(Ø94) VAST 99 9702

from:

The
Vast 99
Users Group

Happy
Valentines
Day

NEWSLETTER

VOL. 3 FEBRUARY 14, 1987 NO. 2

CONTENTS

VAST BBS 437-4335

----------FEBRUARY, 1987----------

VAST 99 INFORMATION

The VAST 99 USERS' GROUP is a support group for TI 99 Home Computer users. We meet on the second Saturday of the month, at the Los Olivos Resort Motel in the "Phoenix" room at 202 E. McDowell Road (just East of the Library). The meetings start at 10:00 AM and continue until 11:00 AM with socializing starting at 9:00 AM. The yearly membership fee is $6.00.

All meetings are open and anyone may attend. Only dues paying members may vote in elections and obtain programs from the Users' Group library.

The current officers are:

President
Gerry Kennedy.....992-7668
Vice-President
Doug Otten.....973-7768
Secretary
Mike Marfisi.....897-8280
Treasurer
Ike Van Kampen.....934-5164
User Group Librarian
Earl Bonneau.....269-3802
Newsletter Editor/BBS SysOp
Jim Ely.....437-1796

****

A FORTH Tutorial is being conducted by Rene' LeBlanc in this newsletter. It consists of a continuing series of articles relating to his version of FORTH which is available from the User Group Library. For more information, please contact him at (602) 991-1403.

The Users' Group's BBS is now in operation 24 hours a day. Contact it at (602) 437-4335. There is a lot of interesting conversation and information available here so give it a try.

Deadline for submission of articles or advertising for the Newsletter is the first Saturday of every month. Articles may be submitted in any form, however, the preferred method is by phone transfer directly to the Editor.

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Advertising rates are as follows:

Commercial:

Full Page $10.00
Half Page $ 7.00
Quarter Page $4.00

Personal:

Four lines,
30 Characters/line
$1.00
$.20 per line
over four.

All rates are for **ONE** issue only!

****

Programs are available from the USERS' GROUP LIBRARY at the following rates:

SS/SD Disk $2.00
SS/DD Disk $4.00
DS/SD Disk $4.00
DS/DD Disk $8.00

If copying of documentation is required, it will be at the rate of $.10 per page. If the User Group supplies the disk, please add $1.00 to the above charges. An exchange program for free programs is also in effect. Please contact the librarian for further information.

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*
* Valley of the Sun TI99 Users Group *
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----------FEBRUARY, 1987----------

From the Editors Desk

M I N U T E S
JANUARY, 1987
****

The January, 1987 meeting of Vast 99 was held in the Fiesta Room of t h e Los Olivos Resort M o t e l on January 10th. T h e room change was the result of an electrical problem in our usual room.

Gerry Kennedy began the meeting with the announcement of t h e passing of Charlie Sutton. Charlie passed away in his sleep. A card w a s passed to those present f o r their signatures.

Gerry read some info from some of the BBS's regarding developements from Miller Graphics. Also more speculation about the 9640 Computer coming from MYARC.

Gerry asked for suggestions on what type of demos etc. we would like to see at meetings in t h e future. There was some interest in Forth. Gerry and Rene' suggested some books that members could read to help with Forth and we will explore the possibility of some more meeting time being used to demo this language.

The formal part of the meeting ended at about 11:00 AM and then Mike Marfisi showed the group the new RAVE 99 keyboard. This was followed by a demo by Doug Otten of a new program that allows instances from TI Artist to be used in X-Basic programs.

I forgot to include the changes to the membership roster in the January issue of the newsletter. So, here are the changes for December and January.....

.....
COMINGS AND GOINGS FOR DECEMBER 1987
.....

COMINGS.....WELCOME!!

LEO BAKER
6521 W. Mountain View,
Glendale, AZ. 85302,
931-9010

DAVID GABEREL
5219 E. Delta,
Mesa, AZ.

A big bye bye to.....

JERRY ESTERHOUSE
PAUL KNIGHT
ALLEN KNOLL
KEN WILLIS

.....
COMINGS AND GOINGS FOR JANUARY, 1987
.....

A big VAST 99 welcome to our newest member. Please add to your list:

HOWARD ANTHONY
5325 W. Altadena,
Glendale, Az 85304,
878-4945

Also bid a fond farewell to:

Tom Dugan
Bob Lickty

and to.....

Our Vice-President,
DOUG OTTEN

Remember if you want a complete list of the membership, please send me a SASE.

Mike Marfisi,
Secretary

****

HAPPY VALENTINES DAY!

IN THIS ISSUE

Here's what's in this issue of the newsletter...

Floating Point Numbers and support in the FORTH language are the topic of Rene's WHEREFORTHS column this month. It starts on page 4. After taking an UNAUTHORIZED month off, Tom Moran's COMPUTER TUTOR column is back on page 6 w i t h a game just f o r Valentine's Day. Remember last month when Mike Marfisi demo-ed his new RAVE 99 Keyboard at the meeting? Well, this month Mike does a review of this fine item. It starts on page 7. HINTS AND TIPS on page 8 starts a 10 part series of articles on TMS 9900 Assembly Language. These articles are written by Steve Royce of the Western NY 99ers Users' Group. And that's what's in this issue...

NEWS NOTES

As was promised by MG (Miller Graphics), on January 16, 1987 they announced their partner in the NEW IBM/TI compatibility venture. It is Triton Products Co. of San Francisco, CA. The system involves a special XT c l o n e and a Bridge Box to link it to the TI. As I understand it, it uses the keyboard of the TI and works in either TI Mode or XT Mode. The Bridge Box is designed by MG and is being manufactured by Triton. The special XT clone is being made to Triton's specifications by someone else. The whole system is called the "TI Turbo XT" and h a s 256K memory, 1 half height, 360K floppy disk drive and a color graphics adapter. The whole system sells for $499 + $19.90 for shipping and handling. Triton is answering ALL questions regarding this system. If you would like a 6 page, 4 color brochure on this, you can reach Triton at 1-800-227-6900 Monday - Friday 6AM - 6PM or Saturday 9AM - 4PM Pacific Time. Delivery is scheduled to start March 1, 1987. WOW!

On an aside, most of you have heard that MG is going to be dropping the Gram-Kracker. It seems that if demand is still high, Triton may take over the manufacture of this item in a slightly different case. We will have to wait and see on this one....

I got a note from MICRO-BIZ HAWAII the other day stating that they are now carrying a self re-inking ribbon cartridge in styles to fit most printers. I have heard of these cartridges, but this is the first I have seen them available anywhere. Interested?? MICRO-BIZ HAWAII'S address

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----------FEBRUARY, 1987----------

WHEREFORTHS OF FORTH

This month let us examine TI-Forth's Floating Point number support. TI-Forth provides a number of primitives which access the same TI-99 ROM Floating Point routines that are used by BASIC and XBASIC, thus providing the excellent high-precision numeric calculations the TI-99 has become known for. The Floating Point Forth primitives are covered in Chapter 7 of the TI-Forth User Manual, but I will try to approach it with a slightly different organization and then give some examples.

The TI-Forth Floating Point Primitives provide a number of useful capabilities:

(1) input floating point numbers to the stack

(2) manipulate them on the stack and move them between the stack and memory in the same ways ordinary 16 bit integers may be manipulated in Forth

(3) display floating point numbers from the stack in a variety of formats

(4) perform comparisons between floating point numbers on the stack

(5) perform arithmetic and transcendental functions of floating point numbers on the stack in Forth-consistent suffix (Reverse Polish) notation

(6) optionally allow arithmetic functions to be performed directly in the CPU RAM "Registers" FAC (Floating Point Accumulator) and ARG (Floating Point Argument)

(7) convert from a 16-bit integer on the stack to a Floating Point number on the stack or in the FAC

(8) convert from a Floating Point number in the FAC or on the stack to a 16-bit integer on the stack

(9) convert from a 16-bit integer on the stack to a Floating Point number on the stack or in the FAC

INPUT OF FLOATING POINT NUMBERS

>F Usage: >F 1234 - enters 1234 as a floating point number on the stack.

Other Possible Usage:
>F 12.34
>F -1234.56
>F 1.234E-6
>F 1234567890E88

STACK MANIPULATION

Usage will be shown as:

<WORD> (stack-before -- stack-after)

S->F Usage: S->F (n -- fpn)
Converts 16-bit integer on stack to Floating Point Number on stack

F->S Usage: F->S (fpn -- n)
Converts Floating Point Number on stack to 16-bit integer on stack

F@ Usage: same as @

F! Usage: same as !

FDUP Usage: same as DUP

FDROP Usage: same as DROP

FOVER Usage: same as OVER

FSWAP Usage: same as SWAP

DISPLAY OF FLOATING POINT NUMBERS

F. Usage: F. (fpn --)
* Integers representable exactly are displayed without a trailing decimal.
* Fixed point format is used for numbers in range.
* Exponential format is used for very large or very small numbers.

F.R Usage: F.R (fpn cnt --)
Displays fpn right-justified in a field cnt characters long

FF. Usage: FF. (fpn len pos --)
Displays fpn as a floating point number with len characters displayed and pos characters after the decimal point

FF.R Usage: FF.R (fpn len pos cnt --)

Displays fpn as a floating point number with len characters and pos characters after the decimal point right-justified in a field cnt characters long

FLOATING POINT NUMBER COMPARISONS

F0< Usage: F0< (fpn -- f)
f is true if fpn is negative

F0= Usage: F0= (fpn -- f)
f is true if fpn is zero

F> Usage: F> (fpn1 fpn2 -- f)
f is true if fpn1 > fpn2

F= Usage: F= (fpn1 fpn2 -- f)
f is true if fpn1 = fpn2

F< Usage: F< (fpn1 fpn2 -- f)
f is true if fpn1 < fpn2

ARITHEMETIC & TRANSCENDENTAL FUNCTIONS

F* Usage: F* (fpn1 fpn2 -- fpn1*fpn2)

F/ Usage: F/ (fpn1 fpn2 -- fpn1/fpn2)

F+ Usage: F+ (fpn1 fpn2 -- fpn1+fpn2)

F- Usage: F- (fpn1 fpn2 -- fpn1-fpn2)

INT Usage: INT (fpn1 -- fpn2)
Returns largest integer <= fpn1

^ Usage: ^ (fpn1 fpn2 -- fpn3)
Eg: >F 1234.56 >F 3.5 ^
Raises 1234.56 to the 3.5 power

SQR Usage: SQR (fpn1 -- fpn2)
fpn2 is the square root of fpn1

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WHEREFORTHS OF FORTH CONTINUES...

EXP Usage: EXP (fpn1 -- fpn2)
fpn2 is "e" raised to the fpn1 power
LOG Usage: LOG (fpn1 -- ln[fpn1])
COS Usage: COS (fpn1 -- cos[fpn1])
SIN Usage: SIN (fpn1 -- sin[fpn1])
TAN Usage: TAN (fpn1 -- tan[fpn1])
ATN Usage: ATN (fpn1 -- atn[fpn1])

FLOATING POINT "REGISTER" OPERATIONS

>ARG Usage: >ARG (fpn --)
Moves fpn from stack to ARG
>FAC Usage: >FAC (fpn --)
Moves fpn from stack to FAC
FAC>ARG Usage: FAC>ARG (--)
Moves fpn in FAC to ARG
S->FAC Usage: S->FAC (n --)
Converts 16-bit integer on stack to floating point number in FAC
SETFL Usage: SETFL (fpn1 fpn2 --)
Moves fpn2 to FAC and fpn1 to ARG
FMUL Usage: FMUL (--)
Multiplies fpn2 in FAC by fpn1 in
ARG and leave result in FAC
FDIV Usage: FDIV (--)
Divides fpn2 in FAC by fpn1 in ARG and leave result in FAC
FADD Usage: FADD (--)
Add fpn1 in ARG to fpn2 in FAC
FSUB Usage: FSUB (--)
Subtract fpn1 in ARG from fpn2 in FAC
FLERR Usage: FLERR (-- n)
Returns floating point error status register to stack
?FLERR Usage: ?FLERR (--)
Prints error message if previous floating point operation caused error

The little floating point exercise below will demonstrate the use of some of the floating point words. After loading that screen, just type DEMO to try it out. Note that the word -FLOAT will bring in the floating point routines from the TI Forth disk, but you must be in the first drive (DR0) for it to properly find it. If you have two drives and have put your DEMO screen on a disk in the second drive, there are a couple of ways to handle the loading properly:

(1) Remove the -FLOAT from your DEMO screen, then type "DR0 -FLOAT" (Don't type the quote marks). This will load in the floating point routines from your Forth disk. Then, assuming you have your DEMO screen on screen 17 of a disk in your second drive, type "DR1 17 LOAD".

(2) Leave the -FLOAT on your DEMO screen. Simply type "DR0 DISK_SIZE @ 17 + LOAD", and everything should load up ok.

Once you get this screen to run properly when you type "DEMO", I suggest you try modifying it to experiment with other floating point features in Forth. Good luck, and enjoy!

Rene' LeBlanc

```
\ FLOATING POINT EXERCISE

-FLOAT \ Load Floating Point Routines
: DEMO TEXT ." I  SIN(I)  e#I  (e#I)#2 "
   CR
   17 0
   DO CR I 2 U.R SPACE
      I S->F FDUP SIN 12 F.R EXP FDUP 12 F.R >F 2 # F.
   LOOP CR ;
```

----------FEBRUARY, 1987----------

First, I want to thank everyone for all the wonderful comments on the January, 1987 Computer Tutor column. The consensus was that this was the best column I've ever done! (Ooops. I didn't write a January column. What does this all mean?)

Anyway...to make up for no column last month, I've put together a special program for Valentines Day. I call it BOYCHASER! You can call it anything you want. Perhaps if you're a female you would like to call it GIRLCHASER. Since I wrote this thing, we'll go with BOYCHASER. Whichever way you go...it will work the same.

```
90 GOTO 100 :: CALL COLOR ::
 T,R,C,X,Y,D :: Y$ :: M$ ::
CALL SCREEN :: CALL SOUND ::
 CALL HCHAR :: CALL KEY :: C
ALL CLEAR :: CALL CHAR :: K,
ST
92 !@P-
100 CALL CHAR(129,"1818FFBDB
D2424E7",136,"1818FFBDBD2424
E7",126,"42E7FFFFFF7E3C18"):
: CALL COLOR(13,6,15,14,9,15
,12,7,15)
110 X,Y=1 :: R,C=5 :: CALL C
LEAR :: CALL SCREEN(15)
120 FOR K=1 TO 5 :: FOR ST=1
 TO 5 :: CALL HCHAR(5*K-4,5*
ST+2,46):: NEXT ST :: NEXT K
130 PRINT TAB(10);"DIRECTION
 NSEW:";
140 CALL HCHAR(5*R-4,5*C+2,1
29):: CALL HCHAR(5*X-4,5*Y+2
,136)
150 FOR T=1 TO 25 :: CALL SO
UND(30,800,1):: CALL SOUND(1
5,600,1)
160 CALL KEY(3,K,ST):: IF ST
=0 THEN 160
170 CALL HCHAR(24,28,K):: CA
LL HCHAR(5*R-4,5*C+2,46):: M
$=CHR$(K)
180 IF M$="N" THEN R=R-1 ELS
E IF M$="E" THEN C=C+1 ELSE
IF M$="S" THEN R=R+1 ELSE IF
 M$="W" THEN C=C-1
190 IF (R*C=0)+(R>5)+(C>5)TH
EN 200 ELSE 210
200 CALL CLEAR :: PRINT "YOU
 COMMITTED SUICIDE RATHERTHA
N BE CAUGHT. TSK TSK     WAN
T TO TRY AGAIN":: GOTO 320
210 CALL HCHAR(5*R-4,5*C+2,1
29):: CALL HCHAR(5*X-4,5*Y+2
,46)
220 IF (R=X)*(Y=C)THEN DISPL
AY AT(24,1):"SHE GOTCHA!  PL
AY AGAIN     ":: CALL HCHAR(
5*R-4,5*C+2,126):: GOTO 320
230 IF (X=R)*(Y<C)THEN D=1 E
LSE IF (X>R)*(Y<C)THEN D=2 E
LSE IF (X>R)*(Y=C)THEN D=3 E
LSE IF (X>R)*(Y>C)THEN D=4
240 IF (X=R)*(Y>C)THEN D=5 E
LSE IF (X<R)*(Y>C)THEN D=6 E
LSE IF (X<R)*(Y=C)THEN D=7 E
LSE IF (X<R)*(Y<C)THEN D=8
250 D=D+INT(3*RND-1):: IF D=
0 THEN D=8 :: GOTO 260 ELSE
IF D=9 THEN D=1
260 IF (D>1)*(D<5)THEN X=X-1
 ELSE IF D>5 THEN X=X+1 ELSE
 IF (D>3)*(D<7)THEN Y=Y-1 EL
SE IF (D<3)+(D=8)THEN Y=Y+1
270 IF X=0 THEN X=X+1 ELSE I
F Y=0 THEN Y=Y+1 ELSE IF X=6
 THEN X=X-1 ELSE IF Y=6 THEN
 Y=Y-1
280 IF (X<1)+(X>5)+(Y<1)+(Y>
5)THEN CALL CLEAR :: PRINT "
OUT OF BOUNDS!" :: GOTO 320
290 IF (X=R)*(Y=C)THEN DISPL
AY AT(24,1):"SHE GOTCHA!  PL
AY AGAIN     ":: CALL HCHAR(
5*R-4,5*C+2,126):: GOTO 320
300 CALL HCHAR(5*X-4,5*Y+2,1
36):: NEXT T
310 CALL CLEAR :: PRINT "YOU
 ESCAPED THE CLUTCHES OF MAT
RIMONY! CONGRATULATIONS."
320 INPUT Y$
330 IF Y$="Y" THEN 100 ELSE
END
```

Here's the way you play. After loading and running the program you will see a 5x5 grid on your screen. In the lower right hand corner is the boy (that's your man) and in the

COMPUTER TUTOR CONTINUES...

upper left hand corner is the girl (that's the enemy).

You can move North, South, East or West or just stand still if you'd like. You move by pressing the "N" key for North, the "S" key for South, etc. After you move, the girl will begin to chase you. The object of this little ditty is to keep out of the matrimonial clutches of this girl. She has 25 moves in which to trap and catch you. If she does, a bright red heart appears at the place of capture and you marry her. If you avoid her for 25 moves you will see a warm congratulatory message on your screen with the option to play this risky game again.

OPTIONS: There are two options other than moving in a NSEW direction. Pressing any other key will keep you in the same location... but the girl gets to move closer to you. This is dangerous, unless of course you want to be caught. Another option, should you feel trapped and about to be caught, is to jump off the grid. Of course you will be killed... but then some consider marriage a fate worse than death. That option is yours!

The girl moves with some logic, although occasionally she moves randomly, without much thought as to where you are. Just like a woman, huh?

You can key-in this program or download it from the VAST BBS by calling 437-4835. You will find it in the files section, titled VALENTINE.

Please! No letters from NOW or others accusing me of being sexist. I did say you can call this thing GIRL-CHASER and simply change the statement that says "SHE GOTCHA" to "HE GOTCHA". This is an equal opportunity marriage program!

Have fun!!

Happy Valentines Day!

Tom Moran

VIEWS AND REVIEWS

At the January meeting, I showed you what Santa had brought me for Christmas last year. It was the RAVE 99 replacement keyboard for the TI computer. I thought I would take a little more time this month and give you a more detailed description and review of this new product. I have the Model 101. There are 2 models, this one being the bigger one with more features.

One big drawback of the 99 is its downsized keyboard. As you all know, there are fewer keys than on a standard computer or typewriter keyboard. This can make things somewhat inconvenient at times. For someone who is a fast touch typist, this can be very frustrating. Also, this necessitates double and, in some cases, triple keystrokes to accomplish some functions. Another problem with the 99 is the cables that are needed to connect the console to the expansion system, power supply, joysticks and monitor. This can make for a very crowded work station. Well... along comes the RAVE 99 with a solution to these problems.

When Santa delivered my RAVE, I ripped open the box and found the keyboard, an instruction manual, a printed circuit board, and a black plastic cover plate. I am the worlds biggest klutz when it comes to electronics, so I was a little scared at the prospect of altering my 99. I read the instructions through and figured, what the heck! With screwdriver in hand, I removed the screws from the bottom of my 99 and removed the case. A few more screws and removal of one plug and my old keyboard was in my hands. Easy so far! But then I never had problems getting things apart!

The new circuit board screwed into the same holes as the old keyboard. The jack on the RAVE plugged into the same jack as the 99. With two nylon screws (supplied), I then installed the plastic cover (a $4.00 option) over the hole left by the 99 keyboard. Then all that was left was to re-assemble the case. Oh Oh... here comes trouble for Mr. Klutz... but no problem!

I reconnected my console to its cords and tucked it out of the way on top of my PE box. Remember, the RAVE replaces only the keyboard of the 99. You still need the console because THAT is the computer. Lastly the phone type jack on the end of the 5 ft coil cord from the RAVE was plugged into the console and I powered up.

Fear... sweatty palms... knocky knees... But there was the ol' TI title screen just as it always had been. I pressed (finger trembling) a key... the normal menu appeared. By golly, I think I did it!

Now, I played. I explored. I read the manual. I fell in love. By gawd, there is a Santa Claus. This thing is GREAT!

The RAVE keyboard looks very much like a Commodore keyboard in size and shape. The first row of keys along the top are a "set up" key, followed by 11 function keys and 4 "edit" keys. They are: char insert, char delete, line insert and line delete. What follows is a standard typewriter keyboard with some additions. There is a "window" right, up and down; break, delete, arrow, plus forward and back tab keys. The keyboard keys are rounded out with control, function and print keys. To the right of the typewriter keyboard we find a complete 17 key number pad. The top 3 keys are math functions (plus, multiply and divide).

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FEBRUARY, 1987

HOME AND TIPS

TI 99/4A ASSEMBLY LANGUAGE TUTORIAL

BY STEVE ROYCE - Western NY 99'ers

(SAVING BYTES) Lesson #1

This installment of Dis'Assembler will look at one of the two main aspects of the efficiency of Assembly Language: its memory-saving ability. We'll use a fairly simple example which uses only a few Assembler directives and instructions. Our objective will be to place the letter 'A' in the center of the video monitor. In TI Basic or Extended Basic this is a fairly simple proposition, as the following Extended Basic example shows:

```
100 DISPLAY AT(12,16):"A"
110 GOTO 110
```

Simple enough, isn't it? However, your 99/4A really has no idea what these statements mean until they are interpreted into its own language, the powerful internal machine language. Assembly language is a means of producing already-translated instructions to the computer, thus avoiding the slowness and memory consumption which comes from interpreting a program as it is being run. So, let's write a program which does the very same thing and follows the same logic as the Extended Basic example above. To do this, we need only to understand a few instructions in TMS9900 Assembly Language. Since most of my readers own the Editor/Assembler (E/A) and not the Mini-Memory (M/M)**, I'll present the E/A version, as follows. Before you get started, though, let's do a little bit of disk housekeeping to make things easy for ourselves. If you are working with one disk drive, you should copy the following files from the E/A disk to an initialized disk: ASSM1, ASSM2 and EDIT1. We will use this same disk to enter our source code and assemble the object code. This will make switching disks back and forth unnecessary as you go along. Note that the line numbers will be provided by the Editor, not by you:

```
0001        DEF LETTER
0002        REF VSBW
0003 LETTER LI R0,367
0004        LI R1,>4100
0005        BLWP @VSBW
0006        LIMI 2
0007        JMP $
0008        END LETTER
```

My God! Eight lines to do what can be done in Extended Basic in two lines. How can Assembly Language claim to save memory space. Well, the above coding takes only eighteen bytes of memory, compared with thirty-three for the Ex-Basic version. So much for my proof; now let me explain each of these lines.

```
0001        DEF LETTER
```

This line tells the system what the name of the program is. I have chosen to call it 'LETTER'.

```
0002        REF VSBW
```

Means that I am going to REFerence an external (meaning outside of my program) symbol. In this case, I am going to be calling the Utility Routine which is labeled VSBW (for Video Single Byte Write). The VSBW routine prints a single byte to a location in the Video Display Processor.

```
0003 LETTER LI R0,367
0004        LI R1,>4100
```

These two lines define the parameters to be passed to the VSBW routine. We are using the LI (Load Immediate) instruction to load each of these registers with the appropriate value to be used in the VSBW routine. The VSBW routine always requires that certain values to be in Register 0 and Register 1 of the calling program. In Register 0, the VDP Address to be written to must be placed. How did we come up with 367 to be loaded here? The first thing you must know is that the first 768 bytes of the VDP define the 768 possible locations on the screen, starting with the upper left hand corner (VDP Address 0 or Hex >0000). You remember your Hexadecimal Arithmetic from last month, don't you? (I will try to have this article in next month's issue. Ed.) The first row is therefore numbered 0 to 31 (or Hex >0000 to >001F) and the last row 736 to 767 or Hex >02E0 to >02FF. How do we convert a row and column of Basic or Ex-Basic to a VDP Address? A simple equation will do this for us:

```
ADDRESS=32*(ROW-1)+COLUMN-1
```

Row 12, Column 16 thus equates to VDP Address 367, or Hex >16F. You can enter it either way:

```
LI R0,367 or
LI R0,>16F
```

The use of the label 'LETTER' at line 0003 tells the system that this is the first executible instruction of the program. The REF and DEF directives are not executible instructions, only informative directives. Similarly, TEXT and DATA directives are not executible.

The VSBW routine requires that the byte which is to be written be in the Most Significant Byte (MSB) or the left half of R1. Since we wish to write the letter 'A', we must put the ASCII Code for the letter A in the MSB of R1. The letter A is ASCII code 65, or Hex >41. So, LI R1,>4100 places the

HINTS AND TIPS CONTINUES...

correct code into R1.

```
0005        BLWP @VSBW
```

Now that R0 and R1 are properly loaded, we can access the VSBW routine, using the BLWP instruction. BLWP stands for Branch and Link Workspace Pointer, and calls a subprogram with its own set of workspace registers. It may be considered analogous to a Subprogram call in Basic.

```
0006        LIMI 2
```

LIMI is the Load Interrupt Mask Immediate instruction. The only options are LIMI 0 (the default) and LIMI 2. All LIMI 2 does in this program is allow you to use the 'QUIT' key when you tire of the program. However, interrupts must be disabled using the LIMI 0 instruction whenever you access a video routine such as the VSBW routine. If LIMI 2 were active when the program encountered line 0005, the results would be totally unpredictable.

```
0007        JMP $
```

JMP is the unconditional JuMP instruction. The dollar symbol means 'the current location counter', so JMP $ means jump to the current location, or stay here. A Basic equivalent is:

```
150 GOTO 150
```

```
0008        END LETTER
```

The END directive of course means just that. The program name after the END directive allows the program to run immediately after being loaded, without further input from you.

So, there it is. Save the source code, assemble it into an object file, then load the object file. Since the E/A manual is a little fuzzy on this, here it is step by step:

After inputting the source code, press 'FCTN-9' twice, then select '3' for SAVE. Answer 'Y' to the format prompt, and call it 'DSK1.SOURCE'. Once saved, press 'FCTN-9' again, and select '2' for Assemble. Answer 'Y' to the LOAD prompt, thus loading the Assembler. The source file name is DSK1.SOURCE, and call the Object file 'DSK1.OBJ'. The LIST FILE prompt asks you for your printer specifications if you want a listing of the assembly process. Incidentally, if you don't have a printer, get one if you intend to do any serious Assembly Language programming. It's impossible to debug an Assembly Language program without a written listing. The OPTIONS prompt must be answered with 'R' so the Assembler knows that your R's stand for registers. 'C' will compress the object code, thus saving space on your disk, 'L' means you want a printed listing, and 'S' will print a list of the symbols used in the program. If you have a printer, answer RLSC to the OPTIONS prompt; if not, answer RC.

Once the Assembler is done, press 'ENTER' to return to the E/A Selection List. Press '3' for LOAD AND RUN, and answer DSK1.OBJ in response to the FILE NAME prompt. WOW! The letter 'A' on your monitor.

Next time, we'll look at the other aspect of Assembly Language efficiency: its incredible speed. We'll write the equivalent to the following Extended Basic program:

```
100 FOR R=1 TO 24 :: FOR COL
=1 TO 32 :: CALL HCHAR(R,COL
,65):: CALL HCHAR(R,COL,32)::
 NEXT COL :: NEXT R :: GOTO
 100
```

**Ed Note: listing for Mini-Memory follows. It assumes the starting location is the MM usual >7D00. Execute out of the Easy Bug:

```
7D00 6024 VS EQU >6024  *VDP SNGL BYTE WRITE
7D00 02E0    LWPI >70B8 *WORKSPACE AT 70B8
7D02 70B8
7D04 0200 LT LI R0,367  *CENTER OF SCREEN
7D06 016F
7D08 0201    LI R1,>4100*PUT HEX41 IN MSB
7D0A 4100
7D0C 0420    BLWP @VS   *PRINT IT
7D0E 6024
7D10 0300    LIMI 2     *ENABLE FCTN/QUIT
7D14 10FF    JMP $      *STAY RIGHT HERE
             END
```

From the Editor Desk Continues...

is 98-1409 E. Kaahumanu St., Aiea, HI 96701 and their phone number, if you would rather call, is (808) 487-9491. By the way, they also carry the additional ink for the re-inking.

The New Jersey Area Computer Fair (TICOFF) is scheduled this year on March 28 and the TI FEST WEST Show is scheduled for May 15 and 16. I also got a note from the OTTAWA TI 99/4 USERS' GROUP of a TI-FEST in Nepean, Ontario, Canada on May 16. How can you say we have been orphaned? By the way, is anybody going to any of these computer shows?

The New MYARC 9640 Computer is due to begin shipping sometime around February 17, 1987 according to a conference on Compuserve with Lou Phillips. It seems that all the bugs have finally been worked out of MXB II (Myarc Extended Basic). However, some programs and software may still not work with it (example: FunnelWeb). The price for the 9640 is in the $400 - $500 range. The new Hard-disk and Quad Density disk drive controller card is due out around the end of February. It's price is in the $190 - $240 range. Seems this new controller can run up to 3 hard drives at a maximum of 130 MB per drive! (Did I read that right?) That's a lot of information. It also controls up to four floppies with densities up to QUAD. WOW! We'll just have to wait and see about the dates and claims. Maybe we really will see this computer after all....

The BBS is moving along nicely. Now that PC Pursuit is available into Phoenix, we are starting to receive a few out-of-state callers. Our message base number 2 for VAST 99 users has topped the 1000 message mark. I think it is pretty neat. We are averaging still about 80 to 100 calls a week. If you have a modem and haven't called, you should give it a try (If you can squeeze in between Ike's calls trying to get an automatic log-on program to work correctly. Lazy guy, wants the computer to do all the work and just sit back and watch... Also, we are in dire need of some **NEW UPLOADS.** PLEASE!!!!

Here's a note of interest to some of you. A couple of months ago, the group joined in a newsletter exchange with other TI User Groups around the country. We sent out about 150 newsletters the first month and about 100 the next. So far, we have received newsletters from about 50 other groups from the U.S. and Canada. This month we will discontinue sending to those groups which have not responded to our wish to exchange. The cost for this venture is borne by the group and, needless to say, it is expensive to send to those groups that don't send something back. Beginning at this month's meeting, you should find a few binders of newsletters from the other groups. These will be available for you to read and in some cases borrow and return at a later date. I think that if you take the time to take a look at some of them, you will find them interesting. You will also see why I am always harping for original articles for our newsletters. Enjoy...

ONE FINAL ITEM

Board elections for our group are fastly approaching (April). We need to start thinking about persons to take over the reigns for this coming year. I know the President's job is going to be open. Gerry Kennedy has done a fine job running this group from the beginning and is really looking to step down. It's been 3 years or so and he does need a rest (Can you see it in his eyes?). We do need some new people to take over. You can't expect the same people to continue in their positions forever. PLEASE!! Think about taking on a position on the BOARD of YOUR User Group (Anybody want to be newsletter editor?).

That's it 'til next month...

Jim Ely,
BBS SysOp,
Newsletter Editor

****

VIEWS AND REVIEWS

CONTINUED FROM PAGE 7

Below, 3 to a line, are the numbers. The last number row includes the zero, a comma and decimal point. There are 2 return (enter) keys, one to the right of the typewriter board and one on the number keypad. This is super convenient.

The folks at RAVE have designed this beauty with 4 built in "modes".

MODE 1 is for use in the "command/immediate" mode. The "function/quit" is disabled. How many times have you hit that by accident and lost a whole program? The frequently used quotation mark (") is available without having to use the shift key. The apostrophy (') becomes the shifted key. Mode 1 is where you would do any programming functions.

MODE 2 most closely emulates the standard TI keyboard. The "function" keys (F1 to F11) correspond to the 99/4A function+1 through function+= so you can use the regular overlay strip.

MODE 3 is used to run TI WRITER. Most of the commands are now single keystrokes using just the F1 to F11 keys. You can still use all the old methods if you want by hitting the function plus number keys but who would want to? Single keystrokes are also available to: "home cursor" - return the cursor to the top left of the screen, "escape" - same as "command/escape", "break" - left margin release. By

V I E W S A N D R E V I E W S CONTINUES

using the "shift" key with others, you can delete everything from the cursor to the end of the line or return the cursor to the beginning of the line. The 4 edit keys on the top row and the "window" keys are also active.

MODE 4 is used for MULTIPLAN. This mode makes almost all of the Multiplan commands available with one stroke. On the lower row there is a "print" key. Press it once and you are placed into the print menu. Press again and you will print whatever spreadsheet you are using with the options and parameters that are active in the sheet. Press a third time to cancel a printout.

There is an option available at a cost of $4 that allows a reset and load interrupt feature to be added so you can reset the system without switching off the console and send an interrupt signal for use with a screen dump program (when used with the proper software). This option requires a little soldering on the circuit board (not me brother!).

That's it. The features of this high quality hardware make it an extremely convienent and pleasant item to use. I am totally happy with it. I had absolutely no problem installing it. The manual is very clear and complete. I have found it necessary to call the folks at RAVE on 2 occasions and have found them to be very helpful and friendly. I get the impression that this is a sideline with them and that they work other jobs because each time I called I got a lady who told me that her husband would call me back in the evening when he got home from work.

The RAVE 99 Model 101 keyboard is priced at $164.95 (plus $4.95 if you want the console cover and I don't know who wouldn't so I don't understand why this is not included with all units). There is another model priced at $149.95 with fewer features.

Now we come to the question of value. Why would anyone spend almost $200 for something that really doesn't "add" anything to the computer? A good question that only you can answer. As for me, I use my TI for hours each day. I have no plans to buy the new Myarc computer when it becomes available because my TI does all that I need it to do right now. I am looking for comfort and convenience to make my time at the computer more productive and less frustrating. This unit makes it a pleasure to sit down to the computer. So for me, it was money well spent.

If anyone has any questions that are not covered here, just give me a call and I will try to answer them for you.

Mike Marfisi

******** N O T E S

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