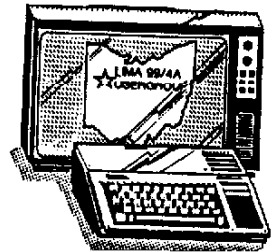


BITS, BYTES & PIXELS

LIMA AREA 99/4A USER GROUP
VOLUME II NO12
DECEMBER 1986 MERRY CHRISTMAS!



COMMENTARY

Maybe you still believe in Santa Claus if you do let us not be the first one to destroy your fantasy. If, however, you are more cynical we have an idea for you. Since most of our spouses are not initiated into the wonders of hacking maybe you will have to guide him or her into buying a Christmas gift for you. We suggest a modem. With this device (hardware to us) a whole new world is opened for only the cost of a long distance telephone call. A number of regional User Groups have a 24 hour bulletin board. From these you can download programs inquire about new ideas, solve problems and sell your excess or surplus equipment. We were reading a magazine called "Online Access" and found that there an increasing number of online services (for a fee, of course) that open a new field of entertainment, learning and information to the hacker.

Try it you'll like it.

READER RESPONSE

MESSAGE FROM GRANNY-WRITER

I always hesitate to point out someone else's mistakes to them since I usually have enough of my own to explain away, but I just couldn't wait November's brain teaser go by without a small comment - especially the answer at the bottom of page 1 of BITS, BYTES & PIXELS ... I had no problem with the question, but I had to stand on my head to read the answer!

Now, if all the mathematics I have learned in the last umpteen years is correct I can come up with only 1/2 inch for an answer, not counting a thousandth of a centimeter or so for the front and back cover. However, even that answer is incorrect-scientifically and mathematically. To make a short story as long as possible let me tell you of my experience in trying to solve this dilemma (or prove the answer given)

I went to a great deal of trouble and very little expense to acquire 6 bookworms. These are not easy to find, by the way. I did not wish to be lax in my proof of this deep problem by using only 1 bookworm and thereby give some genius in our TI Club cause to condemn my method as not truly scientific. To start the experiment I carefully put each book worm on the front of Volume I each time and then replaced Volumes I, II, III neatly upon the shelf and left the little grubbers to gleefully bore his way through my volumes. I instructed the little rascals about which direction they were to masterfully masticate through my books and then gave them 24 hours to do their work. (The instructions part was really the hardest part of the experiment).

Sad to say that out of six tries not one of those little wigglers had taken one bite out of my books, for you see, each of the six times I went to the shelf to see how my clinical experiment was progressing, I found only 1 very squashed, dead, zilched glob of ex bookworm on the front of Volume I and the back of Volume II. As the answer on page 1 of BITS, BYTES & PIXELS so aptly put is, (Place three books on a shelf in sequence and see for your self!!!)

PS Don't forget the worm!

EDITOR'S COMMENT: Whew!

BRAINTEASER



Get the message? ...



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ANSWER TO BRAIN TEASER

The ideogram translates into "I'm overworked and under paid"

Miscellany

A magician had a pet parrot. whenever the magician was performing, the parrot would sit on his shoulder and squawk, "The rabbit is hidden in the top of his hat," or "The ace is up his sleeve."

On an ocean cruise the magician and the parrot and the magician were shipwrecked when the ship sank after hitting an ice berg. After floating in the icy water still on the magician's shoulder the parrot said, "I give up; what the hell did you do with the ship?"

EDITOR'S COMMENT: This is all we could find; we need help!

PRINT-O'S

By Dorothy Winget

Here's a short routine I developed which will print decimal numbers in columns to a printer with the decimal points properly lined up. You can use your choice of printer tabs to print these numbers.

```

80 REM BY DOROTHY WINGET
90 REM THE NAME OF THIS PROGRAM IS "PRINT-O'S"
100 CALL CLEAR
110 REM THIS SHORT PROGRAM WILL PRINT O'S TO PRINTER & LINE UP DECIMAL POINTS
120 OPEN #1:"PIO"
130 INPUT "WHAT NO. DO YOU WANT PRINTED? ":I
140 T$=STR$(I)
150 T$="000"&T$
160 L=LEN(T$)
170 DEF PRA=(22-POS(STR$(I)&".",".",1)-(I<0))
180 IF SEG$(T$,L-1,1)=". " THEN 230
190 IF SEG$(T$,L-2,1)<>". " THEN 250
200 PRINT "NUMBER= ";SEG$(T$,4,L)
210 PRINT #1:TAB(PRA);SEG$(T$,4,L)
220 GOTO 130
230 T$=T$&"0"
240 GOTO 200
250 T$=T$&".00"
260 GOTO 200
270 REM LINE 170 DEFINES DECIMAL TABS
280 REM LINE 230 PRINTS ONE "0" TO END OF NUMBER
290 REM LINE 250 PRINTS ".00" AFTER NUMBER

```

CHARLIE SAYS:

A REVIEW OF "GK UTILITY I"

Throughout the various sources of TI information are numerous suggestions on how to modify and improve EXTENDED BASIC or the EDITOR ASSEMBLER module if you have a GRAM KRACKER. Some of this information is in the GK Operators Manual, some is published in newsletters, some suggestions are to be found on various BBS's and other suggestions have been published in THE SMART PROGRAMMER. Now Millers Graphics (who have recently changed their name to simply "MG") have gathered together the best of these modifications and improvements, added some more, and put them all together in a piece of software for the GRAM KRACKER called "GK UTILITY I".

An advertisement describing GK UTILITY I's main features is found elsewhere in this newsletter. The disk can be purchased for \$10 including shipping from MG, 1475 W. Cypress Ave., San Dimas CA 91773, U.S.A. EARTH (This is the address exactly as given by MG.) System requirements include a TI 99/4A (not a 99/4) console, 32K memory expansion, disk system, version 110 of EXTENDED BASIC, and an 80K GRAM KRACKER. A printer and the EDITOR/ASSEMBLER module are highly recommended.

The package allows you to either add features to EXTENDED BASIC by itself, or to a combination of EXTENDED BASIC and EDITOR/ASSEMBLER which can then be saved together as a single module loading into grams 3-7. If you choose the combination then the EDITA1, ASSM1, and ASSM2 files are loaded by the software package into grams 1 and 2 for instant access when typing in assembly language program listings. In either case, a new character set with true descenders is loaded into gram 0.

Since I am not an assembly programmer, and I already have the equivalent of the E/A module installed in my ramdisk in the form of FUNLWRITER, I chose to use GK UTILITY I to modify only EXTENDED BASIC. This allows me to store some short TI BASIC programs in gram 7 (where the E/A module would be in the combined version) and to add these programs to my power up menu in addition to the modified EXTENDED BASIC. I did this with the MSAVE program that comes with the GRAM KRACKER. The ability to use MSAVE with modified EXTENDED BASIC is a major reason why one would choose not to use the XB-E/A combination available with GK UTILITY I. This ability should be mentioned in the GK UTILITY I documentation. It isn't.

My startup menu is as follows:

PRESS

1. FOR TI BASIC
2. FOR GK-XB
3. FOR DISK MANAGER
4. FOR PRINTER CONDENSED
5. FOR PRINTER N.L.Q.

Item 3 loads DM1000 from my horizon ramdisk via a 1 line BASIC program that reads 100 CALL DM. Items 4 and 5 set up my STAR SG10 printer for either condensed or near letter quality print and then return the computer to the startup menu.

The software package loads an excellent lower case character set with true descenders into the computer's operating system (gram 0). This character set is available from TI BASIC, modified EXTENDED BASIC (hereafter called GK-XB) and from any module that uses the computer's character set as long as the GRAM KRACKER is switched to gram 0.

This new character set is easier to read than either of the ones TI released with the Fix 1 public domain version of TI-WRITER. It is comparable in readability to the CHARA2 character set that is part of the FUNLWRITER V3.3 package.

What follows are my personal observations after using GK-XB. I have not had any experience with the E/A modifications. All existing extended basic programs run correctly with the new modifications in place. There is no compatibility problem with existing software.

GK-XB is dark blue with white letters when in command mode, and the usual light blue with black letters when running a program. This cosmetic change is very useful in that you can easily tell whether you are in command or program modes.

The QUIT (FCTN =) key is disabled upon entering GK-XB and remains so unless you turn it on with CALL QUITON. I can see no reason for doing this. BYE works just as well and is safer. Never again will you accidentally erase a program you are typing in by pressing FCTN = instead of SHIFT -.

LISTing to a printer can now be done with any desired line length. Twenty eight column listings simulate exactly what you see on the screen. This is particularly useful for error checking when typing in other listings, and when printing listings for others to type in. The 28 column program listing elsewhere in this newsletter was printed on my SG10 printer in this manner. You can also specify 132 columns to take full advantage of condensed print. The GK UTILITY I documentation makes the list syntax look very complicated (LIST "device name": line length:start line number-end line number). What is not made clear is that the complete syntax often isn't needed. NEXT PAGE PLEASE

LIST lists to the screen as usual.
 LIST "PIO" lists the entire program to a parallel printer with the default line length.
 LIST "PIO":28: (you need both colons) lists the entire program to a parallel printer in 28 columns.
 LIST "PIO"::150-200 lists lines 150-200 to a parallel printer with the default line length.
 LIST "PIO":132:150-200 lists lines 150-200 to a parallel printer in 132 columns.

RESequence can now be used to resequence only part of a program. This can be very useful to those who write in BASIC. The documentation shows several examples of the new syntax (RES initial line, increment, starting line number-ending line number), but again does not make clear that all this is not always needed. RES will work exactly as in ordinary XB if desired.

RES resequences the entire prog. starting line numbers with 100 and using an interval of 10.
 RES 50 resequences the entire prog. starting line numbers with 50 and using an interval of 10.
 RES 50,5 resequences the entire prog. with starting line number as 50 and with an interval of 5.

TRACE can now be made to output to any output device such as a printer or disk drive. This allows you to TRACE a program without disrupting the screen display, a theoretical advantage.

Unfortunately, the way this feature works several program lines are executed before their TRACE numbers are printed. Thus when a TRACE is sent to a printer you can't see on the screen the exact effect each program line causes. I consider this a major disadvantage. I don't think I will find sending TRACE's to my printer very useful because of this problem.

CURSOR MOVEMENT when editing program lines has been greatly improved. You can now move the cursor UP or DOWN within a program line by pressing FCTN-SHIFT and the E or X keys. Similarly, you can instantly move the cursor to the start of a program line or to the space after the end of a program line by pressing FCTN-SHIFT and the S or D keys. These movements also work when responding to an INPUT or ACCEPT AI statement in a running program. The enhanced cursor movements are very useful additions to extended basic.

You can now DELETE a group of program lines from a program all at once rather than one at a time. This feature is not only useful for programming, it is also handy in attempting to get very long programs transferred between tapes and disks.

CALL PEEKG, CALL POKEG, CALL PEEKV, and CALL POKEV work exactly as the regular CALL PEEK and CALL LOAD except that they peek and poke to gram/grom or to VDP memory. There may be some uses for these in a running program (I personally don't know of any such uses.). Outside of a program these functions are most easily done with the excellent memory editor that comes built into the GRAM KRACKER.

SAVAGE ISLAND 1 WORD LIST

Here is a word list for the Scott Adams adventure SAVAGE ISLAND 1. The computer responds to only the first four letters. Next time I will provide a list for SAVAGE ISLAND 2, include the all important password needed to start the game.

First Word (usually a verb)	Second Word (usually a noun)
ASK	ANIMAL
AUTO	ANY
BREAK	ARAH!
BUILD	ASH
CATCH	BASIn
CLIMb	RAT
CRAWL	BOTTle
CUT	BREAK
DESCend	BUTTON
DIG	CAVE
DRINK	CAVEman
DROP	CLIFF
EAT	CREvice
EMPTY	DOWN
ENTER	EAST
EXAMine	EDGE
FEEL	FEET
FILL	FREE
FIX	HAND
GET	HEAD
GIVE	HOLE
GO	HURRICane
GRAB	INVENTory
GELP	JUNGle
INVENTory	KNIFe
JUMP	LAKE
KILL	LEDGE
LEAVE	NEANderthal
LOOK	NORTH
MAKE	OCEAN
MOVE	ONE
OPEN	OUT
PADDle	PALM
PET	PIRAtE
PICK	RAFT
POLD?	RUM
PRESS	SALT
PULL	SAND
PUSH	SKIP
PUT	SOUTH
QUIT	STALactite
READ	STORE
READY	TIDE

RELE?	TIDEpool
REPAir	TREE
RUN	TUNNel
SAIL	UP
SAVE	VINE
SAY	VOLCano
SCORE	WATCH
SCRE?	WEST
SEE	WIRE
SLEEp	
SMASH	
SPILL	
SWIM	
TAKE	
TASTE	
TELL	
TOUCH	
TREAT	
TURN	
USE	
WAIT	
WALK	
WITH	
YELL	
YES	
YOH0	

FROM THE GRAPE VINE

The report in a previous issue of this newsletter about free TI-Writer manuals is no longer true. A recent phone call to 800-TI-CARES reveals that TI is now charging \$10 + \$3 postage for the official manual. According to the TI-CARES operator "There is another TI-WRITER like program available for free which has caused a great demand for the TI-WRITER manual." In our opinion, \$10 is too much. Users of FUNLWRITER or BA-WRITER (the "other" programs) can do just as well using some of the free TI-Writer documentation available on disk from user group libraries.

The following is quoted from a circular received Nov. 20 from Miller Graphics.

"Awhile back we were contacted by a large US company to design a piece of interface hardware and software for the 99/4A to allow it to use both IBM hardware and IBM software. This unit could be thought of as an IBM Expansion System since it will not only allow you to use IBM software but you can also add IBM cards to the system! That's right, now you will be able to run things like Lotus 123, dBase, Microsoft Flight Simulator, Quick Basic, MS-Basic and the Basic Compilers. That is about all we can say at this time. In January 87' this US company will make their announcement as to price and availability."

AT THE LOCAL STORES

ODD LOTS stores (also known as BIG LOTS 'SMALL LOTS) in Lima, Van Wert, and possibly other cities, have GE PROGRAM RECORDERS available for \$20. These are internally identical to the original TI PROGRAM RECORDER, although there are some cosmetic differences on the outside. These GE PROGRAM RECORDERS come with an AC power cord, a tape counter, and the ability to be used as a regular tape recorder. These units are sold with a FULL one year GE warranty as well as a 30 day money back guarantee from ODD LOTS. Cassette interface cables are NOT included, but there is a form inside the box which allows you to order a single cassette cable direct from GE so you can use your program recorder with your TI99/4A. I paid \$40 for my TI PROGRAM RECORDER in 1983. This looks like a good deal.



Editor's Note

This is not our best issue. We goofed in numbering pages and if you've ever tried to remove paper glue you know our problem! The same thing happened to page 1's borders. We'll try harder next time!!!

```

DLOR(SET,16,1):: NEXT SET ::
FOR SET=5 TO 8 :: CALL COLO
R(SET,5,16):: NEXT SET :: CA
LL CHAR(64,"#")
150 FOR SET=9 TO 12 :: CALL
COLOR(SET,16,1):: NEXT SET
160 DISPLAY AT(1,10):"TIGERC
UB": " MULTIMEMORY@CALCULAT
OR": "MEMORY #1": "MEMORY
#2": "MEMORY #3": "MEMORY
#4": "MEMORY #5"
170 M$(1)="123456789,+-%/X=
CXH" :: M$(2)="0123456789.A5
MDPEXCM" :: DISPLAY AT(20,1)
:"use ?":(1) symbols":(2)
alpha characters"
180 CALL KEY(0,K,S):: IF S=0
OR K<49 OR K>50 THEN 180 ::
A$=M$(K-40)
190 DISPLAY AT(20,1):S$(12);
"add";TAB(16);S$(16);"percen
t" :: DISPLAY AT(21,1):S$(13)
;"subtract";TAB(16);S$(17);
"equals"
200 DISPLAY AT(22,1):S$(14);
"multiply";TAB(16);S$(18);"c
ancel" :: DISPLAY AT(23,1):S
$(15);"divide by";TAB(16);S$(
19);"clear all"
210 DISPLAY AT(24,1):"M1 to
M5 = memories #1 to #5"
220 R=15 :: C=1 :: N,N1,N2,N
1F,N2F,M1F,M,NF,DF,FF,VF,EF,
FL,ZF=0 :: N$="" :: DISPLAY
AT(18,1):""
230 CALL KEY(3,K,S):: IF S<1
THEN 230 :: CALL SOUND(50,5
00,5):: DISPLAY AT(R,C):CHR$(
K):: C=C+1
240 ON POS(A$,CHR$(K),1)+1 6
OTO 260,270,270,270,270,270,
270,270,270,270,270,280,290,
250,290,290,290,340,410,420,
430
250 IF VF=1 OR MF=1 THEN 290
:: ZF=1 :: N$="-" :: GOTO 2
30
260 DISPLAY AT(R,C-1):"?" ::
C=C-1 :: GOTO 230
270 IF MF=1 THEN 260 :: FL=0
:: VF=1 :: IF DF=0 AND ZF=0
THEN N=N+10+K-40 :: GOTO 23
0 ELSE N$=N$&CHR$(K):: GOTO
230
280 IF DF=1 THEN 260 :: DF=1
:: MF,FL=0 :: IF ZF=1 THEN
N$=N$&". " :: GOTO 230 ELSE N
$=STR$(N)&". " :: GOTO 230
290 IF C=2 OR FL=1 THEN 260
:: FL=1 :: IF FF=0 THEN 320

```

```

300 F2=POS(A$,CHR$(K),1)-11
:: IF VF=1 THEN GOSUB 400
310 GOSUB 520 :: N1=T :: DIS
PLAY AT(18,1):"SUBTOTAL":T
:: N2F,N2=0 :: FF=F2 :: GOTO
230
320 IF VF=0 THEN 330 :: VF,M
F=0 :: GOSUB 400
330 MF=0 :: FF=POS(A$,CHR$(K
),1)-11 :: GOTO 230
340 IF C=2 OR(FF=0 AND M1F=0
OR(C=4 AND M1F=0)OR FL=1 TH
EN 260
350 IF C=4 THEN EF=1 :: M2=M
:: N1F,MF=0 :: GOTO 230
360 IF VF=1 THEN GOSUB 400
370 IF EF=0 THEN 400
380 IF N2F=0 THEN MEM(M2)=N1
:: DISPLAY AT(M2+2,11):N1
:: GOTO 220
390 GOSUB 520 :: MEM(M2)=T
:: DISPLAY AT(M2+2,11):T ::
GOTO 220
400 GOSUB 520 :: DISPLAY AT(
15,C):T :: GOTO 220
410 DISPLAY AT(R,1):""::""
:: GOTO 220
420 MEM(1),MEM(2),MEM(3),MEM
(4),MEM(5)=0 :: FOR R=4 TO 1
2 STEP 2 :: DISPLAY AT(R,10)
:"" :: NEXT R :: GOTO 410
430 IF EF=1 AND MF=1 THEN 26
0
440 CALL KEY(3,K,ST):: IF ST
<1 OR K<49 OR K>53 THEN 430
ELSE CALL SOUND(50,500,5)::
M=K-40 :: DISPLAY AT(R,C):CH
R$(K):: C=C+1 :: MF=1 :: FL
=0 :: IF VF=1 THEN GOSUB 400
450 IF N1F=0 THEN M1F,N1F=1
:: N1=MEM(M):: IF ZF=1 OR DF
=1 THEN N1=VAL(N$&STR$(N1)):
DF,ZF=0 :: GOTO 230 ELSE 2
30
460 IF N2F=0 THEN N2F=1 :: N
2=MEM(M):: IF ZF=1 OR DF=1 T
HEN N2=VAL(N$&STR$(N2)):DF
,ZF=0 :: GOTO 230 ELSE 230
470 GOSUB 520 :: MEM(M)=T ::
DISPLAY AT(M+2,11):T :: 6
OTO 220
480 IF DF=0 AND ZF=0 THEN NX
=N ELSE NX=VAL(N$):: DF,ZF=0
490 IF N1F=0 THEN N1=NX :: N
1F=1 :: GOTO 510
500 N2=NX :: N2F=1
510 VF,N=0 :: N$="" :: RETUR
N
520 IF FF=1 THEN T=N1+N2 ELS
E IF FF=2 THEN T=N1-N2 ELSE

```

```

IF FF=3 THEN T=N1*N2 ELSE IF
FF=4 THEN T=N1/N2 ELSE T=N1
*N2/100
530 RETURN

I have always been annoyed
by the difficulty of hyphen-
ating with TI-Writer, when I
want to avoid the gaping
holes that wraparound and
Fill and Adjust can cause.
Manually filling and adjust-
ing with carets is slow, and
leaving a space after the
hyphen is unreliable, so I
wrote this program.

100 DISPLAY AT(2,10)ERASE AL
L:"TIGERCUB": " HYPHENATED F
ILL AND ADJUST"
110 DISPLAY AT(6,1):" Prepar
e text with TI-Writer": "Edit
or. Leave left TAB at 0,": "s
et right TAB at the actual"
:"value of the line length d
e="
120 DISPLAY AT(10,1):"sired
(i.e., for a 28-char": "lin
e, set it at 20)."
130 DISPLAY AT(12,1):" Inden
t as desired. Center": "hea
dings as desired but be": "
sure to follow them with a
": "line feed (Enter). Hyphen
ate"
140 DISPLAY AT(16,1):"as de
sired and follow the": "hyp
hen immediately with a": "
line feed (Enter)."
150 ON ERROR 160 :: GOTO 170
160 ON ERROR 160 :: RETURN 1
70
170 DISPLAY AT(20,1):"INPUT
FILE? DSK" :: ACCEPT AT(20,1
6)BEEP:F$ :: OPEN #1:"DSK"&F
$,INPUT
180 DISPLAY AT(22,1):"OUTPUT
FILE? DSK" :: ACCEPT AT(22,
17)BEEP:N$ :: OPEN #2:"DSK"
&N$,OUTPUT
190 DISPLAY AT(24,1):"LINE L
ENGTH?" :: ACCEPT AT(24,14)V
ALIDATE(DIGIT):L
200 LF$=CHR$(13):: H$="-"&CH
R$(13)
210 ON ERROR 210 :: GOTO 220
220 ON ERROR 210 :: RETURN 3
10
230 LINPUT #1:M$ :: IF M$="
" OR M$=LF$ OR M$=" " OR ASC(

```

```

M$)>127 OR(LEN(M$)=L AND POS
(M$,LF$,1)=0)OR POS(M$," ",1
)=0 THEN 310
240 IF POS(M$,LF$,1)<0 AND
POS(M$,H$,1)=0 THEN 310
250 IF POS(M$,H$,1)<0 THEN
M$=SEG$(M$,1,LEN(M$)-1)
260 IF LEN(M$)=L THEN 310
270 P=1
280 X=POS(M$," ",P):: IF X=P
THEN P=P+1 :: GOTO 280 ELSE
Y,P=X :: IF POS(M$," ",P)=0
OR P=L THEN 310
290 M$=SEG$(M$,1,X)&"&SEG$(
M$,X+1,255):: IF LEN(M$)=L
THEN 310 ELSE P=X+2
300 X=POS(M$," ",P):: IF X=0
THEN P=Y :: GOTO 300 ELSE 6
OTO 290
310 PRINT #2:M$ :: IF EOF(1)
<>1 THEN 230 ELSE CLOSE #1
: CLOSE #2

Here is one for the pre-
schoolers -
100 CALL CLEAR :: CALL SCREE
N(14):: CALL COLOR(1,11,11,1
2,5,5):: DISPLAY AT(3,10):"S
EE-N-SAY" :: "PRESS ANY KEY
" !by Jim Peterson based on
a routine by Michael Lyons
110 DIM E$(16),PAT$(16):: CA
LL CHAR(123,RPT$( "F",16))
120 DATA " ", " {", " { {
", " { { {", " { { { {
", " { { { { {", " { { { { {
", " { { { { { {
130 FOR J=0 TO 15 :: READ PA
T$(J):: NEXT J
140 CALL KEY(0,K,S):: IF S=0
THEN 140
150 CALL CHARPAT(K,CP$):: FO
R X=1 TO 16 :: Y=ASC(SEG$(CP
$,X,1)): E$(X)=PAT$(Y+(Y>57
)-7-40):: NEXT X :: IF K>96
AND K<123 THEN K=K-32
160 CALL CLEAR :: CALL SAY(C
HR$(K)): FOR X=2 TO 16 STEP
2 :: DISPLAY AT(8+(X/2),12)
:E$(X-1);E$(X): NEXT X
170 CALL SAY(CHR$(K)): GOTO
140

```

And so, one more time

MEMORY FULL

Jim Peterson

TIPS FROM THE TIGERCUB

#41

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any 3 for \$35, all 4 #
for \$42, postpaid. #

This will be the last issue of the Tips from the Tigercub.

I started this newsletter over 3 years ago, as a means of promoting my software business. It has never been a success for that purpose, but I have kept it going because of the many interesting newsletters that I have received in exchange, and the many friends that I have made around the world.

I know, from the editors' comments in many of your newsletters, that many of you are finding it difficult to finance a newsletter for your shrinking membership, and even more difficult to find the time, and the material to print. For a one-man user's group pretending to be a business which is getting very little business, it has become impossible. User group members have never been good customers for anyone's software, for reasons which you all know, and those who are remaining active in the TI world are wanting more sophisticated software than I have to offer.

Some of you have offered to subscribe to my Tips, but I just don't have the time to get involved in anything like that. I have had some other projects on the back burner for too long, and it's time I got to work on them - they can hardly turn out to be less profitable than trying to sell software!

I am NOT going out of business, and I am NOT releasing my programs to the public domain. I will continue to sell them, and will continue some classified advertising.

My heartfelt thanks to the many user group editors and officers who have tried in many ways to encourage and help me. Many thanks to those who have purchased my programs.

I will greatly miss your

newsletters. I do hope to keep in contact with some of you. Perhaps now I can find time to browse in the TI sections of CompuServe or GENIE, and perhaps I will meet you there.

The answer to the challenge in the last Tips? For a clue, try -

DISPLAY AT(24,1):0 in Basic. Still don't get it? In Basic, DISPLAY is the same as PRINT, but AT is not recognized, so the computer thinks you are telling it to print the variable AT(1,1) - which, being undefined, is 0 - and advance to the next line (the ;) and print 0.

I have always wanted a pocket calculator with several memories and a window to display the contents of each one. So, since there is plenty of room for windows on a TV screen, I wrote one.

It does not require any use of the Enter key, but each CALL KEY input must be validated and processed, so don't type too fast. It will accept such inputs as M1=7= or M1=7+1= or M2=1-M1= to put a value in a memory, or 6+7= or 6+M2= to calculate and display, or 6+7M1 or M1-.M2M3 to calculate and put into memory, and will even do multiple calculations such as 1+2-3/4*5%6, subtotaling after the first two.
100 CALL CLEAR :: CALL SCREE
N(5):: DEF S*(X)=SEG*(A*,X,1
)&" = " :: CALL PEEK(8198,A)
:: IF A<>17# THEN CALL INIT
110 CALL LOAD(-31886,16):: O
N WARNING NEXT :: GOTO 140
120 SET,M*(),K,S,A*,S*(),R,C
,N,N1,N2,N1F,N2F,M1F,M,MF,DF
,FF,VF,EF,FL,N*,F2,T,N2,MEM()
,ST,NX,ZF
130 CALL COLOR :: CALL CHAR
:: CALL KEY :: CALL SOUND !0
P-
140 FOR SET=0 TO 4 :: CALL C