEN 2620
2640 CALL HCHAR(24,19,KEY)
2650 FOR I=1 TO 100
2660 NEXT I
2670 KEY=KEY-48
2680 IF (KEY<1)+(KEY>8)+(KEY
<>INT(KEY))THEN 2690 ELSE 28
20
2690 CALL HCHAR(24,3,32,18)
2700 A$="THE DIRECTION IS FR
OM 1 TO 8"
2710 GOSUB 2740
2720 GOSUB 2780
2730 GOTO 2600
2740 FOR I=1 TO LEN(A$)
2750 CALL HCHAR(24,2+I,ASC(S
EG$(A$,I,1)))
2760 NEXT I
2770 RETURN
2780 FOR I=1 TO 500
2790 NEXT I
2800 CALL HCHAR(24,1,32,32)
2810 RETURN
2820 DIR=KEY
2830 CALL HCHAR(24,2,32,18)
2840 A$="SPEED (0-5):"
2850 GOSUB 2740
2860 GOSUB 4320
2870 IF (KEY<0)+(KEY>5)THEN
2880 ELSE 2930
2880 CALL HCHAR(24,2,32,18)
2890 A$="THE SPEED IS FROM 0
.0 TO 5.0"
2900 GOSUB 2740
2910 GOSUB 2780
2920 GOTO 2840
2930 CALL HCHAR(24,2,32,18)
2940 SP=KEY
2950 UF=0
2960 REM  CLEAR UNEVEN FLAG

2970 TF=0
2980 REM  CLEAR TRAP FLAG

2990 X2=BX+DI(DIR,1)
3000 Y2=BY+DI(DIR,2)
3010 CALL GCHAR(X2,Y2,CK)
3020 IF (CK=32)+(CK=104)THEN
 3030 ELSE 3060
3030 GOSUB 3740
3040 BC=104
3050 GOTO 4120
3060 IF CK=120 THEN 3110
3070 IF CK=112 THEN 3670
3080 IF CK=128 THEN 3800
3090 IF CK=152 THEN 3830
3100 IF CK=144 THEN 3940
3110 IF (DIR=1)+(DIR=3)THEN
3120 ELSE 3140
3120 DIR=DIR+4
3130 GOTO 2990
3140 IF (DIR=7)+(DIR=5)THEN
3150 ELSE 3170
3150 DIR=DIR-4
3160 GOTO 2990
3170 CALL GCHAR(X2+1,Y2,CK1)
3180 CALL GCHAR(X2,Y2+1,CK)
3190 CALL GCHAR(X2,Y2-1,CK3)
3200 CALL GCHAR(X2-1,Y2,CK2)
3210 ON DIR/2 GOTO 3220,3340
,3450,3560
3220 IF (CK=120)*(CK1=120)TH
EN 3240 ELSE 3260
3230 IF TF<=0 THEN 4150
3240 DIR=6
3250 GOTO 2990
3260 IF CK<>120 THEN 3290
3270 DIR=4
3280 GOTO 2990
3290 IF CK1<>120 THEN 3320
3300 DIR=8
3310 GOTO 2990
3320 DIR=6
3330 GOTO 2990
3340 IF (CK=120)*(CK2=120)TH
EN 3350 ELSE 3370
3350 DIR=8
3360 GOTO 2990
3370 IF CK<>120 THEN 3400
3380 DIR=2
3390 GOTO 2990
3400 IF CK2<>120 THEN 3430
3410 DIR=6
3420 GOTO 2990
3430 DIR=8
3440 GOTO 2990
3450 IF (CK3=120)*(CK2=120)T
HEN 3460 ELSE 3480
3460 DIR=2
3470 GOTO 2990
3480 IF CK3<>120 THEN 3510
3490 DIR=8
3500 GOTO 2990
3510 IF CK2<>120 THEN 3540
3520 DIR=4
3530 GOTO 2990
3540 DIR=2
3550 GOTO 2990
3560 IF (CK3=120)*(CK1=120)T
HEN 3570 ELSE 3590
3570 DIR=4
3580 GOTO 2990
3590 IF CK3<>120 THEN 3620
3600 DIR=6
3610 GOTO 2990
3620 IF CK1<>120 THEN 3650
3630 DIR=2
3640 GOTO 2990
3650 DIR=4
3660 GOTO 2990
3670 GOSUB 3700
3680 BC=112
3690 GOTO 4120
3700 IF TF THEN 3740
3710 TF=3
3720 SC=SC+1
3730 REM  TRAP FLAG
3740 CLR=BC
3750 CALL HCHAR(BX,BY,CLR)
3760 CALL HCHAR(X2,Y2,136)
3770 BX=X2
3780 BY=Y2
3790 RETURN
3800 GOSUB 3700
3810 BC=128
3820 GOTO 4120
3830 IF UF THEN 3910
3840 UF=1
3850 REM  UNEVEN FLAG
3860 DIR=DIR+INT(RND*2)*2-1
3870 IF DIR THEN 3890
3880 DIR=8
3890 IF DIR<>9 THEN 3910
3900 DIR=1
3910 GOSUB 3740
3920 BC=152
3930 GOTO 4120
3940 CALL HCHAR(BX,BY,104)
3950 CALL HCHAR(X2,Y2,136)
3960 CALL HCHAR(X2,Y2,144)
3970 DIR=DIR+INT(RND*2)*2-1
3980 IF DIR THEN 4000
3990 DIR=8
4000 SP=SP-.4
4010 IF SP<=0 THEN 4050
4020 X2=X2+DI(DIR,1)
4030 Y2=Y2+DI(DIR,2)
4040 GOTO 3010
4050 IF DIR<>9 THEN 4070
4060 DIR=1
4070 FOR I=1 TO 20
4080 CALL SOUND(50,1760,2)
4090 NEXT I
4100 SC=SC+1
4110 GOTO 4190
4120 CALL SOUND(50,1760,2)
4130 TF=TF-1
4140 IF TF=0 THEN 4170
4150 SP=SP-.2
4160 IF SP>0 THEN 2990
4170 SC=SC+1
4180 GOTO 2420
4190 NEXT HO
4200 RETURN
4210 H$="WATER"
4220 FOR I=1 TO LEN(H$)
4230 CALL HCHAR(23,AMT+I,ASC
(SEG$(H$,I,1)))
4240 NEXT I
4250 RETURN
4260 H$="SAND"
4270 GOTO 4220
4280 H$="UNEVEN"
4290 GOTO 4220
4300 H$="BLOCKS"
4310 GOTO 4220
4320 REM  SPEED
4330 CALL KEY(3,L,STAT)
4340 IF (STAT=0)+(STAT=-1)TH
EN 4330
4350 IF L<>46 THEN 4380
4360 L=0
4370 GOTO 4430
4380 CALL HCHAR(24,16,L)
4390 L=L-48
4400 CALL KEY(3,M,STAT1)
4410 IF (STAT1=0)+(STAT1=-1)
THEN 4400
4420 IF M=13 THEN 4490
4430 CALL HCHAR(24,17,46)
4440 CALL KEY(3,R,STAT2)
```

continued on page 14

PrEditor

by Larry Saunders

PrEditor Requirements:

To use PrEditor you will need the following equipment:
TI-99/4A
32K Memory expansion and a disk system

Additionally, PrEditor can make use of:
IN+8
RS232 and Printer
8K or 16K SuperCart
A Myarc 9640 (Geneve) or any 80 column card

Loading PrEditor

Extended BASIC: select Extended BASIC from main menu - a short menu will appear. Press 1 and the program will automatically load and run. Pressing 2 causes configure program to load and run (see the section Configuring PrEditor for more details on this).

Editor/assembler: Select option 5 - "RUN PROGRAM FILE" from the Editor/Assembler menu. Type the filename DSK1.PR and press ENTER. PrEditor will load and run.

TI-Writer: Select option #3 - "UTILITY". Type the filename DSK1.PR and press ENTER. The program will load and run

Before loading and using PrEditor, skip to the section Configuring PrEditor for details on setting up the program for your specific system. Once loaded, proceed to the next section below.

Orientation:

Before you get started, it is worthwile mentioning some of the features and functions of PrEditor. Before you can understand PrEditor and use it productively, you have to know what it is capable of:

* PrEditor will allow you to have two files or more files in memory at once. You can switch between them at a touch of a key.

* When switching between files the environment in each area is preserved. When switching back and forth you are returned to exactly the point in either file that you were last at.

* You can cut and paste text between files, that is take a piece of one file and put it in another.

* You have a full range of text editing functions; insert, delete, and many others.

* PrEditor offers many block manipulation functions; move, copy, and delete.

* A search and replace command is available.

* A disk cataloguer is available.

* You can view a file while editing two others.

* PrEditor is fully configurable, allowing you to set it up to accept as default a specific hardware configuration, user preferences, and the key map. You can specify which performs which function.

Defining some of the terminology that will be used to describe features is also useful. If you use TI-Writer you are familiar with the concept of the screen being a "window" into a text file. When you press a key in that editor the "window" moves up, down, left and right within the file. The window is that part of the text file you can currently see. PrEditor allows you to have two files in memory at once, stored in separate areas. Since you only have one screen, you can only see one "window" (or a small part of one file) at a time. Hence, if you want to see the other file (or the small part of it that can be seen on the screen), you have to "switch the window". If you just want to see another part of the same file you will want to "move the window". PrEditor also allows you to view a file stored on disk. When you tell the program to do this, the screen clears and shows a "window" of the text file on disk (or a part of it). "Window"is a noun, it means that part of a file you can see at any one time.

When PrEditor first loads, all you see is a white screen with green text on it. Your cursor will be in the upper left hand corner waiting for you to press a key. The text you see, while minimal (and seemingly arcane the first time you look at it), is nevertheless very important. It is the "STATUS LINE" which helps you to keep track of what you are doing, and what is going on.

The "STATUS LINE" has a number of brackets on a single line. From left to right they are:

=[0]=

This set of brackets contains the current line number your cursor is located at in the file currently on the screen. If you were to load a file into one area, then switch the window and load a second file and scroll down through it a bit, then switch back to the first you will notice that this counter shows your changes in location.

=<0: 0/ 0>=

This set of brackets contains block marking information. The first number is the file in which the block is marked. The first number is the file in which the block is marked. The second is the first line of the block (you can only select one block at at time), and the third is the last line of the block. When you switch between files this does not change, hence you could select a block in one file, elect to move it, switch to the second file's window, and place the block in the second file.

=(0)=

This set of brackets tells you which file you are currently looking at.

=ila=

An "i"will be displayed on the status line if you are in "TEXT INSERT mode" (FCTN[2] toggles this mode on and off) where you can insert text within a line. An "l" will be displayed if you are in "LINE INSERT mode" (FCTN[8] toggles this mode on and off) which means every time you press ENTER a new line is created after the one you previously entered). Finally, an "a" will be displayed on the status line if you are in "AS-IS mode"(CTRL[4] toggles this mode on and off) where any ASCII character typed will appear on the screen. If you leave any of the modes, the character for that mode will disappear from the status line.

Now that you understand what PrEditor can do, what we mean by a "window", and what the "status-line"is, it is time to move on.

How to use an Editor: part 1

PrEditor is a text editor. If you are familiar with TI-Writer or the Editor/Assembler Editor, then you have some concept of what an editor does, and is for. If that is the case, you may want to jump to part 2.

A text editor is a program that lets you type text on to the screen with the computer keyboard. The letters on the screen can be a letter to a friend, or a program or anything else. Since the screen is only so wide (40 characters on a TI99/4A), sometimes you want the text to be wider then the screen (if you are writing a letter, for instance, and you do not want it to be one long, thin strip when it is printed out). Text editors on the TI99/4A take care of that for you usually; as you type, the screen you previously typed disappears on the left hand side of the screen. Do not be alarmed, the moment you press ENTER the text typed at the beginning of a line will appear in front of you.

Sometimes, while you type, you will make mistakes. With a non-correcting electric typewriter this can make your document look bad. With a text editor, though, all the letters you type are only patterns of light on the screen, as easily erased as created. To change a letter, you use the cursor (the square, blinking block which represents the location on the screen where the next letter you type will appear). You move it by pressing the key with the appropriate directional arrow on it. To go up the screen, press the FCTN key and hold it then press the up arrow, etc.

Sometimes when you type you forget entire words, or add too many characters. A text editor lets you take care of that. When you press a key it will let you type more on the line (it will shift the text one character to the right for each one you type), or if you press another it will delete the character under the cursor. Text editors also have more sophisticated keys that let you delete words, lines, whole paragraphs or blocks at a time, as well as commands for inserting completely new lines or blocks of lines.

What is the use of typing something on a screen when it will all disappear when you turn off the computer? Text editors will let you save your work to a disk or load text you created before, usually with one or two commands. Most of them will let you print text "file" you currently have in the computer to an attached printer.

How does a text editor take all these commands? All keyboard usually have extra keys that are not used in normal typing of text, "function" and "control" keys. Some text editors will perform a given command when you press one of these keys, as well as one or more others simultaneously (for example, if you press FCTN and K at once some command may be called). Others have keys for simple things (such as deleting text), but for more complicated things such as saving a file to disk or searching for a given word, you have to press one key, and then type in a command from a list of possible commands.

Once you have created a file with a text editor, you may want to print it a special way. Some text editors come packaged with a text formatter, which is a program that reads through a text file and looks for certain combinations of characters (for example .CE). When it sees these series of characters, it prints the text the way the command tells it to (in this example, it would center on the page the text on the line after the command). A formatter is a program that just means you have to type a lot less, but do have to memorize the names and functions of specific commands that you include (or embed) in a text file.

How to use an editor part 2

PrEditor is similar to other text editors for the TI99/4A, such as TI-Writer, but dissimilar in important ways. For one, PrEditor will not allow you to move the cursor to the right unless there is text on the line the cursor is at (this text includes spaces). Since PrEditor does not have to store a lot of blank space unless you specifically tell it to, it can put more text in memory, as well as allow you to move through your file more quickly. If you want to see what is on the right hand side of the file, you can move the window with the same command TI-Writer uses, FCTN[5].

PrEditor also, unlike TI-Writer, lets you define how many characters you want the window to move to the right as you type. TI-Writer automatically moves 20 characters to the right, which can be disconcerting if you are not used to it and can also cover words you previously typed. PrEditor, unless you tell it otherwise (refer to Configuring PrEditor), moves one character at a time to the right. This makes it a bit easier to look back over what you just typed in case your mind wanders.

Other than these points, if you are familiar with TI-Writer, PrEditor will look much the same except everthing seems to be faster.

Functions:

PrEditor, like TI-Writer, has a broad range of functions. Unlike TI-Writer or the Editor/Assembler editor, they are all accessible with a single key press. There are advantages and disadvantages to this as opposed to the command-line approach found in TI-Writer.

The disadvantage is that it takes a while to familiarize yourself with the commands in PrEditor. The advantage is that once you do, you can work a lot faster than you would with TI-Writer since you only have to press a single key to call any function.

The functions in PrEditor are roughly divided into five categories :
Window functions (those function keys that move the window or allow you to move in one), Editing functions (functions used for manipulating text directly), Block functions (those functions dealing with blocks), File functions (functions for manipulating the whole file at once), and Miscellaneous functions (those functions that do not fit in with the rest).

Window Functions

These functions are used for moving the window or the cursor within it. Note that all functions listed below can be reconfigured (refer to Configuring PrEditor).

FCTN[4] - Roll Down moves the window 21 lines towards the end (or bottom) of the file
FCTN[5] - Next Screen moves the window to the right in the file (the number of characters depends on what you set the margins at in the configure program). When you get to the right hand side of a file, pressing this key again takes you to the left hand side.
FCTN[6] - Roll Up moves the window 21 lines towards the beginning (top) of the file
FCTN[7] - Tab moves the cursor to the next tab location. Unless you have changed them (see the section Configuring PrEditor) the default tab positions are 1, 8, 13, 26, 31, 46, 60 and 80
FCTN[S] - Cursor Left moves the cursor one position to the left of its current position.
FCTN[D] - Cursor Right moves the cursor one position to the right of its current position.

FCTN[E] - Cursor Up moves the cursor one line towards the end of the file.
ENTER moves the cursor to the first column of the next line.
CTRL[5] - Switch File switches the window between the first file and the second file (if any) in memory.
CTRL[H] - Beginning of Line moves the cursor to the beginning of the line it is on.
CTRL[A] - Append moves the cursor to the end of the line it is on.
CTRL[F] - Forward moves the cursor to the right by one word. Words in PrEditor are any set of characters bound (or delimited) by spaces or commas.
CTRL[G] - Go to line number. Press this key results in PrEditor asking you for a line number and press ENTER. The cursor will be moved to the beginning of that line. If the number specified is beyond the end of the file, it will take you to the last number in the file.

Editing Functions

These functions are used for manipulating the text directly.

FCTN[1] - Delete Character deletes the character at the cursor location.
FCTN[2] - Insert Character toggle. Turns on and off the "Insert Character" mode. When in this mode any character you type results in the character to the right begin pushed over one column.

Note! All characters after 80 columns are lost. Press again to leave this mode.

FCTN[3] - Delete Line deletes the line the cursor is located on.

FCTN[8] - Insert Line toggle. Turns on and off the "Insert Line" mode. When it is initially turned on, a blank line is created at the location of the cursor. Every time you press ENTER while it is on, the cursor moves the first column of the next line, where a blank line is created. Press again to leave this mode.

CTRL[2] - Split Line. Pressing this causes all the characters to the right of the cursor to shift down a line. Allows you to insert on lines with lots of text without losing any of it. Note! Will not reformat.

CTRL[4] - "As-is" toggle turns this mode on and off. When this key is pressed the next character typed will be included "as-is", which means you can use this to include a control or function key character in a text file. Press again to leave this mode.

CTRL[K] - Delete to the end of line. Deletes all characters to the right of the cursor to the end of the line.

Block functions

These functions deal with manipulating text in blocks.

FCTN[,] - Begin Block marks the line where the cursor is located at as the first line of the block. Note! Must use first before using FCTN[.].

FCTN[.] - End Block marks the line the cursor is located at as the last line of block. Note! Will reset if use FCTN[,] after setting this one.

CTRL[8] - Copy Block copies a previously marked block to where the cursor is currently located. (But must not be located within the block.) The original text stored in the block is not altered by this command. Functions between files. Note! If used before the block numbers, to copy again will have to remark block.

CTRL[9] - Move Block moves a block to where the cursor is currently located. Physically moves the text stored in the block from where it was marked to the new location. It will delete all lines were text was moved from. Functions between files.

CTRL[0] - Delete Block deletes the text stored in a marked block. On selecting this option you will be given a prompt CONFIRM (Y/N/A)? Press "Y" or "A" if you want the block deleted, and "N" if you do not. This command functions only within a single file at a time. Note! No OOPS! Key

File Functions

These functions are used for manipulating a complete text file at once. Note! The next two functions listed work from where the cursor is placed to the end of the file only.

CTRL[6] - Search. PrEditor prompts you to enter word or words to be searched for when you press this key. Note! this search is case sensitive (the characters in the string to be found must be precisely as they are entered). Once found, the cursor is moved to the start of the string, which will be highlighted in inverse characters.

CTRL[7] - Search and Replace functions. Like the search command above but prompts you to enter a replacement string for the string to be searched. If the string is located it will be highlighted in inverse characters, and you will be given a prompt CONFIRM (Y/N/A)? Press "Y" if you want the string replaced with the replacement string, "N" if you do not, and "A"if you want all incidences of the string replaced with the replacement.

CTRL[=] - Purge Buffer purges or erases an entire text buffer. On selecting this function you will be given a prompt CONFIRM (Y/N/A)? Press "Y" or "A" if you want to delete the text in the current window, or "N" if you do not. It will not effect the window that it is currently not on display.

CTRL[L] - Load File prompts you to enter a DSK?.FILENAME then press ENTER. It will load the file into the file area that you are currently in. To load a second file switch the window to the second file area.

CTRL[S] - Save File or Print File. Save the current file area to the filename you enter at the prompt. If you have 2 files in memory, you must save each file individually by switching the window after saving the first, and pressing this command to save the second. To Print send it RS232 or PIO.

FCTN[9] - Escape. This key may be pressed to "ESCAPE" from any prompt given by another command.

FCTN[0] - Show Memory shows the amount of free memory left for both text files.

FCTN[=] - Quit from PrEditor without saving the contents of memory.

CTRL[C] - Catalog disk prompts you for the number of the disk drive (1-5 over 5?) containing the disk to be catalogued. Displays a listing of the files on the screen until you press a key to return to editing.

CTRL[V] - View File. Enter DSK?.FILENAME (must be Display variable 80 file). Will only allow you to view the file.

Configuring PrEditor

Extended BASIC: select Extended BASIC from main menu - a short menu will appear. Press 2 and configure program will load and run.

Editor Assembler: Select option #5 - "RUN PROGRAM FILE" and type DSK1.CONFIGURE and press <ENTER>.

TI-Writer: Select option #3 - "UTILITY". Type the filename DSK1.CONFIGURE and press <ENTER>.

When selecting options and typing text, the following function keys are active:

FCTN[S] - move the cursor to the left
FCTN[D] - move the cursor to the right
FCTN[1] - delete character at the cursor
FCTN[2] - insert character at the cursor
FCTN[3] - delete from the cursor to the end of line
FCTN[9] - return to the previous prompt (restrictions)
CTRL[H] - send the cursor to the beginning position
CTRL[A] - append to the end of line

Also note that every option has a default selection that can be selected by just pressing <ENTER>.

The first thing that configure asks when it loads is the drive and filename of the PrEditor program itself on your disk. Configure actually modifies the program internally. Because it does this it is recommended to make backup copy of PrEditor and store original prior to using or configuring PrEditor.

Configure was designed this way so you can easily change the name,and even create multiple versions for your own use in different situations. If you did not change the filename, then type DSK1.PR and press <ENTER>. If this is not the correct filename Configure will tell you so, and ask you to re-enter the filename. You can quit configure altogether at this point by pressing FCTN[9].

After you have told it the filename of PrEditor, you will be asked to enter the background and foreground colors of the PrEditor screen. Simply select the letter of your choice for each. You will then be asked if your computer can display 80-columns. Only answer "Y" to this if you have a Geneve, or one of the 80-column cards (Mechatronics, etc).

Next you must enter the actual screen margins. This determines the width of the window you see on the screen. With either type of display you can set the left margin from 0 to 9. With an 80-column display you can set the right margin from 70 to 79 and with a standard 40-column display 30 to 39. PrEditor begins counting at 0.

Next you will be asked to enter how many characters you want the window to scroll when the cursor is at the left or the right side of the screen. This value can be anywhere from 1 to 39 (and is unnecessary if you have an 80-column display).

Next, you must enter the cursor attributes, the rate it flashes and the rate it moves. To increase the rate the cursor flashes, reduce the default value, and to make it flash slower, increase it (this is the length of pause between flashes). This may have to be modified if you are using PrEditor with Batch-It program (see User Notes below). Next, You must enter the time of the delay before the auto-repeat function steps in when you hold a key down. Finally, enter the speed that the cursor moves when it moves up and down lines. As with the others, increase this value to make the cursor move more slowly.

Next, you will be asked to set the tab stops. The default settings are the same as in the Editor/Assembler editor, but if you are writing programs in a language like c99, Pascal, or particularly FORTRAN 99 (which is very sensitive to the location of code on the screen), you will want to reset these to the new values. For instance, for FORTRAN 99 you may want to set tab stops at 2(for line numbers) 6 (for continuation characters), 7 (for actual command lines), and 9, 11, 13, 15 and 17 for structure indenting.

You will next be prompted to enter the "MEMORY MODEL" you would like. PrEditor can take advantage of additional memory found in the Mini-Memory, SuperSpace or SuperCart. An extra 4K to 8K can really come in handy sometimes. If you want to use PrEditor with either, select the appropriate option, or none if you do not have or want to use one of these modules.

Finally, configure will ask you a battery of questions which constitute a truly unique feature of PrEditor. If you do not like the key used to get a certain command you can change it! PrEditor will allow you to "re-map" any of the single key commands it accepts. For instance, you could tell it to use CTRL[E] to move the window up 21 lines instead of FCTN[6] if you prefer the key used for that function in DM1000 over the one in TI-Writer. Similarly, you can assign any of the functions to any key to any extent that you would like. You will have to make a note of any changes you make to the Quick-Reference card or elsewhere.

To change the key for any function, simply press the key you wish the function assigned to when you are prompted to enter the key for that function. Do not enter more than one function per key.

After you have answered all these questions, you will be asked if you want to re-enter any, and if not, if you want to save them or not. Give answers appropriate to what you want to do. The configure program will return you to the master title screen when you are done.

User Notes:

PrEditor can fit into most development environments easily except perhaps Forth. It reads and writes standard D/V-80 text files, which means you can begin using it immediately without conversions.

PrEditor can be easily installed in the Funnelweb environment by referring to the instructions on loading and running program-image assembly programs. It can also be loaded into a SuperSpace in lieu of the normal Editor/Assembler editor. C99 and Assembly programmers can simply load and run it through whatever module they happen to use for developing applications in either. The situation is somewhat different with Turbo Pasc 99 and FORTRAN 99 - both of those compilers include integrated editors that are to one degree or another designed for those languages. However, without exception, PrEditor is faster and more efficient than any other program editor for the TI99/4A, and can be customized for any language to boot. With either of those languages, it may be worthwhile to use PrEditor externally from the normal programming environment, and to simply enter the environment to compile, link and run the programs written. This solution is simplified if you have a RAMdisk or large capacity floppy drive.

Finally, PrEditor has been designed (and actually was used to write) Batch-It, which is by Tom Bentley and Charles Earl. Batch-It, among many other things, gives you the ability to create macros for use within PrEditor. It also enables you to load and run PrEditor easily from a Mini-Memory. PrEditor has been continuous use in writing programs since it was written. In addition to Batch-It, it has also been used extensively in the development of Telco. o

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```
SCORE STILL ZERO??
      198 196
More help for above problem.
      105 104 17 198 196
Solution to above problem.
      96 152 17 198 196 112 68 21 104

STILL MISSING SOME GEMS??
      71 134 107 57 147 210 112 226
More help for above problem.
      167 201 179 102 71 134
Solution to above problem.
      57 159 179 71 134
STILL MISSING SOME GEMS??
      137 37 116 152 179 102 71 134
More help for above problem.
      146 102 218
Solution to above problem.
      217 102 11

PRINTING PRESS A PROBLEM??
      21 203 179 49 129
More help for above problem.
      20 201 179 102 184 158 89 177 73 102 218 89
Solution to the above problem
      20 29 95 23 32 53 158 142 147 210 145 226 145 61
      145 124 145 11 145 110 145 197 145 86 64
FAN USED UP A HEAVY ITEM YOU NEEDED LATER??
      213 130 38 214
More help for above problem.
      204 162 136 130 160
Solution to the above problem
      9 196 83 207 68 57 207 206 72 91 73 35 9 196 79

CAN NOT FIGURE OUT HOW TO GET GEM FROM NEWSPAPER??
      113 162
More help for above problem.
      224 75 171 154 127 112 94 193
Solution to the above problem
      21 2 83 49 6 53 224 75 100 216 154 127

STILL MISSING GEMS??
      36 144 164
More help for above problem.
      178 179 27 213 66 98
Solution to above problem.
      82 202 64 178 187 179 27
```

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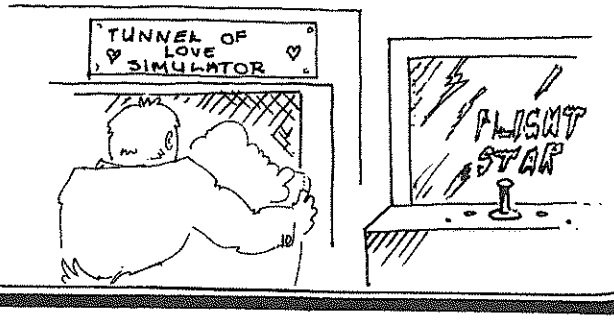


Techo Time with Lou Amadio

Hi fellow 99ers

I have been nominated as the club's Technical Coordinator for 1989. First of all my congratulations to both John Paine and Peter Schubert for reporting on the club's technical activities over the past 2 years. They have written a number of very interesting articles on hardware modifications, repairs and construction. Well done!

Perhaps a little bit of background to explain my situation. I am a Metallurgist by trade and electronics and computing are my hobbies. That is why I enjoy them so much! What I know about electronics is basically self taught; gleaned from reading publications such as Electronics Australia, building numerous electronics projects and generally keeping my ears open.

Having said all that, I also happen to have as a friend one of the brightest people involved in electronics and computing, namely Dr Geoff Trott.

My own computer system consists of a modified console with switchable internal Extended BASIC, internal 32Kbytes on the 16 bit bus (fast memory), internal cartridge RAM at >6000, 1 Kbytes scratchpad RAM at >8000 and a modified power supply for cooler running (more on this later). Connected to the console is a PEB with twin DSDD drives, Myarc controller, TI RS232, 2 RAMdisks, Triple Tech card with printer buffer and clock, a Peter Schubert modem card, a LOAD interrupt switch and a modified power supply (for cooler, quieter running) and a Star NX1000 printer (incidently, removing the 32Kbytes card from the PEB saves about 0.5 amp on the +5 volt supply).

Plugged into the console I have a Super Module (TND December 1988) with Editor Assembler, MiniMemory and 32Kbytes of battery backed RAM, 2 cassette players with a volume level monitor and a colour TV modified for composite video input via a modified (plastic) modulator (based on advice from John Paine). As the TV has a live chassis (most colour TVs do these days) it is powered through a 240/240 volt isolation transformer.

I also have a second computer for the children with internal 32Kbytes memory and a stand alone disk drive with built in TI disk controller card, interface and power supply.

Apart from the above, I have dabbled in many smaller projects such as a Multi-Module with Disk Manager 2, TI-Writer and Editor Assembler, analogue joysticks, micro switch joysticks, cassette signal meters, printer switches etc, etc.

But, enough of the ramblings. I would be pleased to hear from anyone with advice, queries or problems related to hardware. Naturally, I have no way of knowing what is required without some form of feedback from you. In any case, I will publish whatever comes my way from whichever source. You may contact me on the BBS courtesy of the TND Editor (Geoff Trott). If the BBS joining fee is dropped this year as indicated as the February meeting, then I may be enticed to rejoin (the BBS group). As it stands at the moment, it is bad enough having to pay STD phone rates without the additional joining fee as well.

Hardware Hints

I intend to publish a number of hardware hints each month, some new and some not so new (eg TND archives back to 1983) or any other source that I come across.

The hint for this month relates to an article that I wrote for the TND, in December last year, on "Taking the heat of the TI99/4A". This hardware modification was perhaps the simplest and most worthwhile that I have done to my computer. However, it appears that if the mains voltage falls below the "normal" range (ie 240 -10%), then some distortion of the TV picture may occur. I noticed it on my screen when the mains voltage dropped to 200 volts one evening. My cure was simply to short the external 18 ohm (10 watt) resistor with a wire and two alligator clips (The external mounting of the resistor makes this very simple to do). The very low mains voltage only lasted one evening, and the shorting strap has not been used since. If, however, you have a "permanent" low mains voltage in your area and you wish to make this useful modification, you could experiment with lower values for the 10 watt resistor, eg 15, 12 etc, whichever will allow 16 volts DC to pass on to the 7812 voltage regulator on the console power supply board.

Reliable LOAD Interrupt

by Lou Amadio and Geoff Trott

TMS9900 Interrupts

The TMS9900 has two interrupts; RESET and LOAD. RESET is used during power up and also by Command Modules when they are inserted into the GROM port. LOAD (not normally used in the TI99/4A) causes the processor to do an interrupt sequence through addresses 65532 to 65535 (>FFFC to >FFFF), at the top of memory expansion. LOAD is only useful if a program and its vectors are present in these locations of expansion RAM. However, if, for instance, DEBUG were loaded into RAM prior to loading and running your development program, then pressing the LOAD interrupt will, if properly set up, get you into DEBUG. More importantly, however, if the LOAD switch works as it should, then by exiting DEBUG (ie with "q") then you will return to your development program at exactly the same point that you left it even if the program was running at the time of the interrupt.

How Does a LOAD Interrupt Work?

It is possible to interrupt the operation of a program on the TI99/4A by pulling pin 4 of the TMS9900 CPU low. According to the TI Data Manual:

"When active (ie low), LOAD causes the TMS9900 to execute a nonmaskable interrupt with memory addresses >FFFC and >FFFE containing the trap vector (WP and PC). The LOAD sequence begins after the instruction being executed is completed. LOAD will also terminate an idle state. If LOAD is active during the time that RESET is released, then the LOAD trap will occur after the RESET function is completed. LOAD should remain active for one instruction period. IAQ can be used to determine instruction boundaries. This signal can be used to implement cold start ROM loaders."

In its simplest form a LOAD interrupt could be executed by switching pin 4 of the TMS9900 to ground. TI, however, recommend a circuit utilising a single 74LS74 to ensure that pin 4 of the CPU remains low for one instruction period.

Having built the basic circuit I am now in a position to comment on its performance. When the button is pressed, two or more interrupts are executed due to contact bounce on the push button switch. Now, if there is no intention of returning to the calling program, then this multiple interrupt will be of no concern. If, however, the intention is to return to the calling program, then we must ensure that only one interrupt is generated otherwise we lose the processor status saved at the first interrupt.

Debouncing the Switch

The push button switch was isolated from the 74LS74 by interfacing a 555 timer IC configured as a one-shot monostable. According to the DSE manual:

"In the monostable mode, the (555) timer functions as a one shot. Referring to the circuit, the external capacitor is initially held discharged by a transistor inside the timer.

When a negative trigger pulse is applied to pin 2, the internal flip flop is set, releasing the short across the external capacitor (10uF) and drives the output high. The voltage across the capacitor increases exponentially with the time constant RC. When the voltage across the capacitor equals 2/3 Vcc, the internal comparator resets the flip flop which then discharges the capacitor rapidly and drives the output to its low state.

The circuit triggers on a negative going input signal when the level reaches 1/3 Vcc. Once triggered, the circuit remains in this state until the set time has elapsed, even if it is triggered again during this interval. The duration of the output high is given by t=1.1RC. The timing interval is independent of supply voltage."

With the values given, the delay is :

t = 1.1 * 0.15 * 10 = 1.6 seconds

During this period, the push button switch has no further effect even if the the contacts "bounce".

There is another problem associated with power being applied. This occurs when the console is turned on if the supply for the circuit is obtained from the console. To stop a LOAD interrupt from occurring straight after the RESET completes, the reset input on the 555 is held low by a large capacitor (100uF) as is the reset input of one of the flip flops.

Building the Interrupt Circuit See figure on page 30

The circuit diagram below indicates the parts and connections required to build the LOAD Interrupt switch. The circuit, consisting of only 2 ICs and a handful of minor components, is easily built on a small piece of veroboard by cutting the appropriate tracks. Be careful with the orientation of the ICs and electrolytic capacitors. When completed, recheck everything (particularly the +5 volt and ground connections) prior to connecting the power.

Testing the Circuit

Once the circuit has been built, it should be tested by powering from a +5 volts supply and connecting a voltmeter from pin 3 of the 555 to ground. When the button is pressed, you should see approximately 3 volts which will stay high for approximately 1.5 seconds, after which it will drop to zero. Also, you can verify that the output cannot be changed by again pressing the switch within about 1 second.

Connecting the LOAD Interrupt

The LOAD Interrupt circuit must be connected to 4 points, all of which are available at the I/O port on the right side of the console.

1) +5V, pin 1
2) Ground, pins 21, 23, 25, 27
3) LOAD(L), pin 13
4) IAQ(H), pin 41

The above connections may be found in a number of places, and the final location will depend largely on where you want to mount the switch. If you have a Peter Schubert Mini Expansion System then this will provide a convenient place to mount the switch and connect the 4 wires. Other suitable places include the console itself, the speech synthesizer or the PEB. I mounted mine in the PEB connector which plugs into the console I/O port, however this is a very fiddly operation as there is very little room to work.

Once you are satisfied that the circuit is working as it should, connect the 4 leads as per circuit diagram and power up the computer. (You will need a copy of the TI99/4A Technical Manual, available from the club shop, to help you to locate the 4 connections mentioned above).

Using the LOAD Interrupt

Load DEBUG using E/A option 5, quit by pressing "q" and enter TI BASIC. Load in a BASIC program (or type in a few lines of code with an endless loop) and RUN the program. Press the LOAD Interrupt switch. The program will stop and you will see the DEBUG prompt ">". If you then quit from DEBUG you will be returned to the BASIC program at exactly the same place that you left it. A practical use would be to access a screen dump routine from a running program. (Note that if you press the LOAD Interrupt whilst in BASIC with no program running, the cursor will disappear. If you had previously loaded DEBUG, simply press "u" to show the DEBUG prompt).

Note:- An article on using the LOAD Interrupt, by Chris Lauhead, USA, appeared in the TND (December 1988, page 9).

Happy interrupting.

PE box Unregulated Voltage Levels

by Ben Takach

1. Every story has a beginning.

TI is an enigmatic organisation. Any equipment produced by its design staff is almost invariably light years ahead of its competition. When it comes to marketing and sales, well, they could not sell fish on Good Friday! Generally, the product is abandoned shortly after its release or when sales are about to sky-rocket. In the case of the CC40 the company offered to repurchase the units sold!

You are encouraged to write to the Consumers Relations Department if you need any help. All my letters were promptly and politely answered. The reply was invariably negative or evasive, but the closing remarks always prompted me to write again if further assistance is required. I guess this department is staffed by a bunch of avid stamp collectors. As I said TI is an enigmatic organisation!

The PE-Box power supply fits the TI puzzle. The technical manual clearly states that the unregulated supply to the cards are +8v, +16v and -16v. Many of us have made cursory checks to discover about +12v, +23v and -24v instead. In spite of all this, the over voltage did not seem to harm the cards. My full house PE box was sweating for long hours during the last 5 years without any ill effect to itself or the cards. So I was not inclined to interfere. To be truthful, I did not give it a second thought.

This happy state of affairs came to an abrupt end when the long awaited Myarc harddisk card arrived. It flatly refused to sweat it out! Even after I fitted heat-sinks to the 3 voltage regulators these were running at 85 degrees C. This is permissible according the data sheet, but I wanted it to run cooler.

2. Testing the PE Box.

It is essential to do the tests under operating conditions, at or near maximum load, not forgetting that besides the unregulated supply to the card sockets, regulated 5v and 12v is also provided by the power supply to the internal disk drives.

The following test procedure was planned:
- -simultaneous measurement of all voltages by individual meters connected to each source,
- -constantly monitoring the line voltage and the primary current during testing,
- -the use of a variac (steplessly variable transformer having 240v input terminals and 0 to 240v on its output terminal) to produce a variable primary input voltage,
- -constantly monitoring the input voltage and current to the PE box connected to the variable voltage output side of the variac,
- -monitoring the heatsink temperature of the 5v and 12v regulator fitted to the Myarc hard disk card by a 2 channel temperature recorder.

All together 10 instruments were used (none of these were Dicky Smith el-cheapos). Further, in order to reduce the inherent instrument errors due to the stated instrument inaccuracies the instruments were frequently switched during the tests and the readings averaged (unless secondary standard instruments are used, even the good quality bench instruments are inaccurate).

Needless to say, my work station resembled the cockpit of a Boeing 747!

The time of the test was also carefully chosen to reduce the chance of line voltage fluctuation. I decided to perform the test starting at 8pm on a Saturday.

Test results.

-The short term temperature measurements were inconclusive due to the thermal inertia of the regulators and the heat sinks (the regulators and heat sinks heat up rapidly, but it takes a long time to lose some sensible heat).

-Operating the computer for 8 hours (non stop) with 184v input to the PE Box resulted in stable 43 degree C heat sink temperature measured on the 12v regulator and 66 degree C on the 5v regulator. The ambient temperature was 25 (+0 -1) deg C.

The results of the voltage and current tests are summarised in the table below.

Summary of test results.

Supply line		PEB inputs		Unreg. DC supply			
volts	mA	volts	mA	+8v	+16v	-16v	Remarks
244	320	244	320	11.5	22.5	-23.5	The reg. 5v
244	410	220	300	10.5	20.5	-21.4	& 12v Disk
244	275	184	255	8.5	16.5	-17.3	drive supply remained stable 5/12v

Subsequently I connected an auto transformer with a 180v tap to the PE Box primary lead and was using the system for the last 2 weeks. The massive 25% supply voltage reduction has not caused any errors or malfunction. The system runs much cooler and the fan noise is somewhat reduced. Sound level however was not measured, thus it may be subjective wishful thinking. In fact the rpm of the shaded pole fan motor used in the PE box is by and large not voltage dependent. Thus if there is a loss of rpm it is only due to the reduced efficiency resulting in a larger degree of slip.

Considering the thermal aspects we can state: the power input at 244v is 78W (244v x 0.32A = 78.08W), and at 184v is 47W (184v x 0.255A = 46.92W). Thus the power reduction due to decreased input voltage is 31.16W. In other words using the full line voltage we have to cool a 30W soldering iron buried in the PE box! This is a frightening amount of BTU or Jules of heat per hour (1W = 1J/s and 1 BTU = 1055.06J).

3. What can we do about it?

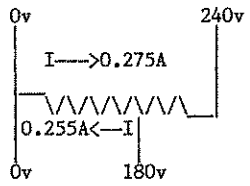
The options are:

(a) Do nothing.

This is the obvious choice if you have no PE Box. It is also the wisest move if your box is nearly empty, equipped only with a few original TI cards. These do not draw much current and do not cause any thermal problems. If on the other hand you are reaching for the sky then this is not the best option.

(b) Use an auto transformer.

The theory of auto transformers is not quite the same as that of the conventional double wound transformers. Briefly explained, the two windings, the primary and the secondary, are common. The laws of transformation of AC currents however still apply. Thus the two currents flow, the current from its 0 (common terminal) to the primary input terminal and the current from 0 to the output tapping flow in opposite directions.



The current in the winding 0-180v = 0.275A-0.255A = 0.02A and current in the winding 180v-240v = 0.275A.

The transformer needed will be very small: 180x.02 = 3.6W; 60x.275 = 16.5W which adds up to 20.1W

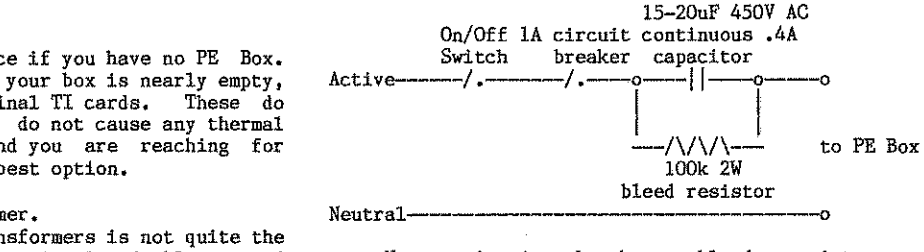
This is by far the most satisfactory option. The only problem is the odd voltage ratio. One just can not buy such an odd auto transformer.

I was operating my PE box for 2 weeks on a temporary basis through an auto-transformer off its 184v tap. It was most satisfactory. The temporary status was due to the transformer used. It was a 2kVA test unit, considered to be a massive overkill. My chances to get hold of a 20 to 30W 240/180V auto-transformer were zilch. Finally it took me a trip to Redfern and $12.50 to get a suitable alternative. Sheridan Electronics has boxes of it! I picked up one with 0-110-220-240v primary and a 24-0-24v, 0-6v secondary windings. Connecting all the windings in series (observing the correct winding polarity!), I had 180v on the 220v tap. It has worked well ever since. There are other transformers there with 0-110-220-240v primary and 4 secondary windings at 0-8v, 0-14v, 0-25v, 0-12v. Using the 14, 25 and 12 volt windings in series with the primary would work very well. What more can you expect for $12.50?

(c) Using a series capacitor.

This method is comparable to the use of a series resistor without the obvious heat problem associated with a resistor. This method has to comply with the requirements of the SAA standard AS3000-1981. A capacitor (or capacitors in parallel) of 15 to 20 uF would be required to drop the input voltage to 180v. The capacitors used must be rated not less than 450v AC at only be determined by trial and measurements due to the not stated leakage characteristics of the units. If the reduced voltage is too high then a lower value capacitor is needed, conversely if the voltage is too low then a higher uF capacitor has to be used. An undischarged capacitor is lethal, thus the use has to conform to the rules of the quoted standard. A bleed resistor has to be connected across the capacitor terminals. The capacitor(s) and associated components have to be securely fitted in a well earthed sturdy metal enclosure (capacitors can make an unholy mess when they decide to expire!). The best source is any electric motor rewind workshop. Such capacitors are used in split phase fractional hp electric motors. One can also make up a set using fluorescent lamp power factor correction capacitors. These may be purchased from any electrical trade outlets.

The wiring diagram of a series capacitor voltage reducer:



Note: circuit breaker, bleed resistor and capacitor to be installed in a well earthed metal box.

Pros and cons of using capacitors.

To be honest, I am not the best person to give advice on the use of capacitors, because I am not in favour of the method. So my list will be more cons than pros.

-Capacitors are proven to be the most unreliable members of the static electrical devices family.
-A 15-20uF high volt AC capacitor is quite large.
-Due to the mandatory bleed resistor, capacitors have to be connected after the on/off switch of the device it is controlling.
-Capacitors do seldom fail quietly and with grace. When they go, it is often like an untrained puppy having diarrhoea on your favourite lounge chair. Thus, sturdy enclosure and circuit breaker protection is mandatory.
-The reduced voltage is load dependent. This is not a problem in case of the PE box, where the load is near constant.

(d) Using a series inductor (choke or ballast).

Connecting an inductor of approximately 0.5H in series with the PE Box supply would reduce the input voltage to the required level. Again the exact value would have to be determined by measuring the input voltage to the PE box. Near correct value inductor would be a fluorescent lamp ballast. These can be obtained in different values from 15W to 100W for the various size fluorescent lamps.

Wire I/O Update

by Ross Mudie

Members will no doubt remember the Wire I/O peripheral which was in the July 1988 TIsHUG News Digest and was seen at the November and December meetings running a small model electric train set. The tutorial was also included in the February 1989 TND, without the assembly source files. I have changed the address of the Wire I/O system prototype from >8680 to >9300 to avoid false setting of the sound chip and to allow sound effects to be generated by the sound chip for the train set in the future. It is most unlikely that the speech synthesizer would be used on the same computer at the same time as the train set so the speech peripheral space is a logical area to use. (The address of the Wire I/O can be placed wherever spare space is on the memory map within the decoding ability of the address bus gating).

The train set was effectively got going in a month to be operational for the November tutorial day, so many compromises were made in the design of the hardware and software to meet the deadline. One of these was in the area of train control. Whilst two small trains can operate on the layout with the computer controlled signalling preventing crashes between trains of different speeds, the switching of the track sections allows the locomotive which is starting after a stop to pick up speed at an unrealistic rate. Clearly what is required is a speed controller which has independent control of each track section using Pulse Width Modulation (PWM) speed control techniques.

On a rainy day during my holiday I developed the basis of a design to provide such a PWM train controller using a 32K TI99/4A console and a second Wire I/O system. The TI99/4A which is running the train set signalling would be just too slow on its own, so the idea is to link between the computer running the train set and the computer running the PWM controller using the Wire I/O system. The operational technique is for the train set controller to tell the PWM controller which section is to go at what speed and in what direction. The PWM controller then maintains that setting for a section of track until a new message is received.

The TI99/4A running the PWM controller is quite fast enough to control 24 outputs (12 forward and 12 reverse) at around 100Hz with 8 speed settings. The program when controlling 64 outputs (32 forward and 32 reverse) achieved around 45Hz PWM control. I am now working on the program for the main train set computer to achieve the desired operation. I am hopeful of having the new operating system working for a Tutorial Day later in the year.

The Wire I/O design used for the PWM controller has also been simplified in the area of decoding. I used the Speech Block Enable (SBE) output from the console and a simplified address decoder because I only wanted 16 inputs and 32 outputs all up. The address space leaves 16 inputs or outputs free so this hardware could be expanded to provide 48 outputs, controlling 24 train track sections. Using the SBE was a bit tricky because it is intended to use the 16 bit bus and disables the SBE output when an odd address is placed on the address bus. The answer to this problem was a minor hardware modification which only uses the even addresses.

During the holiday I also started on improvement of the physical aspects of the little train set. The board with the track has a wooden frame underneath with space to slide the two consoles into apertures under the layout. Removable legs make the layout self supporting. My sons, Sam and Peter, have started placing scenery on the layout. The track is now ballasted, a road exists and some small undulations have "grown" grass. There is a level crossing with flashing lights, the computer got in the act here, and a system for operating the booms has yet to be devised. Two railway stations have been built and various small buildings and farm scenes are planned. (The return to school and the resultant home work has severely curtailed the speed of development at the moment.) What started as a demonstration system for a computer project is developing into an excellent family project.

My time to work on the project has suffered badly by the finish of the holiday and the need to give both the BBS and work the lion's share of my time, but I hope to have the two computer system operational for the next TIsHUG tutorial day.

By the way, some people have been wondering why I use cassette load for the train set. Quite simply I was not prepared to tie up an expanded system with PE box, etc, as a controller where old 32K consoles are quite suited to the job. I prepare the assembly software on a full system with RAMdisk to speed up the assembly process, then after implanting the assembly in Extended BASIC, save the program to cassette tape. Do not throw your old cassettes away, there is still hope for them yet for a project like this one.

Joy Talk, a low cost printer port for a 32K console

by Ross Mudie

Joy Talk was presented in 99'er Home Computer Magazine in June and July 1983. It is intended to provide a low cost RS232 printer port for a TI99/4A with Mini Memory plugged in. The Joy Talk hardware which uses three transistors, an IC and a few passive components plugs into the joystick port to gain access to I/O from the computer.

The original system uses an assembly program in the Mini Memory, linked from BASIC. I can see no reason why the program should not run in assembly linked from Extended BASIC in a 32K console. One problem that I see with the system as it stands, is that it does not allow the listing of a BASIC or Extended BASIC program to the Joy Talk output. With what we as a club know now about the TI99/4A I do not see this as a real problem as I believe that we can come up with an assembly program linked up with the Joy Talk assembly program to provide Extended BASIC listings. I see this as a project which could benefit some of our members who have only expanded their system as far as a 32K memory expansion and have an Extended BASIC cartridge.

My big question is: "Are there members who would like to see this project proceed?" Please let me know via the BBS or write c/o TIsHUG at PO Box 214, Redfern, 2016. If there is sufficient response then the next step will be to find people in the club willing to take on the task of building the prototype and writing and debugging software.

Tips from the Tigercub #54

by Jim Peterson, Tigercub Software, USA

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Over 120 original programs in Basic and Extended Basic, available on cassette or disk, now reduced to just $1 each, plus $1.50 per order for cassette or disk and postage and packing. Minimum order of $10. Cassette programs will not be available after my present stock of blanks is exhausted. The Handy Dandy series, and Color Programming Tutor, are no longer available on cassette.

Descriptive catalogs, while they last, $1 which is deductable from your first order.

Tigercub Full Disk Collections, reduced to $5 postpaid. Each of these contains either 5 or 6 of my regular catalog programs, and the remaining disk space has been filled with some of the best public domain programs of the same category. I am not selling public domain programs, they are a free bonus!

TIGERCUB'S BEST, PROGRAMMING TUTOR, PROGRAMMER'S UTILITIES, BRAIN GAMES, BRAIN TEASERS, BRAIN BUSTERS!, MANEUVERING GAMES, ACTION GAMES, REFLEX AND CONCENTRATION, TWO-PLAYER GAMES, KID GAMES, MORE GAMES, WORD GAMES, ELEMENTARY MATH, MIDDLE/HIGH SCHOOL MATH, VOCAB ULARY AND READING, MUSICAL EDUCATION, KALEIDOSCOPES AND DISPLAYS

NUTS & BOLTS DISKS

These are full disks of 100 or more utility subprograms in MERGE format, which you can merge into your own programs and use, almost like having another hundred CALLs available in Extended Basic. Each is accompanied by printed documentation giving an example of the use of each. NUTS & BOLTS (No. 1) has 100 subprograms, a tutorial on using them, and 5 pages of documentation. NUTS & BOLTS No. 2 has 108 subprograms, 10 pp of documentation. NUTS & BOLTS #3 has 140 subprograms and 11 pages of documentation. Now just $15 each, postpaid.

Tips from the Tigercub

These are full disks which contain the programs and routines from the Tips from the Tigercub newsletters, in ready-to-run program format, plus text files of tips and instructions.

TIPS (Vol. 1) contains 50 original programs and files from Tips newsletters No. 1 to No. 14. TIPS Vol. 2 contains over 60 programs and files from Nos. 15 to 24. TIPS Vol. 3 has another 62 from Nos. 25 to 32. TIPS Vol. 4 has 48 more from issues No. 33 through 41. Now just $10 each, postpaid.

```
**************************************
*                NOW READY           *
*      TIPS FROM TIGERCUB VOL. 5     *
* Another 49 programs and files from *
* issues No. 42 to 50.  Also $10 ppd *
**************************************
```

Tigercub Care Disks #1, #2, #3 and #4. Full disks of text files (printer required).

No. 1 contains the Tips news letters #42 to #45, etc. Nos. 2 and 3 have articles mostly on Extended Basic programming. No. 4 contains Tips newsletters Nos. 46 to 52. These were prepared for user group newsletter editors but are available to anyone else for $5 each postpaid.

This program uses the program that writes a program technique to create a program that can be used over and over to create quiz programs.

When you key in the these routines, Do not change any line numbers!

First key in this routine and run it to create a D/V 163 file named ASCII on the disk in drive 1.

```
100 OPEN #1:"DSK1.ASCII",VARIABLE 163,OUTPUT
110 FOR J=1 TO 125 :: X$=X$&CHR$(J)::
    X2$=X2$&CHR$(J+125) :: NEXT J
120 PRINT #1: CHR$(0)&CHR$(230)&"X$"&CHR$(190)&
    CHR$(199)&CHR$(125)&X$&CHR$(0)
130 PRINT #1: CHR$(0)&CHR$(240)&"X2$"&CHR$(190)&
    CHR$(199)&CHR$(125)&X2$&CHR$(130)&"J$"& CHR$(190)&
    "X$"&CHR$(184)&"X2$"&CHR$(0)
140 PRINT #1:CHR$(255)&CHR$(255)
```

Next, key in this part -

```
220 CALL CLEAR :: CALL SCREEN(5):: FOR SET=1 TO 12 ::
    CALL COLOR(SET,2,8):: NEXT SET :: DIM L$(250,4)
230 !skip to line 280!
280 READ M$ :: DISPLAY AT(2,14-LEN(M$)/2):M$ :: FOR J=1
    TO C :: READ M$ :: DISPLAY AT(6+J,4):J;M$ :: NEXT J
290 DISPLAY AT(12,1):"Category to match?
    (1-"&STR$(C)&")" :: ACCEPT AT(12,26)SIZE(1)
    VALIDATE("1234"):M :: IF M>C THEN 290
300 IF C=2 AND M=1 THEN A=2 :: GOTO 320 ELSE IF C=2 AND
    M=2 THEN A=1 :: GOTO 320
310 DISPLAY AT(14,1):"Match against (1-"&STR$(C)&")" ::
    ACCEPT AT(14,21)SIZE(1)VALIDATE("1234"):A :: IF A>C
    OR A=M THEN 310
320 DISPLAY AT(16,1):"How many choices? (2-5)" ::
    ACCEPT AT(16,25)SIZE(1)VALIDATE("2345"):CH :: IF
    CH>N-1 THEN 320
330 FOR J=1 TO N :: FOR L=1 TO C :: READ L$(J,L):: NEXT
    L :: NEXT J
340 X$=SEG$(J$,1,N):: FOR J=1 TO CH :: RANDOMIZE ::
    X=INT(LEN(X$)*RND+1):: Y(J)=ASC(SEG$(X$,X,1)) ::
    X$=SEG$(X$,1,X-1)&SEG$(X$,X+1,255):: NEXT J
350 Z=INT(CH*RND+1):: IF L$(Y(Z),1)=Y$ THEN 350 ELSE
    Y$=L$(Y(Z),1)
360 DISPLAY AT(8,1)ERASE ALL:L$(Y(Z),M):: FOR J=1 TO CH
    :: DISPLAY AT(10+J,4):J;L$(Y(J),A)
370 NEXT J :: DISPLAY AT(23,1):""
380 DISPLAY AT(20,1):"(1-";STR$(CH);")?" :: ACCEPT
    AT(20,8)SIZE(1)VALIDATE(DIGIT): Q :: IF Q=0 OR Q>CH
    THEN 380
390 IF L$(Q,M)<>L$(Z,M)THEN 410 :: DISPLAY
    AT(23,1):"CORRECT!"
400 CALL SOUND(100,659,5):: CALL SOUND(100,784,5)::
    CALL SOUND(400,1047,5):: GOTO 340
410 DISPLAY AT(23,1):"WRONG!" :: CALL
    SOUND(300,110,0,-4,5):: GOTO 380
```

Enter MERGE DSK1.ASCII and then SAVE DSK1.QUIZ,MERGE

Then key in -

```
100 OPEN #1:"DSK1.QUIZ",VARIABLE 163,INPUT :: OPEN
    #2:"DSK1.QUIZ/2",VARIABLE 163,OUTPUT
110 FOR J=220 TO 410 STEP 10 :: LINPUT #1:M$ :: CALL
    LINE(J,LN$)
120 PRINT #2:LN$&CHR$(156)&CHR$(253)&
    CHR$(200)&CHR$(1)&"1"&CHR$(181)&
    CHR$(199)&CHR$(LEN(M$))&M$&CHR$(0):: NEXT J
130 PRINT #2:CHR$(255)&CHR$(255):: CLOSE #1 :: CLOSE #2
140 SUB LINE(LN,LN$)::
    LN$=CHR$(INT(LN/256))&CHR$(LN-256*INT(LN/256))::
    SUBEND
```

Run that to convert the merge file QUIZ into another merge file QUIZ/2. Then key this in.

```
100 CALL CLEAR :: CALL SCREEN(5):: FOR SET=1 TO 12 ::
    CALL COLOR(SET,2,8):: NEXT SET :: DISPLAY
    AT(2,5):"TIGERCUB QUIZWRITER"
110 CALL CHAR(64,"3C4299A1A199423C"):: DISPLAY
    AT(4,1):"@ Tigercub Software for
    free":"distribution - no copying ":"fee may be
    charged."
120 DISPLAY AT(8,1):"This program will
    write":"multiple-choice quizzes of":"the category
    match type."
130 DISPLAY AT(11,1):"It will accept up to
    250":"records, if memory permits,":"and up to 4
    categories per":"record."
140 DISPLAY AT(15,1):"For instance, a quiz on
    the":"table of elements could have":"the element
    name, its symbol":"and its atomic weight."
150 DISPLAY AT(19,1):"The program will allow you":"to
    select which two cate-":"gories to match."
160 DISPLAY AT(23,8):"PRESS ANY KEY" :: DISPLAY
    AT(23,8):"press any key" :: CALL KEY(5,K,S):: IF
    S=0 THEN 160 ELSE CALL CLEAR
```

```
170 DISPLAY AT(2,1):"The Quizwriter can be used":"over
    and over to write any":"number of different
    quizzes,"
180 DISPLAY AT(5,1):"and each quiz can be SAVEd":"and
    run again and again."
190 DISPLAY AT(12,1):"Place a disk in drive 1
    with":"enough space available for":"the quiz."
200 DISPLAY AT(15,1):"What filename will you use":"for
    the quiz?":"DSK1." :: ACCEPT AT(17,6):F$ :: CALL
    CLEAR
210 OPEN #1:"DSK1."&F$,VARIABLE 163,OUTPUT
220 !skip to line 420!
420 DISPLAY AT(8,1):"TITLE OF QUIZ?" :: ACCEPT
    AT(10,1):T$
430 T$=CHR$(147)&CHR$(200)& CHR$(LEN(T$))&T$ :: DISPLAY
    AT(12,1): "NUMBER OF CATEGORIES (2-4)?"
440 ACCEPT AT(12,28)SIZE(1)VALIDATE("234"):C :: PRINT
    #1:CHR$(0)& CHR$(250)&"C"&CHR$(190)&CHR$(200)&
    CHR$(1)&STR$(C)&CHR$(0)
450 FOR J=1 TO C :: DISPLAY AT(12+J*2,1):"CATEGORY
    #";STR$(J);" TITLE?" :: ACCEPT AT(13+J*2,1):C$(J)
460 T$=T$&CHR$(179)&CHR$(200)& CHR$(LEN(C$(J)))&C$(J)::
    NEXT J
470 PRINT #1:CHR$(1)&CHR$(14)&T$&CHR$(0)
480 DISPLAY AT(2,1)ERASE ALL:"INPUT DATA":;:"(input END
    when finished)"
490 N=N+1 :: Z$="" :: DISPLAY AT(6,1):"RECORD
    #"&STR$(N)&RPT$(" ",200):: FOR J=1 TO C :: DISPLAY
    AT(7+J,1):C$(J):: ACCEPT AT(8+J,1)SIZE(20):Y$
500 IF Y$="END" THEN N=N-1 :: GOTO 530
510 Z$=Z$&CHR$(200)&CHR$(LEN(Y$))&Y$& CHR$(179):: NEXT
    J
520 LN=1000+N :: CALL LINE(LN,LN$):: PRINT
    #1:LN$&CHR$(147)& SEG$(Z$,1,LEN(Z$)-1)&CHR$(0)::
    GOTO 490
530 PRINT #1:CHR$(1)&CHR$(4)&"N"&CHR$(190)& CHR$(200)&
    CHR$(LEN(STR$(N)))&STR$(N)&CHR$(0)
540 PRINT #1:CHR$(255)&CHR$(255):: CLOSE #1
550 DISPLAY AT(8,1)ERASE ALL:"Enter NEW":;:"Enter MERGE
    DSK1."&F$:;:"Enter SAVE DSK1."&F$:;:"RUN" :: END
560 SUB LINE(LN,LN$):: LN$=CHR$(INT(LN/256))&
    CHR$(LN-256*INT(LN/256)) :: SUBEND
```

Enter MERGE DSK1.QUIZ/2 and SAVE the result as your completed QUIZWRITER.

This truly remarkable oneline disk cataloger tinygram by John Martin was published in the Jackson County newsletter.

```
1 IF F THEN INPUT #1:A$,A,J,K :: IF J THEN PRINT
    A$;TAB(12);J;TAB(18); SEG$(B$,ABS(A*2)+1,2);K;
    TAB(27);A<0 :: GOTO 1 ELSE RUN ELSE
    B$="AVDFDVIFIVPG" :: INPUT "DSK":F :: OPEN #1:
    "DSK"&STR$(F)&".",INTERNAL,RELATIVE, INPUT :: GOTO
    1 ! BY JOHN M
```

And an ingenious tinygram version of Wheel of Fortune, in the West Penn newsletter.

```
1 ! *** FORTUNE OF WHEELS **
    *      A TINYGRAM      *
    * by Mike & Ed Machonis*
    ************************
2 CALL CLEAR :: INPUT "ENTER THE MYSTERY PHRASE     ":M$
    :: CALL CLEAR :: L=LEN(M$)
3 D$=RPT$(CHR$(30),L):: FOR J=1 TO L :: IF
    SEG$(M$,J,1)<>" " THEN 4 ELSE D$=SEG$(D$,1,J-1)&"
    "&SEG$(D$,J+1,L)
4 NEXT J :: PRINT D$
5 T=T+1 :: PRINT :"TRY No.";T:;: :: INPUT "TYPE LETTER
    OR ENTIRE PHRASE":A$ :: IF LEN(A$)>1 AND LEN(A$)<L
    THEN 5
6 W=L+1-T :: IF A$=M$ THEN 9
7 FOR J=1 TO L :: IF SEG$(M$,J,1)=A$ THEN
    D$=SEG$(D$,1,J-1)&A$&SEG$(D$,J+1,L)ELSE 8
8 NEXT J :: PRINT :D$ :: GOTO 5
9 FOR J=1 TO M :: CALL SOUND(200+J,330+40*J,0):: NEXT J
    :: PRINT :"YOU WIN ";STR$(W);",000 WHEELS!":;: ::
    INPUT "PRESS ENTER TO PLAY AGAIN":G$ :: T=0 :: GOTO
    2
```

```
100 ON WARNING NEXT :: DISPLAY AT(3,10)ERASE
    ALL:"KALKULATOR":"":"Input 1st value and
    Enter.":"Input other values preceded":"by +,-,* or
    / and Enter." ! by Jim Peterson
101 DISPLAY AT(8,1):"Input = and Enter to get":"final
    result."
110 R=14 :: C=1 :: ACCEPT AT(12,1):N :: V=N :: F=1 ::
    N$=STR$(N):: GOSUB 200
120 ACCEPT AT(12,1) VALIDATE("+-*/=",NUMERIC):N$ ::
    A=POS("+-*/=",SEG$(N$,1,1),1):: GOSUB 200 :: IF A=0
    THEN 120 :: IF A=5 THEN 160
130 ON ERROR 140 :: N=VAL(SEG$(N$,2,LEN(N$)-1)):: GOTO
    150
140 CALL SOUND(200,110,5,-4,5):: C=C-LEN(N$):: DISPLAY
    AT(R,C):"" :: RETURN 120
150 IF A=1 THEN V=V+N :: GOTO 120 ELSE IF A=2 THEN
    V=V-N :: GOTO 120 ELSE IF A=3 THEN V=V*N :: GOTO
    120 ELSE IF A=4 THEN V=V/N :: GOTO 120
160 DISPLAY AT(R,C):STR$(V):: F,V=0 :: GOTO 110
200 DISPLAY AT(R,C):N$ :: C=C+LEN(N$):: IF C>20 THEN
    C=1 :: R=R+1 :: RETURN ELSE RETURN
```

Here is the world's shortest tic-tac-toe game, by R. Walters, converted to a tinygram by Jim Peterson.

```
2 DISPLAY AT(5,1)ERASE ALL:"LET'S PLAY TIC-TAC-TOE":
    :"THE BOARD IS NUMBERED:": :TAB(10);"1 2 3":
    :TAB(10);"8 9 4": :TAB(10);"7 6 5":
3 A=9 :: GOSUB 8 :: S=B
4 DEF F(X)=X-4+4*SGN(8.5-X)
5 C=F(S+1):: GOSUB 6 :: C=F(S+3):: GOSUB 6 ::
    C=F(S+6):: IF S/2=INT(S/2)THEN 7 :: DISPLAY
    AT(20,1):"I MOVE TO";F(S+4):"":"THE GAME IS A DRAW"
    :: STOP
6 A=C :: GOSUB 8 :: H=B :: IF H<>F(C+4)THEN 7 ELSE
    RETURN
7 DISPLAY AT(20,1):"I MOVE TO";F(C+4);"AND WIN!" :: END
8 DISPLAY AT(20,1):"I MOVE TO";A:"":"WHERE DO YOU MOVE
    TO?" :: ACCEPT AT(22,23) VALIDATE("12345678"):B ::
    RETURN
```

```
1 ! STRAIGHT-LINE CALCULATOR
    TINYGRAM by Jim Peterson
    Accepts input such as
    6+6-11*2+3/4
2 T,F=0 :: C$="+-*/" :: ACCEPT AT(12,1)ERASE ALL
    VALIDATE(NUMERIC,C$):F$ :: L=LEN(F$):: FOR J=1 TO L
    :: X$=SEG$(F$,J,1):: P=POS(C$,X$,1):: IF P=0 THEN 5
3 IF F=0 THEN T=VAL(SEG$(F$,1,J-1)):: F=1 :: A=J+1 ::
    P2=P :: GOTO 5
4 V=VAL(SEG$(F$,A,J-A)):: A=J+1 :: GOSUB 7 :: P2=P
5 NEXT J :: V=VAL(SEG$(F$,A,255)):: GOSUB 7 :: DISPLAY
    AT(12,L+1): "=";STR$(T)
6 DISPLAY AT(24,1):"PRESS ANY KEY" :: CALL KEY(0,K,S)::
    IF S=0 THEN 6 ELSE 2
7 IF P2=1 THEN T=T+V ELSE IF P2=2 THEN T=T-V ELSE IF
    P2=3 THEN T=T*V ELSE T=T/V
8 RETURN
```

That's all, folks!

TI-Writer Bug

by Jim Peterson, Tigercub Software, OH, USA

According to the TI-Writer Reference guide, page 77 when you select the Print File command, then type C space dskx.filename, any control characters with ASCII less than 32 are removed before the file is printed.

With FunlWriter, at least, this is not quite true. A carriage return character ASCII 13 or a line feed character, ASCII 10, at the end of a line is actually not deleted but is converted to the space bar character, ASCII 32. This may be proved by running this little routine:

```
100 DATA INPUT, OUTPUT
110 FOR J=1 TO 2 :: READ J$ :: DISPLAY AT(12,1)ERASE
    ALL :J$;" FILENAME?":"DSK" :: ACCEPT
    AT(13,4):F$(J):: OPEN #J:"DSK"F$(J),UPDATE :: NEXT
    J
120 LINPUT #1:M$ :: IF ASC(SEG$(M$,LEN(M$),1))<33 THEN
    M$=SEG$(M$,1,LEN(M$)-1)
130 PRINT #2:M$ :: IF EOF(1)<>1 THEN 120 :: CLOSE #1 ::
    CLOSE #2
```

Publications Library Report

with Warren Welham

Well I am back for another year and after 2 years of running the library it is now running smoothly, I think. In 1987, I improved the library as a whole. In 1988 I improved borrowing procedures and tried to help country members. Now in 1989 I hope to start and really get going a new section of the library. This section will include genuine Texas Instruments or 3rd party modules and tapes. These need to be donated by older members who have most of their modules on disk now anyway and therefore do not use their modules. For the club to keep going I think we should help and encourage new members who have only tape recorders and only a few modules. Therefore I urge all older members to dig out their old modules and tapes and donate them to the publications library, so new members can borrow them and improve their computer knowledge.

New Books arrived this month

Code	Title	Author
00307	Bumper book of lists and reviews	Peter Lynden
00308	Home Computer Mag. Vol.4 No.1	HCM
00309	Home Computer Mag. Vol.4 No.2	HCM
00310	Home Computer Mag. Vol.4 No.3	HCM
00311	Home Computer Mag. Vol.4 No.4	HCM
00312	Home computer Mag. Vol.4 No.5	HCM
00313	Home Computer Mag. Vol.5 No.1	HCM
00314	Home Computer Mag. Vol.5 No.2	HCM
00315	Home Computer Mag. Vol.5 No.2	HCM
00316	Home Computer Mag. Vol.5 No.3	HCM
00317	Home Computer Mag. Vol.5 No.4	HCM
00318	Home Computer Mag. Vol.5 No.5	HCM
00319	Home Computer Course No.6	Orbis
0*320	Goblin's Revenge	Pewterware
0*321	Up Periscope	Pewterware
0*322	Family Game Pack	Pewterware
0*323	Snow Trek	Pewterware
0*324	Bluegrass Sweepstakes	Pewterware

NOTE: A code which has an * in it means that this is part of the Genuine Tape and Module library and therefore has a Tape or a Module included.

New Arrivals of Overseas Publications

Group	Publications Name	Date
Melbourne TI99/4A Computer Enthusiasts	Melbourne Times	Oct 88
Channel 99 Hamilton	TI Focus	Nov 88
Hunter Valley 99ers User Group	Hunter Valley News	Nov 88
Tex-Comp	Mini-Mag 99	Apr 85
Micropendium	Micropendium	Oct 88
Micropendium	Micropendium	Nov 88
Micropendium	Micropendium	Dec 88
Brisbane User Group	Bug Bytes	Nov 88
San Diego Computer Society	-	Sep 88
San Diego Computer Society	-	Oct 88
North West Ohio	99'er News	Apr 87
Northern New Jersey	-	Oct 88
Northern New Jersey	-	Nov 88
Central Ohio Ninety Niners inc.	Spirit of 99	Oct 88
Central Ohio Ninety Niners inc.	Spirit of 99	Nov 88
Central Ohio Ninety Niners inc.	Spirit of 99	Dec 88
Ottawa TI99/4A Users Group	Newsletter	Nov 88
Club Information Montreal	Cim 99	Nov 88
Computer Base Lubbock	-	Nov 82
Computer Base Lubbock	-	Jan 83
Computer Base Lubbock	-	Feb 83
Computer Base Lubbock	-	May 83
Computer Base Lubbock	-	Jul 83

New TNDs arrived this month

Dec'88 Jan'89 Feb'89

Appeal: Anyone who has any computer magazines that have the TI99/4A in them and you do not use why not donate them. These magazines could include really old ones that were out in the TI99/4As heyday, like Compute or Computer and Video Games. These all featured the TI99/4A.

For Sale

1 TI99/4A beige Console with modulator, power supply, all manuals.
1 Cartridge Expander (Navarone)
1 TI Joy-sticks (pair)
1 TI Expansion Box + Interface Card and cable, supporting:
- 32K Memory Expansion Card
- RS232 Interface Card
- TI Disk Controller Card + book, Disk Manager Module.
- TI Disk Drive, SSSD
- Horizon RAMdisk Card (720 sectors).

1 12" monochrome (green) Monitor (Blue Chip) on swivel base

1 TI Terminal Emulator II -complete, brand new.
1 TI Editor Assembler, with original manual, diskettes and Module
1 Extended BASIC Module with original book
1 TI-Writer with original book, diskettes and Module.
1 TI Multiplan, with book, diskettes and Module

1 Personal Report Generator Module and manual
1 Personal Record Keeping Module and manual.
1 Adventure module + diskette
40+ Disks (used, some good programs)

*** Total price for the lot: $800 ono
*** Contact : H. Torres 042-286585

Trojan Horse

by Mike Dodd, LA 99ers, USA

BEWARE: Beware of the dreaded "Trojan Horse" programs.

These are programs that are designed to destroy data on your disks or destroy disk drives. They have been around for the PC/XT/AT computers for ages but are just now starting to hit the TI99/4A community. These programs usually come under the guise of a disk access program, such as a track copier or a sector editor program. (One could argue that if a supposed track copier eats your disk that is what you deserve but I will not get into that.)

You can sometimes identify these programs by the fact that they often instruct you to remove the write protect sticker from the disk. If a program says it reads only, then tells you to remove the write protect, they will eat it if it is unprotected and do nothing if it is.

These programs will also very often slam the heads against the casing of the drive. It can be done I assure you. I have done it myself at times. Needless to say this is not especially helpful for your disk drives particularly if the program does it rapidly at a fast rate.

So, as a general rule, for the first time you run a program, run it on a garbage disk and be ready with that off switch! I have never been bitten by a Trojan Horse program and if I can follow my own advice <ha!>, maybe I can keep that record intact.

Jenny's Younger Set

Dear Jenny,

I have one program here which is an improved version of one program I sent you in 1987. I hope you like it.

Vincent Maker

```
100 ATTEMPT=0
110 ALPHA=0
120 CALL CLEAR
130 REM IMPROVED GUESS A NUMBER/LETTER BY VINCENT MAKER
140 INPUT "WHICH ONE(NUMBER/LETTER)    WOULD YOU LIKE
    TO PLAY?":A$
150 IF A$="NUMBER" THEN 200
160 RANDOMIZE
170 A=INT(90*RND)+65
180 IF A>90 THEN 170
190 GOTO 460
200 CALL CLEAR
210 INPUT "WHAT NUMBER WOULD YOU TO    GUESS OUT OF (EG
    OUT OF 10)?":GUESS
220 CALL CLEAR
230 RANDOMIZE
240 G=INT(RND*GUESS)
250 INPUT "OK, WHICH NUMBER WOULD YOU  LIKE TO
    GUESS?":ANSWER
260 ATTEMPT=1+ATTEMPT
270 IF ANSWER=GUESS THEN 300
280 IF ANSWER>GUESS THEN 360
290 IF ANSWER<GUESS THEN 410
300 PRINT "CONGRATULATIONS, YOU GOT IT IN ";ATTEMPT;"
    GOS!!"
310 PRINT
320 PRINT
330 INPUT "WOULD YOU LIKE TO GO AGAIN(Y/N)?":D$
340 IF D$="Y" THEN 120
350 GOTO 120
360 PRINT "YOUR GUESS IS TOO GREAT, TRY GUESSING
    SMALLER."
370 FOR T=0 TO 500
380 NEXT T
390 CALL CLEAR
400 GOTO 250
410 PRINT "YOUR GUESS IS TOO SMALL, TRY GUESSING
    GREATER."
420 FOR T=0 TO 500
430 NEXT T
440 CALL CLEAR
450 GOTO 250
460 PRINT "TO GUESS LETTERS PRESS THE LETTER YOU WANT
    ON THE KEYBOARD.  THE COMPUTER WILL DO THE REST."
470 PRINT "PRESS YOUR GUESS."
480 CALL KEY(0,K,L)
490 IF L=0 THEN 480
500 ALPHA=ALPHA+1
510 IF K=A THEN 550
520 IF K>A THEN 590
530 IF K<A THEN 650
540 IF K>90 THEN 710
550 PRINT "CONGRATULATIONS, YOU DID IT IN ";ALPHA;"
    GOS!!"
560 INPUT "TRY AGAIN(FOR EITHER,Y/N)?":D$
570 IF D$="Y" THEN 100
580 END
590 CALL CLEAR
600 PRINT "TRY GUESSING NEARER THE START OF THE
    ALPHABET."
610 FOR Y=0 TO 500
620 NEXT Y
630 CALL CLEAR
640 GOTO 470
650 CALL CLEAR
660 PRINT "TRY GUESSING CLOSER TO THE END OF THE
    ALPHABET
670 FOR U=0 TO 500
680 NEXT U
690 CALL CLEAR
700 GOTO 470
710 PRINT "THAT IS NOT A LETTER. YOU ARE PENALISED ONE
    GO."
720 FOR T=0 TO 500        740 CALL CLEAR
730 NEXT T                750 GOTO 470
```

Congratulations, Vincent on your Certificate of achievement. Thank you for the program which looks like an interesting variation on the original one. I like these guessing games as even I can get them right sometimes!

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* Dictionary *

1 INTUITIVE	77 BELOW	153 PSYCHIC
2 RESET	78 MYSTERIO	154 NEWS
3 SAME	79 BUTTON	155 STYLE
4 WILL	80 CEILING	156 FLOOR
5 TREAD	81 DOWN	157 GROUND
6 KEYBOARD	82 FEEL	158 SCALE
7 WAY	83 AT	159 WALLS
8 DEGREES	84 HITTING	160 BIT
9 SHOOT	85 GEM	161 FOR
10 SANDMAN	86 AQUARIUM	162 IT
11 DESK	87 EYES	163 UNTIL
12 GO	88 ABOUT	164 AGAIN
13 HE	89 ROOM	165 NOW
14 RINGMASTER	90 ITEMS	166 COMPASS
15 SEE	91 DROPS	167 DROP
16 LIGHTLY	92 HER	168 ENTER
17 BY	93 STAT	169 TURN
18 KNOB	94 SOLVE	170 FLUID
19 LIGHTS	95 YOU	171 READ
20 PUT	96 LEAVE	172 STILL
21 TYPE	97 SETS	173 THERE
22 JUMP	98 SENSES	174 BEFORE
23 CAN	99 ASSETS	175 NEEDED
24 RESTRICTED	100 AFTER	176 SHOW
25 BROKEN	101 THEY	178 WHILE
26 MAKE	102 THE	179 IN
27 SKY	103 ASK	180 LATER
28 PENTHOUSE	104 SCORE	181 SAID
29 EVERTHING	105 SCAN	182 ACID
30 STOP	106 FRIEND	183 UNTIL
31 DOORS	107 ALSO	184 WEIGHT
32 FIND	108 CARBONATE	185 REMEMBER
33 BUT	109 HOLLYWOOD	186 FRAME
34 PRESENCE	110 CLOCK	187 FLOATING
35 50	111 CHEMICAL	188 PIECE
36 LOOK	112 AND	189 OUCH
37 ARE	113 OPEN	190 WHERE
38 SPIDER	114 LEAP	191 NOT
39 SHE	115 AN	192 ALL
40 THROW	116 4	193 PUZZLE
41 IS	117 ARMS	194 IMMEDIATE
42 HALL	118 INTO	195 BIO
43 STOP	119 SAYS	196 WEB
44 TALK	120 CALCIUM	197 MESH
45 METAL	121 HIM	198 MADAM
46 DIRECTIONS	122 WATER	199 BOTHER
47 AROUND	123 ILLUSIONS	200 LOWER
48 CHEMICALS	124 COUCH	201 SOMETHING
49 COMPUTER	125 OFF	202 WEST
50 MADAME	126 WAKE	203 RUN
51 WHY	127 PAPER	204 SNARL
52 SELF	128 THAT	205 ONE
53 ON	129 LAB	206 WHEN
54 BREAK	130 A	207 FAN
55 NEVER	131 FROM	208 MASTER
56 PUSH	132 ATTENTION	209 THINGS
57 EXAMINE	133 SEEM	210 OCK
58 CLOSE	134 SHAFT	211 SPIDER-MAN
59 WAIT	135 WHAT	212 WHO
60 TILL	136 UP	213 USE
61 HYDROMAN	137 THERMOSTAT	214 ASSET
62 TANK	138 IF	215 FORMULA
63 NEAR	139 MADE	216 GETTING
64 ETC	140 CHEM	217 CHECK
65 HIDDEN	141 ONLY	218 PRESS
66 OTHER	142 :	219 32
67 WHICH	143 REMOVE	220 PAINTING
68 THEN	144 CRIB	221 SIDE
69 OR	145 ,	222 YOUR
70 TIMES	146 START	223 CHLORIDE
71 ELEVATOR	147 DR	224 SAGAPLUS
72 SPEED	148 BUILDING	225 OF
73 TO	149 GRAB	226 ELECTRO
74 LIZARD	150 OUT	227 THINK
75 VERSION	151 DO	
76 GET	152 GEMS	

Newsletter Roundup

by Lou Amadio, Illawarra Regional Group

Quite a bundle of newsletters were received over the Christmas break (24!), so here goes:

Hunter Valley 99ers News, December 1988 - Call for buyers for the Quest RD200 RAMdisk board - $132 minus batteries and memory chips, "warning" of an 80 column word processor from Funnelweb, benefits of bulk donations for fairware authors (good idea), TI disk controller upgrade to access 4 drives and respond to lower case filenames, availability of MacFlix to view MacPaint files, a new assembler from JP Hodie called HACK, Tony McGovern reports of a bug with Myarc FDC and the Horizon ROS, review of "Protector 2" module with light pen, review of TI-Base by Jack Sughrue, comprehensive cassette tips for new users, Review of the Dijit AVPC 80 column card, Alan Franks reports availability of second hand MiniMemory and Editor Assembler modules.

TIUP Titbits November '88: bug report for PRBase by Bill Warren, tips on the use of PRBase, review of a new programming language called D-BASIC and notes on RAMdisk construction.

TIBUG January '89: Report that listing the club in the Telephone Directory was very worthwhile (note TIsHUG), Geneve Corner - lament for lack of support, advertisement on PrEditor from Asgard (a programmers editor), hint of a Kaleidawriter Data-bank for the TI99/4A which will give it a massive increase in speed (sounds interesting!), more on Press and finally a power-up device from Col Christensen designed to automatically switch a number of peripherals on (or off) at the same time.

Melbourne TIMES November '88: Editorial on the main supporters for the TI99/4A, extensive article on combining Assembly with Extended BASIC, hints on PRBase. December '88: A Multiplan tutorial from Peter Gleed and the story on Picasso and an important notice of a software/hardware competition for the TIMES TROPHY.

Overseas Newsletters

TI-SIG (San Diego) November, December '88: Various snippets of information about club activities.

Sacramento 99er Users November, December '88: 4 pages with miscellaneous information.

ROM (Orange County) Newsletter December '88: TI bits by Jim Swedlow hints on TI-Writer and other things, aligning decimal points with Extended BASIC and a Forth article by Earl Raguse.

The Tacoma Informer December '88: Miscellaneous ramblings from Jack Sughrue, Geneve Notes on hard disk usage and TI99/4A virus problems - how our computer is immune! January '89: Jack's notes again, article on 4A-Talk and start of a series on desktop publishing.

Northern NJ 99ers Group December '88: Letter on CorComp 512Kbytes card, 64Kbytes on 16 Bit Bus by Lou Amadio and Geoff Trott, Tigercub tips. January '89: Manipulating DV80 files by Art Byers, Creating Your Own Cursor in Extended BASIC (Bob Turner), Warren Agee's Firstbase database using IBM style commands, macros, large capacity, multiple keyword searches and maths functions, letter from a satisfied user, tips from J Peterson and a hardware article called a "Zenoboard" which is a PCB that is installed inside the console and supports the Extended BASIC chips, extra GROM chip sockets, 32Kbytes static RAM, clock and speech (some board! - TIsHUG should buy some).

Ottawa TI99/4A Users Group December '88: News of an all new disk manager called DM2000, review of Chicago TI99/4A Fair with 30 vendors and 500 paid attendees, availability of Hypercopy and Picture Transfer for the Geneve, also Batch-It and many others, Extended BASIC plus Assembly (part 2), Extended BASIC program to produce snowflakes (it was Christmas after all) and Steven Shaw's review of TI-Writer, MiniMemory and Editor Assembler. January '89: My Word tutorial, expanding Extended BASIC with Assembly, Fast Extended BASIC uses TI-Artist Instances, J Johnson BOOT program for the Horizon EPROM and an article on peripherals.

LA 99ers TopIcs Oct '88: Mention of "Printall" program and the Power of Relational Expressions from J Peterson, PC-Grid helps lay out print documents for easy 'what you see is what you get', a comprehensive TI-Base tutorial and Personal Finance Management by Bill Gaskill, a number of useful BASIC routines and Beginning Forth #6 on sound and music. December '88: An excellent article on Personal Financial Management by Bill Gaskill (part 2) using TI's HBM and HFD modules, TI-Base tutorial (part 2), Beginning Forth #7 on disk directories and music and page 22 has a list of software articles, with prices, and how to get them.

The PUG Peripheral November '88: Notice of ribbon re-inker for club use, suggestion that schools on tight budgets should use "TI99/4A computers that the owners have abandoned" (good idea TIsHUG), hint on printing graphics symbols using TI-Writer, P4 has an article on a power supply for a disk drive tester (future article for Techo Time?), more TI-Writer hints, Multiplan tutorial part 12 and Jack Sughrue's opinion of TI-Base "Exhilaration". December '88: Notes on Myarc's HFDC including hard disk formatting, tutorial on testing disk drives, putting up to 6 GROMs inside the console (by stacking over existing chips), part 2 of the TI-Base tutorial, Multiplan tutorial 13, TI-Writer tips on headers and footers and tips for beginners. January '89: Mention of all the new programs for the TI99/4A including Screen Dump V3.0, Graphix Label Maker, Print-It and Turbo Pasc99, continued tutorial on disk drives (part #5), Gary Taylors experience with the Myarc HFDC, Forth tutorial #5, TI-Writer part 12 on the transliterate command and a number of tips on DiskU, Funnelweb, TI-Writer and how to use the 17th! character set in BASIC - it is #0 of course!

SPIRIT of 99 January '89: Cassette files part 2 (by M Schmitt), TI-Writer tutorial part 14 (S Katzman), Disk Fix tutorial to help recover lost files, fixing glitched Extended BASIC programs and DV80 files, J Sughrue on "Adventuring", an interesting BASIC program which prints a MAZE to be solved and comments on the various drawing programs available.

CIM 99 December '88 : If you can read French, there are articles on TI-Base, Infidel and MacFlix.

TI FOCUS (Channel 99 Hamilton) December '88: Review of Chicago Faire by T Arnold with mention of Press, Dinosaurs, Beyond Video Chess, Olivers Twist, Quick Run (Extended BASIC fast loader) and RAM*BOOT, Advance BASIC and Pascal for Geneve, a review of Hypercopy for Geneve, PC Transfer review (TI <> IBM), all about MAX/RLE picture printing program and some excellent graphics produced by Jiffy Flyer. January '89: Page 4 has a call for Logo users with a Logo Dump program, Fastlane 1 (Assembly tutorial), an Extended BASIC printer character editor, review of Jiffy Flyer graphics printing program for notices and signs (excellent quality) and a short review of Form Shop allows insertion of graphics into text. o

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eventually developed by the data systems group, contains not a TMS9900 microprocessor but a microprocessor made by Intel. After the experience of the home computer, the TMS9900 was never seriously considered. And last November, at the Las Vegas electronics show, the several dozen engineers and marketing people in TI's large booth all wore buttons that showed they had learned another lesson from the TI99/4A. The buttons read, "Third Party Vendors Love TI". o

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Once the Board had sorted out who was doing what, it was time for volunteers to come forward for the various other jobs. No one came forward to take over the Editorship, so I was obliged to ask the meeting whether they supported providing the Editor with some equipment which would provide the most productive environment for the job. During the ensuing discussion I was most pleased that almost everyone who spoke was in favour of this and when Ben Takach (who spoke against my ideas at the previous two AGMs) supported me fully I knew I was going to be in harness for another year. I asked for a system with hard disk, 80 column card and Press and as Dick said at the time, the nature of the people who are members of TI99/4A user groups around the world was typified by the immediate offer by several members of equipment for me to use until the Board buys the equipment for the group. I have John Vandermey, John Paine, Lou Amadio and Ben Takach to thank for this. After all the positions were filled a general discussion followed as to where the group should head and the "problem" of other computers. It was good to have so many participate. I hope everyone might consider writing some ideas down and sending them to me so we can have a discussion over a wider forum.

****

Shortly, I hope, I will have a hard disk running, along with a Mechatronics 80 column card. I will then be able to tell you all about it. I have the 80 column card running on a system at the moment, but do not have useful software to warrant changing over to it. It also needs a suitable monitor. The one I am using (Taxan colour KS12R102S-A) is not quite good enough to take full advantage of the 80 columns (25 rows of 60 characters). There is a problem in using generally available monitors as the signals are all inverted and the sync signal is composite. I just need a bit of time to build an interface circuit to invert all the signals and separate the sync into horizontal and vertical. I have found that the 80 column card is a bit difficult to get started, and seems to need a reset after power is applied. It also needs a 9 volt external DC supply rather than a 6 volt one. To get the hard disk going, I first need to reduce the PE box voltages and then build a power supply for the hard disk. It is only a matter of time, as usual.

****

You may have been surprised (pleasantly I hope) by receiving two volumes of TND last month. I can assure you that the printery was also surprised and not very amused. However they did manage to cope and as we were early in giving the copy to them we were able to get it to you in time for the AGM. The printery can only fold 48 pages so that caused the bumper issue to become two, which, in the event, came out rather well we thought. This month we have some of the carry over from that issue.

****

I would like to thank Kevin Cox and John Ryan for their mail to me expressing their support for our views. It may seem that the Illawarra Regional Group is providing a lot of the horsepower for TIsHUG, with the Treasurer, Editor and Techo coordinator and there were only 3 of us at the AGM! Hopefully, the new Board will look at ways to make membership more attractive to those who are not able to attend the Sydney meetings. For example, I was in Adelaide for a week after the AGM and had a long chat with Fred Cugley, who is their long serving coordinator, organiser, secretary and so on. He said that everything relied on him to get going, as it had for a number of years. There must be other places who do not have someone as dedicated as Fred, but would like to have access to a user group which would provide them with the facilities they want at a reasonable price. One of the difficult things to organise is a newsletter, but this is the only real way to keep in touch. We have a good Newsletter which could be used by groups as a basis for their communications. We could publish group activities as we do for the regional groups at the moment and if we were to send two or three copies to such groups for them to copy as required and distribute to their local members, we may well encourage some of those to join TIsHUG. There must be some way that we can all help each other. User groups around the country cannot all have identical software and book libraries. If we can all cooperate then our efforts should be more productive in the long run. Perhaps the next Editor of the TND will be in Brisbane!

****

I have a list of things that I would love to investigate and solve if I had the time. Chief amongst them is a GROM emulator that would allow all the GROMs to be replaced with EPROMs without the delays required by GROMs. There are two main areas where I would like a speed increase. The first of these is Multiplan, which benefits quite well from the 32K RAM on the 16 bit bus, but also has 5 GROMS which must slow the operation down. The second area is the P-code card, which has 8 GROMs and which is a nice system but runs a bit slow to be vey useful. Not too many have the P-code card which means that this is of limited interest, but the GROMS are not part of the system GROMs so that it may well be easier to attack this one first. Of course I am not going to have much time so that these dreams will probably still be dreams at the end of this year. Still, it is the possibilities which keep me interested in the TI99/4A.

Programs from TI*MES Library

by Stephen Shaw, UK

>DAVID VINCENT1: Another UK programmer with some excellent games; CARFAX ABBEY is a 5th generation Hunt the Wumpus type maze game, with excellent graphics, many repeatable layouts, and machine code links, with SOURCE code supplied. Fun. Plus well put together Extended BASIC games: Taskforce (an amended version of Battleships), Snakes (and ladders), and Boxes (match the pairs game for the kiddies). Take a look at really good presentation.

>DISK UTILITIES V4.0a by John Birdwell. A very complete disk utility which now allows you to change the name of a file when copying (think carefully about this!), over-ride file protection of the destination disk, check free space on the destination disk before copying starts, sector edit changes in inverse to make them stand out, etc., etc. You may check a disk for bad sectors (non destructive) and mark out bad sectors from the bitmap without re-initialising the whole disk. Repartition a Myarc RAMdisk. Add comments to files, add date to disks. Excellent printout showing location of FDRs and each file segment. Phew!

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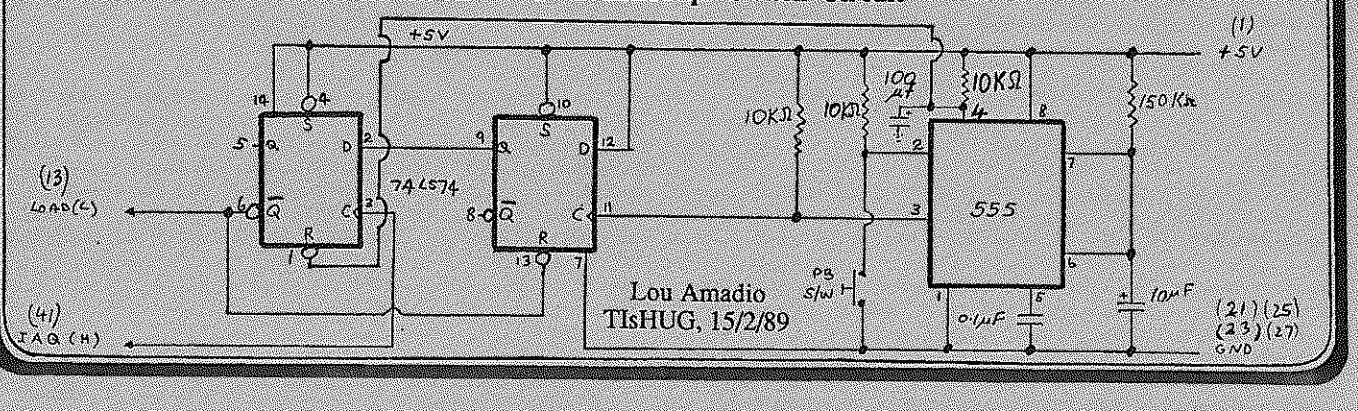
Reliable LOAD Interrupt Switch Circuit



Regional Group Reports

Meeting summary.

Banana Coast	12/03/89 Sawtell
Carlingford	15/03/89 Carlingford
Central Coast	11/03/89 Toukley
Glebe	9/03/89 Glebe
Illawarra	20/03/89 Keiraville
Liverpool	10/03/89 ???
Northern Suburbs	23/03/89 Davidson
Sutherland	17/03/89 Jannali

BANANA COAST Regional Group
(Coffs Harbour area)

Regular meetings are held in the Sawtell Tennis Club on the second Sunday of the month at 2 pm sharp. For information on meetings of the Banana Coast group, contact Kevin Cox at 7 Dewing Close, Bayldon, telephone (066)53 2649, or John Ryan of Mullaway via the BBS, user name SARA, or telephone (066)54 1451.

CARLINGFORD Regional Group.

Regular meetings are usually on the third Wednesday of each month at 7.30pm. Contact Chris Buttner, 79 Jenkins Rd, Carlingford, (02)871 7753, for more information.

Next meeting is on 15 March, at 79 Jenkins Road, Carlingford. Contact Chris Buttner. Ph 8717753 Starting time is 7.30pm. All welcome.

CENTRAL COAST Regional Group.

Meetings are normally held on the second Saturday of each month, 6.30pm at the Toukley Tennis Club hall, Header St, Toukley. Contact Russell Welham (043)92 4000

GLEBE Regional Group.

Regular meetings are normally on the Thursday evening following the first Saturday of the month, at 8pm at 43 Boyce St, Glebe. Contact Mike Slattery, (02)692 0559.

ILLAWARRA Regional Group.

Regular meetings are normally on the third Monday of each month, except January, at 7.30pm, Keiraville Public School, Gipps Rd, Keiraville, opposite the Keiraville shopping centre. Contact Bob Montgomery on (042)28 6463 for more information.

LIVERPOOL Regional Group

Regular meeting date is the Friday following the TIsHUG Sydney meeting at 7.30 pm. Contact Larry Saunders (02)644 7377 (home) or (02)759 8441 (work) for more information.

All Demo programs are subject to Air Mail from U.S.A. Still waiting for some

*** ALL WELCOME ***

March Meeting.
10th March 1989
Hans Zecevic
33 malinya Cres.
Moorebank 2170
600 8716.

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**********
*Demo Typewriter*
*Demo Batch-it  *
*Demo of Press  *
*Gram RAM Card  *
**********
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April Meeting.
7th April 1989
Cyril Bohlsen
4 Madeline St.
Northmead
639 5847.

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**********
* Demo P Gram Card *
*Beyond Video Chess*
* Demo Gram Ram    *
* More Press       *
**********
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May Meeting.
12th May 1989

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**********
* Demo Tod Editor*
* Legends II    *
* PrEditor UpDate*
* More Press with*
* 80 Column Card *
**********
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NORTHERN SUBURBS Regional Group.

Regular meetings are held on the fourth Thursday of the month. If you want any information please ring Dennis Norman on (02)452 3920, or Dick Warburton on (02)918 8132.

SUTHERLAND Regional Group.

Regular meetings are held on the third Friday of each month at the home of Peter Young at Jannali at 7.30pm. Group co-ordinator is Peter Young, (02) 528 8775. BBS Contact is Gary Wilson, user name VK2YGW on this BBS.

Current topics of interest include Multiplan and TI-Base.

TIsHUG in Sydney

Monthly meetings start promptly at 2pm on the first Saturday of the month that is not part of a long weekend. They are held at the Woodstock Community Centre, Church street, Burwood.

Regular items include news from the directors, the publications library, the shop, and demonstrations of monthly software. Meetings for the next couple of months are:

March 4 - Russell Welham will give a tutorial on using TI-Artist. Well worth seeing if you purchased a copy from the club shop last year. As well as this there will be a segment on accessing printer functions and fonts from TI-Writer. I also believe that a survey will be given out by the directors.

April 1 - Since this meeting is after noon, no April fools jokes will occur. At this meeting you can see a demonstration of Asgard's "Press" (see Feb TND, pages 39-41 for background), described as the ultimate word processor for the TI, and a tutorial on manipulating strings in Extended Basic.

Future meetings are May 6 and a full day workshop on June 3.

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Excellent program. Plus Q4CAT, which will read 4 disks and print the catalogues in 4 columns of condensed print.

>ENHANCED DISPLAY PACKAGE V2.2 from Paragon Computing, programmer C A Provance. True Freeware! IBM style, useful documentation on disk, after that you get what you pay for! Immediately usable and good demonstration program. This disk contains a program which places machine code utilities into memory for your Extended BASIC programs to use by means of CALL LINKs. There is a clock with alarm, windows, and display commands are amended for both 32 and 40 column screens. There are routines to save and load screen displays, PEEKV, GTEXT, and a much extended and useful CHRSET. Disk contains 15 pages of documentation and a good demonstration program. Important: EDP supplied by me is configured for 50 Hz mains: the clock/alarm runs quite accurately on 50 cycle mains. It will not run accurately on US 60 Hz mains. The electricity supply in the UK is required to maintain a short term frequency accuracy of 2%. This clock has been measured as better than .5%, well within supply constraints.

>FORTHOPS V2.1 by Bill Wedmore. Four disks. An operating system for Forth which enables you to load and run all your Forth material from simple menu choices. Includes some useful Forth utilities. Not so easy to use, requires some knowledge of Forth. This set can only be used on a system with two disk drives, and assumes your Forth disks are configured as SSSD. Amongst other things, this framework includes a specific "disk name" which the menu looks for to load a program, unlike TI Forth which just looks for a specific Screen number. Can handle 10 different "disk names" (0 to 9). 4 disks!!!