Officer's Corner

By Dan H.Eicher

Sorry, this issue is much later than I had hoped! Much has been going on, including the Cleveland MUG, and in fact, I'm getting a little on the burnt out side of doing a newsletter, it is my hope I can get someone else in the group to take over the task for a while!

Thanks to a very generous offer, we should be able to lower our copying cost of the newsletter GREATLY. This has been a major concern for me, as duplicating prices just keep going up and up.

Many groups are moving their newsletters to the web, while I still like getting a paper copy in the mail each month, it is something we should look at for the long term.

The Cleveland MUG was wonderful, and it was really good to meet a lot of friends. I went over with Mike Wright and we had a great time, the conversion didn't lapse into silence once, Mike is a fountain of TI knowledge.

This issue is mainly a NEWSLETTER, not much in the way of tutorials, but lots of news and tips! As you can tell, many people are still working many hours to contribute to the TI community. I recently received permission to reproduce Navarone Manuals, Digit AVPC manuals, Western Digital 17XX manuals and Yamaha 9938/58 manuals in electronic format, this

should help hackers that need technical information that is no longer available from "official" channels. This information will be converted to PDF and distributed to the TI community at no charge by CaDD electronics.

Trivia Question: What does CaDD in CaDD electronics stand for?

Answer: Mark's Van Coppenolle wife is Diane, and his two kids are Charles and Denise, hence:

(C)harles and (D)iane (D)enise == CaDD

Speaking of technical information Theirry Noulspikel http://www.nouspikel.com/ti99/titech.htm has put together a wonderful technical site for TIers. It has technical information the I have in about 20 different binders from as many different sources. Everything technical you would want to know about our machine! Check this one out!

Our next meeting will be September 19 at my house. I hope to have built Jeff Brown's Interrupt Module and demo it with ZT480! Hope to see you there.

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Review of the MUG99 TI show
By Charles Good

This event was sponsored by the two Cleveland TI user groups on June 1112, 1999. The location was the beautiful Spang Mansion just south of Hopkins International Airport. The building was in a wooded area and we could see rabbits hopping by and were told that deer lurked among the nearby trees. The Cleveland groups went all out to give everybody a good time. They almost emptied their treasury paying for table and chair rental, building rental, and free food. There was a free buffet Friday evening and a great after the show Saturday evening pizza party. Attendees didn't have to pay for anything.

There was no admission fee and no fee to those who wanted tables. I was told that 58 people put their names on the sign in sheet. One of the major reasons for attending this kind of event is to meet old friends. I met folks like Dave Szippl and Jim Krych whom I hadn't seen in several years and thought had left the TI community. Lots of people were literally giving away surplus TI equipment, and thankfully most of it was taken by those who could use it. I brought a very full carload of stuff to give away, donated by members of the Lima User Group who now rely on PC99 for most of their 99/4A activity.

There were two seminar rooms and sometimes there were simultaneous seminars, so I couldn't attend everything. However all the seminars are on video tape, available postpaid by sending $10 to Glenn Bernasek Secretary TIChips 13246 Harper Road Strongsville, OH 441363942 GBBasic@aol.com

Bruce Harrison entitled his seminar "The end of an era" meaning that he has decided not to write any more software for the 99/4a. He is doing this, he says, because there are too many different kinds of hardware incompatibilities and he is unable to test all possible hardware combinations. As an example he cited my Micropendium review of his TI Bingo program. In this review I stated that the program's speech doesn't work on my Geneve with a Rave speech card. Well, Bruce has neither a Geneve nor a rave speech card. Other examples he cited are: the initialization of chr$143 in some menu programs, the failure of boot tracking to work with several different hardware configurations, the fact that his software seems to work on some Geneves and not others, it works on some SCSI cards and not others, Geneves, Geneves fool his software into thinking there is an AMS card in the system, there is new German hardware which he doesn't have. Bruce declared that ALL HIS SOFTWARE IS NOW PUBLIC DOMAIN except his midi software. This is available for a price from Richard Bell <Swim4home@aol.com> who will also be SELLING REAL MIDI MASTER CABLES. These are important announcements!

One of the seminars was the "MUG Conference" moderated by Glenn Bernasek. This was a discussion of user group survival. Groups represented at this seminar included Southwest 99ers, Western New York, Chicago, CADD, Milwaukee, Lima Ohio, Greater Akron, and West Penn. Discussion included posting newsletters on the internet and archiving old software on CD rom in PC99 format or some other way to preserve it forever. Glenn announced that there would NOT be another MUG conference hosted by the Cleveland groups. This one emotionally and financially wore them out. (I personally know exactly how that works.)

That is why I am not doing another MUG conference in Lima. At the 1998 Lima MUG conference I and one other person were the only ones there from the Lima area!) Jim Krych <jwkrych@nznet.net> invited all of us to a "Classic game and computer show" at a nearby armory already scheduled for June 1011, 2000 sponsored by the local Atari user group. The event will be free because it is only costing $50 to rent the armory for 2 days due to Jim Krych's military connections. This is GOOD NEWS! I plan to attend. It was announced that the NEXT CHICAGO TI FAIRE will be November 6 at the Evanston Public Library. This is also GOOD NEWS!

Mike Wright did not have official seminar time but he did demonstrate PC99 and the latest version of his Cyc at his table. He told me that he may put out an interim release of PC99 (version 5.2?) which will include the John Guyon RS232 rom and disk controller rom. The all native Windows 9.x version of PC99 is still not ready for release, although it has been improved since its showing at Chicago last year. This PC99 version is currently very slow on a Pendium 100 machine.

Lew King demonstrated how the West Penn user group's web site can be read using Jeffery Brown's ZT480 software running on a 99/4A. This software emulates 80 columns on the 99/4A screen and seems to run much more smoothly (meaning it doesn't crash as often) than did Term 80.

I (Charles Good) demonstrated the TI74 and its PC Interface. This hand held basic programmable calculator is smaller than but functionally almost identical to the CC40. It uses a basic that is almost identical to TI extended basic. You can purchase a very reliable $10 cassette interface or $45 PC Interface that lets you load and save software to and from a cassette tape or the hard drive of your IBM computer. The TI74 is fully compatible with all hexbus peripherals. Unlike the CC40, you can still purchase the TI74 and its cassette or PC interfaces new. These TI74 products are available on the internet from www.hightechsolutions.com or telephone (360)653-1570.
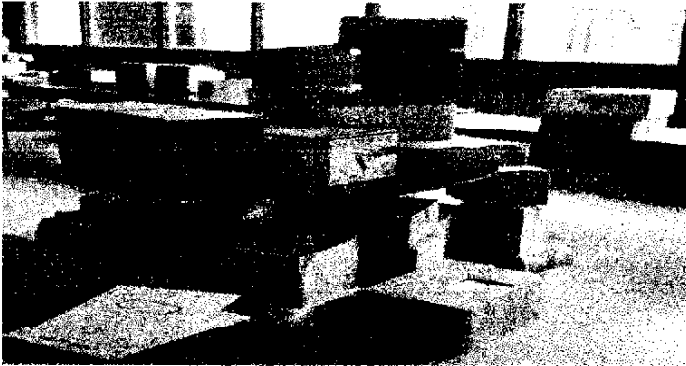
The show ended with the presentation of the Jim Peterson achievement awards. TI Chips announced that it WILL CONTINUE to sponsor these awards in the coming years.
This years recipients were:
Community Service SW99ers
TI99/4A Software .... Bruce Harrison
TI99/4A Hardware .... System 99 User Group (SNUG)
Geneve 9640 .... Tim Tesch

Western Horizon Technologies
11445 Clayton Road
San Jose, CA 95127
(408)259-4411 voice
(800)767-5665 toll free US (same)
(408)259-4441 fax

Our email, web and ftp site addresses will remain the same, and there should be no interruption in service. If you have any questions, feel free to email don@whtech.com

Thanks!
Don O'Neil
Western Horizon Technologies

World Wide 99 MAUG newsletter
By Ted Zychowicz

To All, among all the sad news I bring good news.:) Next week the World Wide 99 / Milwaukee Area User Group newsletter will be sent out to all persons who had requested it. Any bbs sysops please post on your bbs for download by persons who wish to get it. This month's newsletter will be sent in two parts. This is due to how long it is. Persons who have not requested it, please send your request to tedzy@prodigy.net.
Thank you
Ted

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2. Bruce Harrison
3. Glenn Bernasek
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5. Lew King with console interrupt module
6. A small portion of the giveaway items

WHT SCSI Update & Our Move
By Don O'Neil

I would just like to announce that all the fixes for all the revisions of WHT SCSI cards have been completed and tested by Michael Becker (Thanks Michael!) and that we will be beginning to send cards back in late July... why late July? Because we're moving July 1! It will take some time to set shop back up, make the mods and mail the cards out. Once all customer repairs have been sent out, new cards will be available for sale.

Please note our new address & phone number, as of July 1 1999:

HOOSIER USERS GROUP OFFICERS
Area Code (317)

President	Dan H. Eicher	862-1860
email: eicher@delphi.com		
Vice-President	Bryant C. Pedigo	255-7381
email: bpedigo@midlink.com		
Secretary/Treasurer	Greg Larson	783-4575
email: greg.larson@icsbbs.org		

Mr.Moon

By Mister Moon

Yes, I am indeed the 'Moon' of Moonbeam Software.

After a very, very long time away from the wonderful world of the TI994/A, I discovered this list and signed up a couple days ago. Although I really have little to offer the TI994/A community at this point (I don't even have a working PEB system, let alone any copies of the Moonbeam Software games), I thought it would be nice to listen in on what's happening with my favorite little computer.

I have a lot to learn (and relearn) about the TI99/4A and, hopefully, any questions that I pose to the list will not be too annoying.

As I have just joined the list I do not know what the acceptable etiquette is on this list so I will probably hang around a bit longer before I go posting any further messages...

Mr Moon
moonbeam@mrmoon.com
http://mrmoon.com

Editors Note: Mr. Moon had two unreleased games for the TI, Mike Wright is trying to retrieve them from a floppy sent to him by Mr. Moon [the only copy there is!].

PCode card Questions

Tim Stark wrote that he had a PCode card, but couldn't find the PCode diskettes any where. Mike Wright sent him the following reply:

Dear Timothy,

CaDD's records show that you are a legal owner of PC99 Stage 5 Full. This version includes the pCode card, thanks

to the generosity of the Regents of the University of California, San Diego (UCSD). Also, at this stage, I guess it is okay for CaDD to still take orders. We will of course try to treat customers the way we always have, with deference and respect, and to ship orders promptly (usually overnight). Therefore, it is possible to order from CaDD copies of the official TI disks PHD5063 through PHD5065 that were used on the pSystem. (Pricing can be found on the CaDD web page, at http://pw2.netcom.com/~mjmw.).

Not listed are the Freefrom spreadsheet disk, and the pSystem Word Processor, that I believe was the forerunner of TIWriter. (At least it has the same .XX command like structure).

CaDD never really promoted the following fact, but it has always been true. We tended to stress that the disk transfer utilities (RSECTOR and WSECTOR) were primarily used to transfer TI 5.25" disks from a TI to the PC for use with PC99. But, of course, they work equally well in both directions. So, someone who has the PC99 versions of the pSystem disks could easily make TI copies of them for personal use.

Actually, at one stage we tried to persuade people that it was easier to develop software under PC99 especially using the miniscreen debugger than it was on the 4A. The assembler runs much faster, and it is quite simple to create a large listing and then use dskout to read it at 80 cols in a PC editor in a window while you debug the code. When the code was complete, we suggested that there was a wider market for the programs by offering both versions after sending the disk to the 4A. Somehow, it never caught on.

Mike Wright
mjmw@ix.netcom.com
(for CaDD Electronics)

PCode Repair Tip

From Michael Becker

I have inspected a lot of Pcode cards, that people try to repair by using an 74LS245 for the busdriver, when it went bad. The original one is a 74SC245 from MITEL (obsolete since 10 years...) and is one of the first CMOSdevices.

Whenever your busdriver (databus) in your Pcode went bad, replace it with Nationals (Fairchild) or MOTOROLA's 74ACT245, nothing else! The replacement must be CMOS because of PMOS GROMS inside the cards, it must be ACT (not HCT) because of TTLdriving into the PeriBus of the PBOX, so it is a real level shifter. All other replacements (LS with Pullup) are "crocks" and may not work properly.)

Announcement

By Michael Becker

The SPVMC (Speech and Voice Memory Card) is already made. The first two cards are built for software developing. Some features of the card :
TMS5220 Speech Processor, nearly 95 percent compatible to TMS5200 (the old one from TI's PHP1500), he sound is a little bit different, but all words from the original Speech memories can be reproduced by the chip. TMS5200 was never available on the market (prototype, called CD2501 by TI).

New Vocabulary, nearly 450 new words, aeronautics, clock/time, industrial use in addition to the full set of words from TI's old Speech synthesizer.

We are currently working on a list of words, so the words can be accessed by CALL SAY too. But this is very difficult to do, needs a lot of works because all the

,words must be sorted in half alphabetical order (there is a special algorithm in CALLSAY to find the data very quick!). Full plugin card for the PBOX. All included.

Harald's FLASHDSR and FLASHVSM (voicememory) accessible with Haralds new DSRloader from V2.17 and higher.

Independent from the high price of the very high quality board (DM80, each!), the card is very low priced: DM 300, or $170, (!) We got a lot of parts very cheap, so we will give the price to all the members of our user group without additional charge. Full socketed with high quality gold socket contacts. Count: 28, nothing more! limited by the TMS5220.

BTW: if anyone has an damaged PHP1500, where the VSM's are defective, he may unsolder the CD2501 and place it into the SPVMC. Then he will have the old original speech sound. I know mostly the voice memories went wrong, never the CD2501. Simple Test for the Speech synthesizer PHP1500: If CALL SAY does not work, but PARSEC does, then the VSM's (or one of them) are defective (the doublepack near the connector).

Michael

P.S: will be available at Stutgart TI faire

Gifts to TIers
By Charles Good

The following interesting material has been placed in the /pub/pc99 directory of Don O'Neil's ftp server. It can be downloaded from the web with a browser or by using an ftp program with anonymous login. Don's ftp server is at ftp://ftp.whtech.com

99ER.EXE is a self extracting archive that contains all the TI software ever published by 99er Magazine/Home Computer Magazine/Home Computing Journal including the very very rare first and last issues. The file unpacks to 35 sssd "disks" in PC99 format. Disk conversions were done by Mike Wright.

AMNION.EXE is a self extracting archive that contains all the software of Guy Romano's "Amnion Free Access Library". This library includes all of the old IUG software library plus some additional material. The file unpacks into 58 mostly DSDD "disks" in PC99 format a well as a PDF version of the last IUG software catalog. Disk conversions were done by Charlie Good and the PDF file was created by Mike Wright.

PETERSON.EXE is a self extracting archive that contains Jim Peterson's public domain library of over 600 sssd and dssd disks. The archive includes a PDF version of the Peterson PD catalog and all the disks in PC99 format. The method of archiving lets you extract just the disks you want without having to unpack all

600+ disks. The disk conversions were done by Charlie Good. Creation of the PDF file and placing all the disks in an archive was done by Mike Wright.

LIMANEWS.EXE is a self extracting archive that contains most of the articles that were originally published in "Bits Bytes & Pixels", the newsletter of the Lima Ohio User Group. Most of these articles were original to the newsletter. They were written by Charles Good, Jack Sughrue, Bill Gaskill, Andy Frueh, and others. The archive unpacks into ascii *.txt files.

REVIEWS.EXE is a self extracting archive containing almost all of the Micro reviews articles Charles Good published in Micropendium from 1994 until 1999. The archive unpacks into ascii *.txt files

RXB.EXE is a self extracting archive containing RXB v2000 by Rich Gilbertson. This is the final version of this fine product. There will be no more updates according to the author. v2000 includes complete control of the AMS card from within basic as well as a disk manager that works with floppy HFDC SCSI and ramdisk drives. The archive unpacks into two PC99 disks (one of which is an AMS demo disk), the *.grm files needed to run RXB v2000 from PC99, and all the documentation as ascii *.txt files. Charlie Good converted the material to PC99 format and extracted the documentation so that it is easy to read by anybody with a PC.

In the near future I expect to be able to upload the Boston Computer Society's TI Sig disk library in PC99 format. The conversion of these 100+ disks were done by Mike Wright.

Some of the above archives are large, particularly the Peterson and Amnion libraries. The BCS archive will also be large. If you have a slow connection and don't want to download all this stuff you can snail mail me a zip disk and paid return mailer. I will put all the above files and the BCS library in PC99 format on your zip disk and mail it back to you.

If you want to receive the final update of RXB on TI disks you can snail mail me $2 and I will send you RXB v2000 on TI disks. Please indicate whether you have DSDD or only DSSD capacity. The original disks are on DSDD. You need a gram device, or a Geneve, or PC99 in order to run RXB.

Charles Good
P.O. Box 647
Venedocia OH 45894
Phone 4196673131
email good.6@osu.edu or cgood@nicsweb.com

Doom of Mondular Part 3 of 3
By Mike Wright of Cadd Electronics

Line 140: This time there is no new assembly language program loaded. To ensure that Basic is still set to ON BREAK NEXT there is a CALL LINK("BOOTER").

Line 161: The data in Z$ will become a FDR for the main Doom program with the name >13, >18, >0D. This string becomes:

Dec	Hex
019	13
024	18
013	0D
032	20
032	20
032	20
032	20
032	20
032	20
000	00
000	00
139	82

This FDR is not even stored on the disk at LOAD time. It gets created on the fly by the Basic code!

Line 163: Writes the FDR for the main program to sector 356.

Line 220: 10240 = >2800. The values stored there by BOOTER are 1B13180D. This CALL PEEK is setup to switch the values to 1B18130D which will become the new hidden filename.

20. DSK1.1B18130D

```
100 GOTO 110 !COPYRIGHT 1984 SYMBIOTECH,
INC. ALL RIGHTS RESERVED

110 ON BREAK NEXT::N$="DSK1."
120 ON WARNING NEXT
130 ON BREAK NEXT::N$=N$&"ZAPSDATA"
140 ON ERROR 200::CALL
LINK("BOOTER")::N$=N$&CHR$(16)&CHR$(17)::C
ALL LOAD(31806,16)
150 CALL PEEK(31952,A,B)::CALL
PEEK(A*256+B65534,A,B)::C=A*256+B65534
160 OPEN
#1:N$,UPDATE,RELATIVE,INTERNAL,FIXED 255
170 ON ERROR 220::INPUT #1,REC 34:Z$
180 ON ERROR
200::Z$=RPT$(CHR$(229),254)::CALL
LOAD(31806,16)
190 FOR R=355 TO 35::PRINT #1,REC
ABS(R):Z$::NEXT R
200 CALL INIT::CALL LOAD(31804,0,36)
210 RETURN NEXT
220 CALL PEEK(10240,A,B,D,E)::CALL
LOAD(C,9)::CALL LOAD(C+6,A,B,D,E,0)::ON
ERROR 210
230 RUN "DSK1.??????"
```

Line 170: Will call line 220 on any kind of error. Then inputs from record 34 (sector 35). But, this sector was not formatted on the original disk. If you had copied only the good sectors of the original Doom on to a freshly formatted disk, then sector 35 could be read and will not generate an error. If you did not have an original disk (i.e. no bad sector 35), then control will transfer to line 190.

Line 190: This is a really vicious piece of code. It fills sectors 36 to 356 with the value 229, effectively destroying the disk.

Line 220: 10240 = >2800. This reads in the hidden filename of the main program, 13180D. The FDR for this is now stored at sector 356 and its data chain points to sector 187.

21. Brute force reveals main program

Now it may seem obvious at this stage the direction things are moving in. However, we have the advantage of hindsight (which is nearly always 20/20). We had not yet figured out how the filenames were being set up in the assembly code or the way the Basic code constructed the FDR for the main program.

We had deduced from our dissection of the disk sectors that there were a large number of sectors starting at sector 187 (>BB) that contained Extended Basic code in I/V254 format. But, we couldn't find an FDR that pointed to this area. We search the entire disk for >BB but could not find a data chain pointer that would work. We now know that the FDR is constructed on the fly, but we didn't know that at the time. As a result, we resorted to some more brute force. We created another quick utility that simply dumped sectors in order. By inspection, we figured the Basic code ran from sector 187 to 355 and extracted these to DOS We also extracted one of our own programs, written many years ago, that was in I/V254 format. We stripped off our 256byte header, and then binary joined to the extracted Doom sectors. We were then able to run the PC99 iv2asc (Internal/Variable 254 to ASCII) on this file. Here, at last, was the actual main Doom program. The program is too long to list here. It had the standard ON BREAK NEXT stuff, but it seemed to consist mainly of XB SUB calls. It also used the prescan on/off commands (!@P+, !@P).

The following fragment shows the start of the program:
1 ON BREAK NEXT::GOTO 2 ! COPYRIGHT 1984 SYMBIOTECH, INC. ALL RIGHTS RES

2 ON ERROR 6::GOTO 3
3 ON BREAK NEXT::ON WARNING NEXT::GOTO 4
4 CALL LOAD(31931,194)::RANDOMIZE
100::OPTION BASE 1::GOTO 5
5 CALL CHARSET::CALL CLEAR::CALL
MAGNIFY::CALL CHAR::CALL PEEK::CALL
COLOR::CALL KEY::CALL DELSPRITE::CALL
SOUND::CALL SPRITE::CALL HCHAR
6 CALL ERR(EC,ET,ES,LN)::ON ERROR 7::CALL
INIT::RETURN
7 CALL INIT::CALL LOAD(31804,0,36)

100 SUB WIPEOUT
101 DISPLAY AT(14,1):""::DISPLAY
AT(4,13):""::DISPLAY AT(6,13):""::DISPLAY
AT(7,13):""::FOR X=9 TO 11::DISPLAY
AT(X,13):""::NEXT X
102 SUBEND

This program yielded yet another trick. XB requires Basic code to be followed by subprograms (SUB X, SUBEND). Also, if you use prescan, you must "declare" all your functions and variables outside of prescan. But, in the above code, where does the Basic program continue? It appears to contain standard declarations, and then will return to the title screen in line 7. The trick is that if you define a subprogram with the same name as an XB subprogram, you will replace the XB call with your own. Doom does this with its own subprogram called CHARSET. This is the real start to Doom.

In the main program itself there are other checks to ensure that the disk is as expected. If not, the programmer uses the ZAPSDATA FDR to wipe out the entire disk! The disk must be write enabled or the program will not run at all.

There are also other files opened, such as DOOMDATA, INITDATA and MONODATA, which contain the by now standard binary appendages. There is also a "real" ZAPSDATA file, which has the last two binary bytes reversed. In this file are keys to ensure the right file has been opened.

22. How Doom gets loaded. Note: all of the Basic programs set ON BREAK NEXT, ON WARNING NEXT, and ON ERROR.

DSK1.LOAD
Displays "PRESENTING". Executes RUN "DSK1.GAME".

DSK1.GAME
Sets N$="DSK1.ZAPSDATA(16)(17). CALL LOAD("DSK1.BOOT"). This assembly code sets up a user defined interrupt at >F000 which sets ON BREAK NEXT. Switches sector 63 into sector 1. Executes RUN "DSK1.0F0D".

DSK1.0F0D
Loads DSK1.TITLEDATA(16). Displays title screen. CALL LOAD("DSK1.BOOTS"). Sets up UDI at >F100. Switches sector 65 into sector 1. Executes "DSK1.120D".

DSK1.120D
Displays green screen with copyright message. CALL LOAD("DSK1.BOOTER"). Switches sector 59 to sector 1. Executes RUN "DSK1.1B13180D".

DSK1.1B13180D
CALL LINK("BOOTER"). Creates FDR for 13180D in Z$ and writes it to sector 356. Executes RUN "DSK1.1B18130D".

DSK1.1B18130D
CALL LINK ("BOOTER"). Uses ZAPSDATA to input record 34. Follows ON ERROR statement. Leads to RUN "DSK1.13180D". If record 34 is good, then wipes sectors 36356.

DSK1.13180D
Main program. CALL CHARSET is replaced by user subprogram. Restores original sector 1.

23. Running with PC99

Since the PC99 "disk" is fully formatted, Doom will fail

when it reads sector 35 and finds it good. Generally, a PC99 "disk" is never bad. We have not even explored the deliberate patching of a disk file to see what happens with the emulation.

So, our solution, was to make a new, trim version of Doom that could be looked at by a user, and modified if necessary.

From the preceding, you can see that an awful lot of time is spent on loading protective files and routines that have nothing to do with running the program. We took all of these and created DOOMLOAD_X. This contains only the "good stuff" from all the load programs. Then we created DOOMMAIN_X. This has all the prescan and variable declarations removed. During this process, we found a syntax error in the Basic code.

The problem with trying to be clever with things like ON ERROR, is that if you have a real error, you will never know. In the original file, in SUB LIGHT, line 603 reads:

```
603 IF ZL=0 THEN 605 ELSE RESTORE 601::
    FOR I=1 TO L::READ D,S,B,F::NEXT I
```

This is an illegal construct in XB. You cannot have a FOR loop follow a conditional statement.

24. Conclusion

First, it should be noted that we are unable to distribute this program since it is copyrighted code. However, if a PC99 user sends us a letter stating that they are the legal owner of this program, we will send that user a copy. Under US copyright law you are entitled to make backups of software that you own, even if it is protected.

Second, it seems a great pity that such a programming talent focussed more on protection code than real, useful, program code. It also underlines the fact that given enough

time and determination, almost any software protection scheme can be broken. So, why bother in the first place?

It should also not be construed that we understand how everything was put together. Constructing the Doom disk must have been a nightmare. The only way we think it may have been done was to use something like an Advanced Diags script. But the total dependence on what amounted to hard coded sector 1's, must have made software maintenance really difficult. The use of ON ERROR was overdone to the point where errors in the code became undetectable (or was that a final test?).

We also think this exercise shows the strength of the PC99 utilities. Being able to extract large Basic programs into DOS and then using an editor such as Brief made the task of finding things like which files were being opened so much easier than using TI utilities.

Finally, we would like to thank Dan Eicher for sending us this disk. It consumed three weeks of our life, contributed to some more hair loss, and left us with the feeling that our time should be put to better purpose. As a result, we have started a letter to Dan which gives our new address as:

c/o The North Pole...
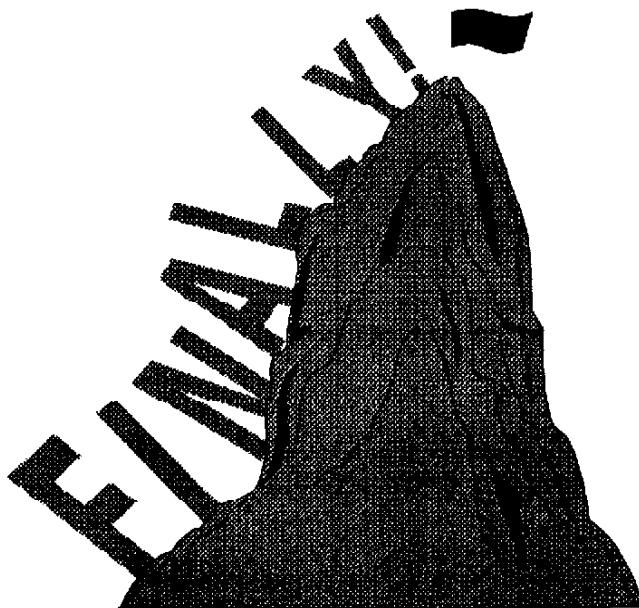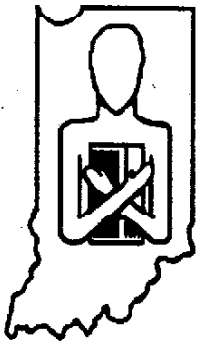
Hoosier Users Group
Dan H. Eicher
4509 Northeastern Ave.
Indianapolis, IN 46239

Forwarding and Address
Correction Requested

Next meeting September 19!!

Hoosier Users Group S&T BBS
300/1200/2400/4800/9600 Baud 8N1
317-782-9942   24 Hours Daily

APPLICATION FOR MEMBERSHIP

Below you will find an application for membership in the Hoosier Users Group. Active membership entitles you to the Newsletter, up and down loading rights on the HUG bbs, attendance and voting rights at regular club meetings, access to the HUGger Library of Programs, special club activities and special guest speakers for one year.

New memberships and renewals are $20.00/year. Make check or money order payable to Hoosier Users Group. Send completed application to: Hoosier Users Group
Dan H. Eicher
4509 Northeastern Ave.
Indianapolis, IN 46239

Cut on Line

Name: _____

Address: _____

City, State, Zip _____

Phone: _____ E-mail: _____