

# THE PUG PERIPHERAL

THE MONTHLY NEWSLETTER OF THE  
PITTSBURGH USERS GROUP  
SEPTEMBER, 1988

CLUB NEWS BY GARY TAYLOR

I WILL BE DEMONSTRATING THE TI-ARTIST DISK THAT I RECEIVED FROM INSCEBOT INC. DURING MY CLASS AT THE NEXT MEETING. THIS WILL BEGIN A SERIES OF CLASSES ON THE VARIOUS GRAPHIC PROGRAMS THAT ARE AVAILABLE FOR THE TI-99/4A. THEY HAVE ALSO PROVIDED ME WITH THEIR ARTIST EXTRAS DISK AND THEIR DISPLAY MASTER PROGRAM. THESE WILL BE DEMONSTRATED AT THE GENERAL MEETING. THESE PROGRAMS, INCLUDING THEIR NEW DATA BASE PROGRAM CALLED TI-BASE, WHICH WAS DEMONSTRATED AT THE LAST MEETING, WERE DONATED TO THE CLUB BY INSCEBOT INC. AND WILL BE USED AS PRIZES IN OUR BINGO GAME IN THE COMING MONTHS. INSCEBOT INC. IS GIVING OUR USER GROUP A 20% DISCOUNT FROM THE RETAIL PRICE OF THESE FINE PROGRAMS. THE ORDER FOR THESE PROGRAMS WILL BE PLACED AFTER THE MEETING, SO THOSE OF YOU WHO SIGNED UP FOR THE TI-BASE PROGRAM PLEASE BE PREPARED TO PAY THE TREASURER FOR THEM.

JIM PETERSON HAS SENT US A DISK OF TIPS FROM THE TIGERCUB THAT WE WILL BE PUBLISHING IN FUTURE ISSUES OF THE PERIPHERAL. SO BE LOOKING FOR "TIPS" NUMBERS 46 THRU 54. ALSO INCLUDED ON THE DISK IS HIS SOFTWARE CATALOG NUMBER 8. ANYONE INTERESTED IN OBTAINING THIS CATALOG CAN GET A COPY AT THE MEETING BY BRINGING A BLANK DISK TO COPY IT ONTO.

## NEW RELEASES

J. PETER HODDIE HAS RELEASED TWO NEW PROGRAMS. THE FIRST HE CALLS MACFLIX. THIS PROGRAM ALLOWS ONE TO VIEW MACPAINT IMAGES ON THEIR TI-99/4A OR THE MYARC 9640. THE MACINTOSH MACPAINT PROGRAM CAN CREATE IMAGES IN FULL 8 BY 10 INCH FORMAT. THIS NEW PROGRAM WILL GIVE YOU THE POWER TO VIEW, PRINT, AND SAVE THE IMAGE IN DV80 FORMAT. INCLUDED IS THE ABILITY TO INVERT THE IMAGE. WHEN VIEWED BY THE 9640, HI-RES GRAPHICS ARE USED AND THE 9649 CAN DISPLAY MORE THAN A STANDARD MAC SCREEN. IT CAN SAVE IMAGES IN MY-ART FORMAT TOO! HE HAS RELEASED THE PROGRAM THROUGH GENIAL SOFTWARE AT P.O. BOX 183, GRAFTON, MA 01519. THE PRICE IS \$15.

THE SECOND PROGRAM HE CALLS THE JPH ASSEMBLER HACK AND IT IS AN ASSEMBLY LANGUAGE PROGRAMMERS TOOL. IT RUNS ON THE 9640 AND THE 4A WITH A SUPERCART. IT IS A NEW ASSEMBLER! IT CONTAINS FEATURES TO PRINT OUT ASSEMBLER ERRORS AND THE ABILITY TO PAUSE THE OUTPUT BEFORE IT SCROLLS AWAY. SINCE I HAVE NEVER RUN THE TI ASSEMBLER MYSELF, I HAVE TO LEAVE THE OPINION OF ITS WORTH TO THOSE THAT HAVE. HE HAS RELEASED THIS PROGRAM AS FAIRWARE AND HAS UPLOADED IT TO DELPHI AND GENIE. IF YOU DO NOT HAVE ACCESS TO THESE INFORMATION SERVICES, SEND HIM A SELF ADDRESSED, POSTAGE PAID DISK MAILER, AND IN HIS WORDS "IF YOU ARE FEELING GENEROUS THE \$10 FAIRWARE PAYMENT", AND HE WILL SEND IT TO YOU. YOU CAN WRITE HIM AT 12 PAUL REVERE ROAD, LEXINGTON, MA 02173.

## FAIRE SCHEDULE

IT'S TI FAIRE TIME AGAIN. THE FIRST OF THE NEW SEASON WILL BE IN SEATTLE ON FRIDAY AND SATURDAY SEPTEMBER 23-24. DOORS OPEN AT 9:00 AND IS BEING HELD AT THE SEATTLE CENTER, SNOQUALMIE ROOM.

CLOSER TO HOME, THE CENTRAL PENNSYLVANIA 99/4A USER'S GROUP WILL BE HOLDING THEIR TI FAIRE NEAR HARRISBURG ON OCTOBER 16 FROM 7 A.M. TO 2 P.M. AT THE CARLISLE FAIR GROUNDS IN CARLISE, PENNSYLVANIA. IF YOU WANT TO GO TO THIS ONE CONTACT MICKY AS SHE SEEMS TO BE CO-ORDINATING TRANSPORTATION TO THE FAIRE. THERE IS A \$3 OR \$4 GATE CHARGE AT THE FAIR GROUNDS.

THE CHICAGO FAIRE WILL BE HELD ON NOVEMBER 12, SATURDAY, AND THE MILWAUKEE FAIRE WILL BE THE NEXT DAY ON NOVEMBER 13, SUNDAY. THIS WILL BE THEIR 6TH ANNUAL FAIRE AND WILL BE HELD IN ROLLING MEADOWS, ILLINOIS THIS YEAR. SEVERAL OF US USUALLY GO TO THE CHICAGO FAIRE AND IT HAS BEEN WORTH GOING TO.





# HARDWARE NEWS

DISK DRIVES (PART 1)  
by John F. Williforth

## RECAP OF MINUTES OF AUG 21, 1988

Meeting called to order by V. Pres. Alexander at 6:05 P.M.

Treasurer Shoemaker gave a Report. He has started a "Would like to Buy & Sell" book for use of our members to inform each other of surpluses & needs. Librarian Harper gave her Report. There are many new disks in the Library some of which are Investment Record and Addresses for use with PR Base, 3 disks of Funnelweb 4.11, 1000 Words, Lotto Number, Concentration, a TI graphics program and a new version of Archiver 3.

SYSOP Kelly reported that the BBS is running well. At that time, there had been 1100 calls from all over the U.S. 67 users had registered as of that time. The BBS will hold off going to a new program at this time because there is no need. Even on a power failure, our present program will re-boot itself. Archiver 3 is available for downloading from the BBS. It is not compressed.

Newsletter Editor Bucher reported that the quality of printing of the July-August newsletter was not up to par because the Printer's press had broken down. She promised that the quality would be back to normal in the next issue.

V. Pres. Alexander gave his Report:

He has a letter from a Company which offers to register programs for a cost of \$35.00.

Disk with a Woodstock story on it was distributed to Members for a special price of \$1.00. The author suggests that a contribution for use of the program be sent to Sister Pat Taylor, BVW; 1050 Carmel Dr.; Dubuque, Iowa.

### OLD BUSINESS:

Purchase of a machine for re-inking printer ribbons was discussed again. 11 members said they would be interested. Since different adapters will be required to fit different ribbons, a paper was circulated so that members could list the kind of printer for which they would be re-inking. Matter will be discussed at the next Board meeting.

Two TI Writer books were ordered & never picked-up.

There was no New Business.

Rings was played for the raffle. John Drenna won a single-sided drive.

The following demonstrations were given:

Gene Kelly--TI Base, version 1.0. It uses X-Basic and consists of 2 disks. It can be purchased through the PUG at a discounted price of \$21.45 incl. shipping charges.

Scott Coleman--a Fort 1 card which plays classical music.

Meeting adjourned at 8:00 PM.

Respectfully Submitted

Herbert H. Reich, Recording Secy.

The primary parts of a computer system are Arithmetic Logic Unit, Memory, and I/O. The ALU does the ADDING, the MEMORY holds the program and data, and the Input/Output section enables the computer to accept the program, data, and do something useful with the results.

Early computers were BIG, COSTLY, and SLOW (compared to today's machines). One of the major limitations for any computer over the last forty years has been the cost of the storage of programs and data within the computer (internal memory). Many companies have, in order to lessen this cost, experimented with new memory technology, wire loops, ferrite cores, short and long rcds, bubble and many others. While this was going on, the computer could not wait, and as a result, external storage (memory) was developed. Some external memories are the Write-Once-Read-Many (WORM) storage devices, paper tape, punch cards, and even today's Laser Disks (optical). This was fine because when you moved this data or program to a place outside the computer, where you needed it less frequently you could have more of that valuable space in the computer's internal memory for the things you do all the time in a computer, like keep track of the clock so that you will know when to go home.

This brings me to another type of external storage (memory), the Write-Many-Read-Many (WORM) devices, among these are the various types of magnetic tape drives, and the most used by you computer enthusiasts, the DISK drive. I would like to take several months to get into how a disk drive does what it does, how it interfaces with the computer, and how the STANDARD (Hic!) disk operates in its job as an external extension of internal memory. I would like to show you how to build a simple stand alone disk exerciser/tester to give you as individuals, or as a group the knowledge and a tool to fix your drives no matter what computer you use.

Let's start with the basics. A disk is an electro-mechanical device which can store data/program information in an orderly retrievable fashion. What good is it if you can't find it? The amazing part is that disks are able to transfer data to/from disk at rates above 5 million bits per second. Of course the floppy disk we will be talking about will be in the neighborhood of about 125 to 250 thousand bits per second (15K to 30K bytes per sec) max. Well don't expect that long program to load into memory in just 2 or 3 seconds, not unless your disk is on a Direct Memory Access channel, where data goes directly from your disk to the proper memory locations without the CPU having much to say about it. The reason some systems run much faster than others is because engineers use more expensive hardware innovations (features).

For the most part the average floppy disk is running on an interrupt basis with the Processor doing it's part in making sure each Byte of data going out to the disk is fetched from proper memory locations, and each byte coming in from the disk goes into the proper memory location. The CPU has a lot of other things to do as the transfer is taking place, and therefore usually data is handled in small blocks (256, 512, or 1024 bytes per block).

But we'd better start to share a little of the credit for the burdensome task of keeping track of where we are and where we're going to on the disk with the Controller. Sounds like a pretty important person. The CPU doesn't know what a disk is, let alone how to talk to it, thus the controller's job is to interface the CPU to the various disks that can be attached to the computer. It has many tasks to do depending on the type of system we are dealing with. Some have no resident software or the intelligence to use it if it did have it (kinda like me), and others have processors, ROM, and RAM as well as DMA channel interfacing.

I'd like to cover more, but keeping each article to one page almost assures me of getting this series into this newsletter each month. I know that I've been pretty broad in my approach here, but maybe all of this generality has given you one clear thought to start our discussion on DISK drives. Next month I'm going to skip ahead of myself and present you with a Stand-Alone Disk Exerciser and Tester unit. This will be the primary tool for our learning to fix a disk drive.



FROM : THE V.P.'S TERMINAL  
 TO : ALL READERS  
 GUDJ : HINTS THOUGHTS  
 DATE : SEPTEMBER 1988

This month I have a couple of hints and also I have a review of Supertrace by Jim Peterson of TIGERCUB.

My first hint for this month is a call load that will erase a program from memory. This call load can be used instead of end or stop in your program. The CALL LOAD is (-31952,255,231,255, 231).

My second hint is the way to use some call loads in Ti Basic. Follow the steps below.

1. Either insert EA (Editor Assembler) or MM (Mini Memory) in the cartridge slot.
2. Select Ti Basic
3. Type in CALL INIT
4. Then continue with call loads YOU WISH TO USE.

WARNING : ONLY SOME CALL LOADS WILL WORK IN BASIC.

I recently received a copy of the program called Supertrace by Jim Peterson of Tigercub and in my opinion the program is an excellent tool for the programmer or the hacker. Please bear with me as I explain the features of this program. The first feature of this program and main one is it's use. The program will help you with your problem program by allowing you to execute your program line by line for debugging purposes. Another feature of this program allows you the choice of keycode that allows line by line execution or no interruption or allows the execution of the program until you hold down any key. There are some prerequisites before using this program which include resequencing the program you wish to use Supertrace Program with to 100,20 and saving as merge file. Below I have a sample program that I used for this review. It is small so try typing it in.

```
10 CALL CLEAR
20 A$="FFFFFFFFFFFFFFF"
30 CALL CHAR(128,A$)
40 CALL COLOR(13,5,5)
50 CALL VCHAR(7,15,128,8)
60 CALL VCHAR(7,16,128,8)
70 CALL VCHAR(9,14,128,10)
80 CALL VCHAR(9,17,128,10)
90 CALL VCHAR(7,12,128,3)
100 CALL VCHAR(9,13,128)
110 CALL VCHAR(9,19,128,3)
120 CALL VCHAR(9,18,128)
130 GOTO 130
```

Before we go to Supertrace we have some prerequisites to do.

1. Resequence the sample program to 100,20
2. Save DSK1.GIANT1,MERGE

Now let's go through the Supertrace program step by step using my sample program as an example.

1. Load and run Supertrace from Ext. Basic environment.
2. Enter the input filename as "DSK1.GIANT1"
3. Enter the output filename as "DSK1.GIANT2"
4. Enter "Y" to break all lines.
5. Enter 1 to trace to, this allows tracing to screen
6. Enter 2 to codekey, this allows line by line execution of program.
7. Now sit back and allow the program to proceed on it's own
8. At the program end, type NEW
9. Type in MERGE "DSK1.GIANT2"
10. Type RUN and watch what it does.

I hope you like this program as much as I did. Now where can you obtain this Fairware program? First from club's library or from listing provided on next page.

(continued from page 4)

```
256*INT(LN/256))&E$ :: PRINT
  #2:P#
720 LN=30005 :: 60SUB 740 ::
  PRINT #2:LN#&CHR$(168)&CHR#
  (0):: PRINT #2:CHR$(255)&CHR#
  $(255)
730 CLOSE #1 :: CLOSE #2 ::
  DISPLAY AT(12,1)ERASE ALL:"E
  nter NEW": "Then Enter":
  MERGE DSK"KOF# :: END
740 LN#CHR$(INT(LN/256))&C#
  R$(LN-256*INT(LN/256)):: RET
  URN
750 IF LEN(M#)>150 THEN 770
  :: PRINT #2:SEG$(M#,1,2)&C#&
  CHR$(LEN(STR$(LN)))&STR$(LN)
  &K#&S#&SE5$(M#,3,255)
760 DISPLAY AT(12,19):LN ::
  RETURN
770 PRINT #2:SEG$(M#,1,2)&C#
  &CHR$(LEN(STR$(LN+1)))&STR$(
  LN+1)&K#&E#
780 DISPLAY AT(12,19):LN
790 LN=LN+1 :: PRINT #2:CHR#
  (INT(LN/256))&CHR$(LN-256*IN
  T(LN/256))&SE5$(M#,3,255)::
  DISPLAY AT(12,19):LN :: LN2=
  LN :: RETURN
800 PRINT #2:SEG$(A$,1,2)&C#
  &CHR$(LEN(STR$(LN)))&STR$(LN)
  )&K#&S#&SE5$(A$,3,255)&E$ ::
  DISPLAY AT(12,19):LN :: RET
  URN
```

## SUPERTRACE

```

100 REM PUBL. MICROpendium M
AY 1988 :: All rights belong
to Jim Peterson (Tigercub S
oftware)
110 GOTO 150
120 SET,C%,END%,Z%,E%,K%,S%,
K,S,IF%,OF%,O%,FL,TL,M%,LN,L
N2,P,T,LN%,A%,R%,Q%,PD%,KC
,K%
130 CALL CHAR :: CALL CLEAR
:: CALL COLOR :: CALL SCREEN
:: CALL KEY :: CALL SOUND
140 !P-
150 CALL CHAR(94,"3C4299A1A1
99423C"):: CALL CLEAR :: FOR
SET=1 TO 14 :: CALL COLOR(S
ET,13,15):: NEXT SET :: CALL
SCREEN(13)
160 C%=CHR$(157)&CHR$(200)&C
HR$(1)&"A"&CHR$(183)&CHR$(20
0):: END%=CHR$(255)&CHR$(255
):: Z%=CHR$(131)&CHR$(147)&C
HR$(154)&CHR$(163)
170 E%=CHR$(0):: K%=CHR$(182
):: S%=CHR$(130)
180 DISPLAY AT(2,5)ERASE ALL
:"TIGERCUB SUPERTRACK": ""
Tigercub Software for free":
"distribution but no price o
rcopying fee may be charged"
!programmed by Jim Peterson
1/88
190 DISPLAY AT(8,1):"Howeve
r, if anyone should feel a
nnoyed to send me a few bucks
for the use of this progra
m, I would not be"offended
!"
200 DISPLAY AT(15,1):"Jim Pe
terson": "156 Collingwood Ave
.": "Columbus, OH 43213"
210 DISPLAY AT(23,8):"PRESS
ANY KEY" :: DISPLAY AT(23,8)
:"press any key" :: CALL KEY
(0,K,S):: IF S=0 THEN 210
220 DISPLAY AT(2,1)ERASE ALL
:" Will break each program":
"line into single statement"
:"lines, unless they contain
"
230 DISPLAY AT(5,1):"an IF,
and add a CALL to a": "subpro
gram which will": "display ea
ch line number in": "the corn
er of the screen as"
240 DISPLAY AT(9,1):"it is b
eing executed, or": "will out
put it to a printer."
250 DISPLAY AT(13,1):" Progr
am must first be -: "RESeq

```

```

uenced to great in-": "cremen
ts than the number"
260 DISPLAY AT(17,1):"of sta
tements in any one": "line. (
recommend RES 100,20)": "an
d SAVED by": " SAVE DSK(file
name),MERGE"
270 DISPLAY AT(23,8):"PRESS
ANY KEY" :: DISPLAY AT(23,8)
:"press any key" :: CALL KEY
(0,K,S):: IF S=0 THEN 270
280 DISPLAY AT(23,8):"PRESS
ANY KEY" :: DISPLAY AT(23,8)
:"press any key" :: CALL KEY
(0,K,S):: IF S=0 THEN 280 EL
SE CALL CLEAR
290 DISPLAY AT(3,1):"INPUT F
ILENAME?": "DSK" :: ACCEPT AT
(4,4):IF% :: ON ERROR 300 ::
OPEN #1:"DSK"&IF%,INPUT ::
GOTO 310
300 CALL SOUND(300,110,0,-4,
0):: DISPLAY AT(6,1):"CANNOT
OPEN FILE!" :: RETURN 290
310 DISPLAY AT(4,1):"OUTPUT
FILENAME?": "DSK" :: ACCEPT A
T(7,4):OF% :: ON ERROR 320 ::
OPEN #2:"DSK"&OF%,VARIABLE
163,OUTPUT :: ON ERROR STOP
:: GOTO 330
320 CALL SOUND(300,110,0,-4,
0):: DISPLAY AT(9,1):"CANNOT
OPEN FILE!" :: RETURN 310
330 DISPLAY AT(9,1):" Progra
ms of more than 50": "sectors
in length may become": "too
long to run if you break": "a
nd trace all lines."
340 DISPLAY AT(15,1):"Break
all lines? (Y/N)" :: ACCEPT
AT(15,24)SIZE(1)VALIDATE("Y
N"):O% :: IF O%="Y" THEN 370
350 DISPLAY AT(17,1):"From 1
ine?" :: ACCEPT AT(17,12)VAL
IDATE(DIGIT):FL
360 DISPLAY AT(17,18):"To?"
:: ACCEPT AT(17,22):TL
370 DISPLAY AT(15,1):"TRACE
to 1": "" (1) Screen": (2)
Printer": (3) Both" :: ACC
EPT AT(15,10)SIZE(-1)VALIDAT
E("123"):O% :: IF O%=1 THEN
390
380 DISPLAY AT(21,1):"Printe
r? PID" :: ACCEPT AT(21,10)S
IZE(-18):PD%
390 DISPLAY AT(3,1)ERASE ALL
:" Key code 1 allows the pro
-": "gram to run until you ho
ld": "down any key. It will b

```

```

e"
400 DISPLAY AT(6,1):"difficu
lt to execute CALL": "KEYs in
the program.": "" Key code
2 requires a key": " to be p
ressed to execute"
410 DISPLAY AT(11,1):"each p
rogram line. You can": "step
through the program": "line b
y line, but this may": "be ve
ry slow if all lines"
420 DISPLAY AT(15,1):"are be
ing traced.": "" Key code 3
does not allow": "stopping t
he program."
430 DISPLAY AT(20,1):"Key co
de? 1" :: ACCEPT AT(20,11)SI
ZE(-1)VALIDATE("123"):KC
440 IF KC=1 THEN KC%=CHR$(19
1)&CHR$(192)&CHR$(200)&CHR$(
1)&"0" ELSE KC%=CHR$(191)&C
HR$(200)&CHR$(1)&"1"
450 DISPLAY AT(12,7)ERASE AL
L:"Working line"
460 LINPUT #1:M% :: IF M%=EN
D% THEN 610
470 LN=ASC(SEG$(M%,1,P-1))*256
+ASC(SEG$(M%,2,1)): IF O%="
Y" THEN 480 :: IF LN<FL OR L
N>TL THEN PRINT #2:M% :: GOT
O 460
480 IF LN>LN2 THEN 500
490 DISPLAY AT(12,1)ERASE AL
L BEEP:"ERROR! RESEQUENCE PR
OGRAM TO": "GREATER INCREMENT
S AND TRY": "AGAIN." :: CLOSE
#1 :: CLOSE #2 :: STOP
500 LN2=LN :: IF POS(7%,SEG$(
M%,3,1),1)<>0 THEN PRINT #2
:M% :: DISPLAY AT(12,19):LN
:: GOTO 460
510 P=POS(M%,S%,3):: T=POS(M
%,CHR$(161),3):: IF T=0 THEN
540
520 IF P=0 THEN PRINT #2:SEG
$(M%,1,LEN(M%)-1)&S%&C%&CHR$(
LEN(STR$(LN)))&STR$(LN)&K%&
E% :: DISPLAY AT(12,19):LN
:: GOTO 460
530 PRINT #2:SEG$(M%,1,P)&C%
&CHR$(LEN(STR$(LN)))&STR$(LN
)&K%&E% :: DISPLAY AT(12,19)
:LN :: LN=LN+1 :: GOSUB 740
:: M%=LN%(SEG$(M%,P+1,255)):
GOTO 470
540 IF P=0 THEN PRINT #2:SEG
$(M%,1,2)&C%&CHR$(LEN(STR$(L
N)))&STR$(LN)&K%&S%&SEG$(M%,
3,255):: DISPLAY AT(12,19):L
N :: GOTO 460

```

```

550 A%=SEG$(M%,1,P-1):: R=PD
S(A%,CHR$(132),3):: S=POS(A%
,CHR$(201),3)
560 IF R=0 THEN GOSUB 800 ::
GOTO 600
570 IF S=0 AND R<>0 THEN GOS
UB 750 :: GOTO 460
580 IF S<>0 THEN IF S-R<3 TH
EN GOSUB 800 :: GOTO 600
590 GOSUB 750 :: GOTO 460
600 LN=LN+1 :: LN2=LN :: GOS
UB 740 :: M%=LN%&SEG$(M%,P+
1,255):: P=POS(M%,S%,3):: GOT
O 540
610 LN=29999 :: GOSUB 740 ::
PRINT #2:LN%&CHR$(131)&CHR$(
64)&CHR$(80)&CHR$(43)&CHR$(
0)
620 LN=30000 :: GOSUB 740 ::
PRINT #2:LN%&CHR$(161)&CHR$(
200)&CHR$(1)&"A"&CHR$(183)&
"X"&K%&E% :: IF O%=1 THEN 67
0
630 LN=30001 :: GOSUB 740 ::
P%=LN%&CHR$(132)&"F"&CHR$(1
90)&CHR$(200)&CHR$(1)&"0"&C
HR$(176)&CHR$(159)&CHR$(253)&
CHR$(200)&CHR$(3)&"250"
640 P%=P%&CHR$(181)&CHR$(199
)&CHR$(LEN(PD%))&PD%&CHR$(13
0)&"F"&CHR$(190)&CHR$(200)&C
HR$(1)&"1"&S%&CHR$(156)&CHR$(
253)&CHR$(200)&CHR$(3)&"250
"&CHR$(181)&CHR$(214)
650 P%=P%&CHR$(183)&CHR$(200
)&CHR$(2)&"27"&K%&CHR$(184)&
CHR$(199)&CHR$(1)&"N"&CHR$(1
84)&CHR$(214)&CHR$(183)&CHR$(
200)&CHR$(1)&"6"&K%&E% :: P
RINT #2:P%
660 LN=30002 :: GOSUB 740 ::
PRINT #2:LN%&CHR$(156)&CHR$(
253)&CHR$(200)&CHR$(3)&"250
"&CHR$(181)&CHR$(180)&E%
670 IF O%=2 THEN 700
680 LN=30003 :: GOSUB 740 ::
PRINT #2:LN%&CHR$(162)&CHR$(
240)&CHR$(183)&CHR$(200)&C
HR$(2)&"24"&CHR$(179)&CHR$(20
0)&CHR$(1)&"1"&K%&CHR$(181)&
"X"&CHR$(180)&E%
690 IF KC=3 THEN 720
700 LN=30004 :: GOSUB 740 ::
P%=LN%&CHR$(157)&CHR$(200)&
CHR$(3)&"KEY"&CHR$(183)&CHR$(
200)&CHR$(1)&"0"&CHR$(179)&
"K"&CHR$(179)&"S"&K%
710 P%=P%&CHR$(130)&CHR$(132
)&"S"&K%&CHR$(176)&CHR$(201
)&CHR$(INT(LN/256))&CHR$(LN-

```

(continued on page 3)

T. I. Writer (Part 8)  
Stan Katzean

FORMATTING-this is option 2 on the main menu and this is where the computer does work to give shape and size to a document (format). The process is done using certain codes that are "imbedded" in the text and "dot commands". Let's discuss the "imbedded" codes first.

The imbedded commands are the ampersand(&), the caret(^) and the "at" symbol(@).

If one wants to underline a word or words in a document just type the document up normally and for each word you want underlined type the &symbol in front of it. For example &help will underline help when this document is run through the Formatter.

If you want a word in bold face (darker print) just type @ in front of the word. For example @help would be printed out darker when printed out through the Formatter. Lastly, if one types the caret (^) between words the formatter treats those two words as one. This is called the "required space" symbol. For example if we type &help^me^out, the entire phrase "help me out" would be underlined. The same procedure would work for bold face.

Now how is the formatter used? Very simple, compose your document as normal, set margins, indents, tabs etc. Now enter your ampersand and "ats" where-ever you want a word underlined or bold faced. Now save this document to disk as a file. (Remember this from the past.) Leave the Editor and go to the Formatter (if you have one disk drive you will have to do some disk switching.)

In the Formatter the first thing you will see will be the statement "ENTER INPUT FILENAME:" at this point have your file diskette in drive 1 and type DSK1."filename". Then it will say "ENTER PRINT DEVICENAME:" for my system I enter PIO.LF. (You will enter either PIO.LF or PIO.CR \_\_try one and see how the printer overstrikes and underlines, if it doesn't work try the other. Start with PIO.LF. I am assuming a parallel printer not a serial printer.) Then the screen says "USE MAILING LIST?N:" press enter. Then it says "WHAT PAGE(S) A". (More about this later.) Press enter. Then "NUMBER OF COPIES: 1" press enter. Then "PAUSE AT END OF PAGE? N", if you are using tractor fed paper press enter else press Y and then enter. At this point one sees "WORKING..PRESS CLEAR TO STOP" and your document will now be printed out on paper with the margins you set and everything you wanted to be boldfaced and underlined. When the formatte is finished you will be returned to the main menu screen.

If you remember at the very first part I said that the printer should be Epson compatible, this is so

because if your printer is not Epson compatible it might not recognize the codes sent by T. I. Writer for underlining and boldfacing. To wrap-up 1)enter your document in the Editor 2)make a disk copy and 3)then use the Formatter.

More next time.

## TI FORTH TUTORIAL NUMBER TWO

IN THE LAST LESSON:  
!!!!!!!!!!!!!!!!!!!!

You have determined which of the editors suits you and found a display color you like. They could be entered from the key board each time FORTH is booted. But there is a better method: Let the disk do it for you! To begin with we'll use the simple - and later on a more elegant - way.

(If you haven't made up an overlay yet, better do it now, else editing isn't going to be easy. Programming in FORTH is done by editing SCREENS and the various editing functions are made a lot easier if you can refer to the overlay.)

So boot your FORTH disk again and when the MENU shows up, enter either -EDITOR or -64SUPPORT. Now get out your manual and go to Appendix I (Contents of the Disk) and look at SCREEN 3. This is the one that gives you the first inkling that something is going on by displaying "BOOTING". So you get an idea of the way FORTH works, let's scan its content before going on :

Line 0: The parenthesis ( ) act like a REM in Basic, so we see that it is called the Welcome Screen. GOTOXY is like DISPLAY AT, note the coordinates 0 0 preceding it. Line 1: Forget the BASE->R for now, but let's do something with HEX. From your keyboard enter:

```
HEX B3C2 DECIMAL .
```

Don't forget the period, actually a FORTH WORD called DOT. (Look up each word in the GLOSSARY) What did you get ? -31806 is correct. In plain English line 1 states: Switch to BASE 16, put >10 (16) on the stack, and C! ( C-STORE, see page 17, Glossary) it at B3C2. This is how FORTH does the CALL LOAD for FUNCT-Quit Off. (You have seen that one before!)

(continued next page)

Line 2: DECIMAL returns us to Base 10, ignore the ( 84 LOAD ), 20 LOAD loads SCREEN 20 (look at scr # 20 and you'll see that it's the menu which appears at boot time. 16 SYSTEM is CALL CLEAR (more about System Calls later) and finally MENU displays the menu. Take a moment to digest this, as it gives some idea as to how FORTH works. The command 20 LOAD booted scr # 20 at which time a new FORTH WORD was compiled (see scr 20, line 1): MENU is now part of the DICTIONARY. Anytime MENU is invoked, FORTH looks it up and executes it. Try it, enter MENU. You get the menu and 'ok'. If you enter something FORTH can't find you'll see a '?', sometimes followed by an error message (see Appendix H).

Most mistakes made by beginners are simple ones, such as missing spaces, colons or semicolons or a LOAD OPTION not booted.

OK, back to the Welcome Screen. But now let's put it on display. Enter 3 EDIT and watch it come up. Skip to line 4 and note that here we have the menu words defined, i.e. : -EDITOR 34 LOAD ; etc. The first word after a ':' is the new word being added to the dictionary. Any words that follow will be executed, provided FORTH can find them in the dictionary. The definition ends at ';'. Now move the cursor down to line 12 and type -EDITOR (or -64 SUPPORT) (enter). Are you surprised that nothing happened (except the cursor moved to the start of the next line)? That's because you are in the EDIT mode. If you are sticking with the normal Editor type in the number which you selected with the SEE experiment as you display color followed by 7 VNTR. If you chose the 64-column Editor don't bother, type : COLD TEXT COLD ; instead.

Hit the ESCAPE key (F-9) to get out of EDIT. Your additions to scr 3 are NOT actually on the SCREEN but in a buffer and you must enter FLUSH before going on.

Remember that every time you EDIT a SCREEN you must FLUSH, otherwise all your efforts will be for naught.

So let's check if your edit was successful. Enter COLD. This word is like NEW except you don't have to do anything else, FORTH will re-boot. (It'll take longer now because you are booting the editor also.)

Now let's recap:  
 \*\*\*\*\*

You have 'edited' SCREEN 3 so it boots your editor and sets up the screen color for you. This was done while in the EDIT mode. You have also worked in the 'interactive' mode when you defined the word SEE to determine your color choice. In this mode you can try out your definitions before you use them in a program. You'll find this to be tremendously helpful because unlike BASIC there is no need to go to RUN and see what happens and then finding the line which needs to be changed.

Having worked my way into TI-FORTH the hard way, I will leave you with a few suggestions which I feel will be helpful:

Look up each new word in Appendix D of the manual. See how it is defined. Mark the chapters and appendices in your TI-FORTH manual for easier access to them. You'll be using it frequently because - even though it may not seem so at first - it DOES contain a lot of information. to them. You'll be using it frequently because - even though it may not seem so at first - it DOES contain a lot of information.

Get a FORTH book, preferably Leo Brodie's STARTING FORTH. It is sold in many bookstores/software houses. The manual (Appendix C) explains the differences between fig-FORTH, which Brodie uses, and TI's implementation of it.

Though it may read like Greek, scan through the manual. As we go along you might just remember having seen something that rings a bell. (Finding it again may be something else!)

If you have any problems, feel free to call me at (619) 277-4437. I am usually at home evenings after 5 PST.

LUTZ WINKLER

END FORTH TUTORIAL TWO

\*\*\*WELCOME\*\*\*WELCOME\*\*\*WELCOME\*\*\*

The PUG would like to extend a warm welcome to our newest member...St. Norbert's School. We would also like to convey our continued welcome to Don Heiber, Jeff Scott, Norman Rokke and Mike Sealy who have recently renewed their memberships.

GETTING THE MOST FROM YOUR CASSETTE SYSTEM  
 BY NICKEY SCHMITT  
 NUMBER 17  
 UNDERSTANDING - CREATING - AND USING - CASSETTE FILES  
 PART VI

TO "OPEN" UP A CASSETTE FILE... FOLLOW THESE STEPS...

```

    01      02      03      04      05      06
    LINE   NEED SPACE  OPEN  NEED SPACE  FILE SIGN  FILE
    NUMBER  NEED SPACE  OPEN  NEED SPACE  FILE SIGN  NUMBER
    -----  -----  -----  -----  -----  -----
    ANY NUMBER  1 TO 255
    10      OPEN      1
    
```

```

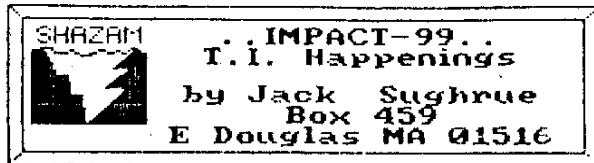
    13      14      15      16
    FILE   FILE TYPE FORMAT
    NEED COMMA ORGANIZATION NEED COMMA
    SEQUENTIAL INTERNAL FORMAT = PRINTABLE ASCII =
    SEQUENTIAL INTERNAL FORMAT = MACHINE LANGUAGE =
    SEQUENTIAL INTERNAL FORMAT = PREFERRED OPTION =
    
```

```

    07      08      09      10      11      12
    DEVICE  OPEN MODE
    NEED COLON  NEED QUOTE  FILE NAME  NEED QUOTE  NEED COMMA  -----
    CS1 OR CS2  INPUT OR
    CS1  OUTPUT
    CS1  = CHOICE =
    
```

```

    17      18      19      20  DEFAULTS
    RECORD TYPE  SEQUENTIAL
    NEED COMMA  -----  NEED COMMA  FILE LIFE
    FIXED LENGTH  -----  DISPLAY
    1 TO 192 POSITIONS  PERMANENT
    FIXED 64
    FIXED  PERMANENT
    FIXED  PERMANENT
    
```



### GOOD OLD DAYS ARE COMING BACK!

Remember those good old days of 1982-84 when there were loads of books and magazines for us TIers? When we could buy text materials for our computer faster than we could read and use them?

Methinks these days may be returning. At least a little.

At recent fairs and meetings I've attended there has been lots of talk about the disappearing textware in the TI World Community. No more books. No more magazines. No more...

Actually, there is more good, intelligent, useful TI stuff being written for textware today than there was four or five years ago. It's just that most of it is being written by users in user groups, not by some writer in an ivory tower somewhere. Most of these new writings are free (in newsletters with membership or in exchanges with other groups) and readily available.

Someday, I'd love to publish a list of my favorite dozen newsletters worldwide, but then the IMPACT column may be reduced to only 12 publications.

So much for that idea.

Joining a user group, even by mail if there aren't any nearby, may be the most sensible investment a 99er could make.

However, there are still lots of other sources for textware in our fellowship.

**COMPUTER SHOPPER** (\$21 for 12 monthly issues) P.O. Box 1419, Titusville, FL 32781-9988. This 10 X 14 500-plus page giant is probably the best single source for inexpensive disks, drives, cables, monitors, printers, what-have-you. It also has a listing of user groups (Check to see if yours is there.) and a TI classified section. But the reason most of us subscribe is the TI FORUM written by Ron Albright and John Zittrain. These two guys have a folksy approach to the realm of TI computing. Their monthly articles are full of wit and information and lots of heady reviews and predictions.

**MICROpendium** (\$20 for 12 monthly issues) P.O. Box 1343, Round Rock, TX 78680. This is the best magazine source for all TI owners, from super techie all the way down the ladder to people like myself. The 40-page newsprint periodical is totally devoted to the TI world and is as up-to-date as one can get. If you can only

afford one TI magazine, this is probably the one. (John Zittrain, Ron Albright, Barry Traver, Chris Bobbitt, and Bruce Forbes - are probably going to kill me for saying that.)

**ASGARD NEWS** (\$6 for 4 quarterly issues) P.O. Box 10306, Rockville, MD 20850. Though this magazine is fairly new, the editor - Chris Bobbitt - has been programming and writing steadily for the TI community since his teenage years. So it's a natural step up to see a full-fledged magazine come out. Most of the first issue was devoted to previews of coming attractions and reviews of many of Asgard's products. Each issue, though, has an extended article (the 9640 vs the 99/8, for example) and editorials and regular columns and corners. Lots of small, helpful hints and comments are given on a variety of TI subjects.

**Genial TRAVELER** (\$36 for a one-year, six-disk subscription; \$65 for a two-year subscription. These subscriptions also have bonuses.) 835 Green Valley Drive, Philadelphia, PA 19128. In a way Barry Traver's diskazines are not strictly a hardcopy magazine, but the DV/80 files dumped will give you the equivalent of a novel. To be a 99er with a disk drive and not have this service is to live a deprived life. These are packed! Really packed disks of an incredible variety of things for the TI: music, utilities, games, wordprocessing, everything else. Far less than a penny a sector, these disks may be ordered as Volume One (the set already complete), Volume Two (still some to come), or both. I would recommend Volume One first.

All of the above you may already own or at least know about. But there is another text/disk setup out there that is really worth discovering. It's been around since September of '87, and it is another large value for we 99ers, though it just hasn't gotten the attention many other TI efforts have gotten.

Tld Bits is a bimonthly magazine for only \$8 (6 issues) for hardcopy or \$12 (6 issues) for disk (SSSD floppy). The disk contains lots of additional PD and Fairware stuff to extend to two sides. The magazine contains photos and graphics.

Mail to Bruce Forbes, editor; Route 2, Box 412; Sumerduck, VA 22742.

It may be hard to make a decision about which version to get - disk or text. Although the disk contains the exact text of the hardcopy (and a lot of other surprise goodies besides), I personally am partial to the hardcopy for a number of reasons.

Tld Bits pilot issue contained some screen photos, graphics of an envelope catalogue, and a screen graphic to go along with a program printed out.

The next issues, however, contained some of the best photographs I have ever seen of the internal structure of our computer. The text talks about chip replacements and



gives some very precise, easy-to-follow photographs and enlargements that make the process very logical, very clear, and - even to a non-techie like myself - very un frighteningly practical.

It's one thing to see drawings (which are also in the magazine), but it's quite another to have step-by-step photographs of the entire process.

These magazines are jam-packed with all kinds of stuff that you don't find in MICROpendium, ASGARD NEWS, or - because of the nature of the zine - Genial TRAVeLER.

Bruce supplies the reader with all kinds of inside information on a large variety of things for us 99ers. Lots of prices of things. Lots of addresses. Lots of reviews. Lots of programs.

It's a one-man operation at this point, and each issue gets better and better.

Bruce has promised to continue this magazine through at least one year's subscription. And hardcopies of all past issues will be available through 1988 with each subscription. The disk versions will continue to be available, I assume, for a long time to come. Newsletter editors may be interested in getting this version for an excellent source of some interesting material.

Bruce says of his excellent efforts, "A lot of thought went into the pricing of Tid Bits. We were keeping in mind that the TI community has been shafted too many times. Therefore, we set a break-even factor projected to December 1988. If we should pick up a sponsor or advertiser throughout the year, those funds would be used to lure a TI Brain to produce unique articles for us." [I'm available, Bruce.]

"We are committed to 1988 and are cautiously optimistically looking to 1989. If the world doesn't end or the TI community completely collapse we project some kind of survival into 1989 and beyond."

Hooray!

Writers and programmers and techies and non-techies, take note! Here is a good source for you to get those articles and designs and comic strips published.

Readers, here is another great TI source that needs

all our support. For only \$8 we could be supporting our own futures with our fabulous machines.

Good luck, Bruce!

#### HELPFUL HINT OF THE MONTH

This has to do with TI WRITER (or any version: FUNNELWEB, BA WRITER, whatever).

Did you know you can type anything you want after a carriage return ON THE SAME LINE and it won't print out. But it'll SAVE. This is great for text notes for screen reading. I've used this a lot, particularly when I'm writing articles or poems. Very handy.

Also handy is the space use in LF and SF.

When you LF and there is already a DSK2.HEMENWAY up there on auto and you want to load DSK2.KONG, all you have to do is type the KONG and press the Spacebar and Enter, even though it'll say DSK2.KONG MAY on the screen. Actually, you can even SAVE a file with a long (up to 80-col) note after a filename and space. This will disk SAVE and screen read but not print out. Lots of handy reasons for this on working disks.

Another handy-dandy is letter saving. If you write as many letters as I do (between 30 and 40 a week), it's a good idea to let your FUNNELWEB do the sorting and hard work for you. Just name the letter by date and name in the following way. If I write to Jim Peterson on May 17 I would SAVE the file as DSK2.517JIMPETE. Always month first (5) followed by day (17) and the name as far as it'll go. So if I wrote to Jim on November 27 it would be 1127JIMPET, but if I wrote on April Fool's Day it would be 41JIMPETER. This is also handy if you write a lot of letters on the same day, as TI WRITER will sort them for cataloguing first by number then by letter. So they will be numerically AND alphabetically sorted in the catalog.

Have any handy-dandys of your own (or ones you've come across)? Send them along. I'll be happy to IMPACT them for you, with full credit, of course.

\*\*\*\*\*

## WISH BOOK

Have you ever wished you had a certain cartridge, another disk drive, an RS32 card or some other piece of equipment for your system? Something new has been added to the Club. On the table, you will find a Wish Book. If there is something you would like to have, simply put your name and the item you would like in the book on the appropriate page. There will also be a page to list any item you would like to sell or swap. Simply check it out each month and your dreams may come true. Frank Shoemaker will be in charge of the Wish Book. We think this will give another service to our members.

TIPS FOR BEGINNERS

-BY FRANK N. ZIC

Here we go together No. 15. I have often said that if I had a choice to keep only two disks from all the ones I own, one would have to be Superdisk for all my serious work and experimenting. The other would be a group of games which would happen to include Midnight Mason. Now aren't you just a little curious as to what makes the Superdisk so important? Let me interject right here that I also think that a fully filled-in FNEB V4.11 disk might also be your primary selection. At any rate the important point is that if you have a disk drive set-up and do not have either of these two disks, then you should go out of your way to obtain a copy of one or the other. Just think of having a Cataloger, Modem Emulator, Disk Manager, Disk+Aid, Fast Copier, TI-Writer, Loaders and a whole host of useful Utilities, all on the same disk.

Yes, the programs break up very nicely to fit on both sides of a single sided disk. Boy, what power you have at your finger tips. Oh, yes the game disk can have on it whatever games you like best. By the way my personal high score for Midnight Mason is currently 24,670. I'm really interested in knowing what some of the other high scores might be. Let me know. Now let's move on to some general information in a variety of areas:

\*\*\* Files that are downloaded in XMODEM, DIS/FIX 128 form will probably need to be Unarced to be useable. If they are in DIS/INT 128 form, they will first have to be Uncompressed and then Unarced. Sometimes the term 'Arced is used incorrectly or too loosely. I've overheard people say "Here is a copy of ??? that I downloaded from the BBS last night, you will have to Arc it." In all likelihood, they should have said that you will have to Unarc it. The final conversion form should show up as DIS/Var 80, which of course is readable with TI-Writer or in 40 column by using the read function in DM/1000. (Editors note: Archiver V3 is now out that makes the Arc/Compress or the Unarc/Decapress into a one step procedure.)

\*\*\* Don't forget about the quick and easy-to-use calculator that is built into our TI units. From Basic or XB, simply put in a line such as: PRINT 57\*25 (Enter) or PRINT 38-16 (Enter) or PRINT 85\*2 (Enter) or PRINT 95/5 (Enter). Try it and you'll see how the answers come right up. Won't the kids be glad you reminded them of this little maneuver. Good for long columns too.

\*\*\* Another nice math operation is when you want to obtain the Square Root of a number. Similarly as above enter PRINT SQR (n). Fill in any number you want the Square Root of in the (n) position and the answer is

quickly displayed out to 10 total digits. You must include the ( ) when setting up the problem. Neat.

\*\*\* So you want to list out just certain lines from your total program listing. You can easily do this by entering, i. e., LIST "PIO":140-260. This little step will allow you to print out a copy of lines 140 to 260. Alter the "PIO" for your specific printer.

May the good 4's be with you.

MULTIPLAN

By Audrey Bucher

Part 10

This month's column will be a short one with a few hints and tips.

If you have a MP data disk with more than eighteen files on it, you may have wondered how to catalog the disk as the screen will only show the first eighteen files when you use the arrow for a directory. From the New Jug North comes the following instructions. When the eighteen files are displayed on the screen, place the cell pointer on the last filename and press REDD (function 8). The screen will redraw and display TRANSFER LOAD filename: where filename is the last filename of the previous directory displayed. The message line will now display "Enter a filename (arrow for directory)"

Press Function down arrow to display additional filenames beginning with the last filename on the previous display. Attempting to access (T)ransfer, (L)oad without any files on the disk or without a disk in the drive will cause the computer to lock up. To cancel the show directory command, press CTRL+ or CTRL C.

Multiplan files are not necessary to test this function of the show directory command. Use any disk containing at least twenty or more files.

Another tip comes from Roanoke Valley. Once you start scrolling you can release the Function or Control key and just keep the arrow depressed. (The function and arrow keys scroll one cell at a time and the Control and arrow keys cause the cell pointer to scroll four cells at a time.) Scrolling did not work on the original MP disk. It is necessary to have the updates for this.

Next month we'll talk about Indexing. I have just learned to use this and have found it useful in keeping track of the golf scores that I wrote about last month. We'll look at some of the other uses for this.

If anyone has any other uses for MP, please let us know. Always looking for new ideas.

## THE KIDDIE CORNER

by Sue Harper

For kids of all ages - a series of articles on how to get started making your own computer programs.

Last month we found out how to make the computer PRINT whatever we wanted to. This month we will learn a few more commands, and also show how to make the computer do all that pesky math homework the teachers keep giving you!

Sometimes when you are typing, and like all of us make some mistakes, soon the screen is full of junk! If you want a clear screen, just type CALL CLEAR and press ENTER. Whatever was on the screen is now gone, and you can start again. When you are done for the day before turning the computer off, you should be polite and tell the computer BYE. As a matter of fact, if you type the word BYE and a space, you can put anything after that, and the computer will still go back to the title screen.

The reason why is that BYE is a reserved word, very special to the computer. If the computer sees the word BYE, it does not look any farther, and just 'goes bye-bye'. Try typing in BYE BYE MR. COMPUTER, or maybe give your computer a name and type in BYE BYE RALPH. SEE YOU LATER. Be sure to press ENTER.

Now, on to the math homework! To make the computer print a number is very easy. There are a few ways to do that. The first way is to do it the same way we told the computer to print a word:

```
PRINT "25"
```

The computer will print the number 25. But, with numbers you do not need the quotation marks! Now try this:

```
PRINT 25
```

The printout is the same! Now, let's try something tricky. This will take two commands. Make sure to press ENTER after each one:

```
LET A=25
PRINT A
```

And the computer printed a 25, because we told the computer A is 25!

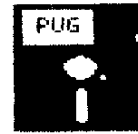
Well, to get the computer to do your homework, you have to know what symbols the computer uses. To add, the computer uses '+', to subtract use '-', to multiply use

'\*', and to divide use '/'. For the computer to do you math, just type in the command:

```
PRINT 7+2
PRINT 42-9
PRINT 150*2
PRINT 50/5
```

Each time you press ENTER, the computer will give you the answer, and wait for your next question.

Next month we will learn what makes a program special, and make up a few programs. See you then!!!!



## FROM THE LIBRARIAN. . .

It was good to see all those smiling faces at the August meeting, and I hope even more of you turn out for the September meeting!

New this month. . . Well, there's not too much, but what we have is great! We have the new version of Funnelweb. It is version 4.11, and was given to me in a three disk set. I will try to put it on two disks, but that might not be possible! If you bring in your old version of Funnelweb, whatever number it is, we will trade you disk for disk. In other words, if Funnelweb 4.11 remains a three disk set, returning your two disk set plus \$2.00 will get you the new Funnelweb. About ten people have already asked me to make and hold a copy for them, and I will bring along twenty extra for the rest of you!

Also we received the new version of Barry Boone's archiver, and it will be in the library, and the program Woodstock which was demoed at the August meeting. It is a very nice Christmas graphics program starring Woodstock from the Peanuts comic strip.

Also new and having to do with the library is the new catalogue, done with Marty Kroll's Catlib companion. As of the writing of this article, the professional section is complete, and will be available to all. If the professors at Pitt aren't too unreasonable, maybe utilities and songs will be ready, too. All you folks who have sections out, please get your sections finished and return them to me. Our public awaits!!!!

See you there!!!!

SEPTEMBER 1988						
S	M	T	W	T	F	S
			1	2	3	
4	5	6	7	8	9	10
11	12	13	14	15	16	17
(18)	19	20	21	22	23	24
25	26	27	28	29	30	
PUG MEETING						

OCTOBER 1988						
S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
(16)	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

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#### SCHEDULE OF EVENTS

- 3-4:30 TI Artist Class with Gary.....Re. 401  
 4:30-6 Hardware Class with John Wilforth.....Re. 475  
 4:30-5 Multiplan, PRBase Q&A with Audrey.....Re. 401  
 6:00-? General Meeting

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