CEDAR VALLEY 99er UG   JULY 1993

PRESIDENT: Jack Johns   (319) 366-4541
VICE PRES: Bob Wahlstrom   (319) 393-6042
TREASURER: Bruce Winter   (319) 393-0610
SECRETARY: Wayne Betts   (319) 377-2493
NL EDITOR: Gary Bishop   (319) 377-9574
LIBRARIAN: Bob Heiderstadt   (319) 927-4215

CEDAR RAPIDS/MARION

Supporting the TI-99/4A and 9640 in Eastern Iowa for over 10 years!

NEXT MEETING: 6:30 PM JULY 13, 1993
WEST MUSIC, COLLINS ROAD PLAZA

CONTENTS

Replacement Newsletter Editor Needed:

Your newsletter editor, Gary Bishop, would like to retire from his position before the fall meetings start. After 2+ years, it's time for someone else to try their hand at it. I have the process largely automated. The requirements are quite modest: a disk system with two drives, and a printer. The drives don't even have to be double sided; single sided drives will work just fine. When someone else takes over, I can provide plenty of inputs for newsletter use. Think about serving the club as the editor. My estimate is that about 3 to four hours per month is all that is required. Of course, the first issue will probably take a little longer to work the bugs out, but after that, the publication should run smoothly.

RECENTLY RECEIVED NEWSLETTERS:

West Penn June 93, rcvd 6-14; Cleveland Area 99er User Groups, June 93, rcvd 6-14; Chicago UG May 93, rcvd 5-5, June 93, rcvd 6-19; LA Topics June 93, rcvd 6-5; K-Town 99ers June 93, rcvd 6-14; CVCA June 93, rcvd 6-16, July 93, rcvd 7-12; A9CUG June 93, 6-9.

From the Editor: I received only one comment about including newsletter reviews in our newsletter, and that comment was from someone in a group we exchange newsletters with. Therefore, because our own members don't seem to want or need this information, I want to ask our reviewers to stop submitting their reveiws. Please continue to make submissions, but no need to provide the monthly synopsis. The reveiws below are the final listings as received through the publication date:

K-Town 99ers, Feb 93: Potpourri by Bill Sheridan, do you know what IC to use to repair a TI modulator? A repeatt of the article on modulator repair by Ron Warfield of BCUG tells all. Another 26 L. of the A. quiz. Hints are on page 7. Answers in the March 1993 K-Town 99er. The recipe for Special K bars. Chatterbox XXIV by Bob Buehler, Thats right, 2 years are now complete. Bob reminisces about the effort and other areas of endeavor. His recipe is Quick Microwave Fudge. The lost is found - The art of sector editing.

K-Town 99ers, May 93: Potpourri by Bill Sheridan, topic: frustration. Wants help reading/printing DF128 files downloaded from Delphi. Any help out there? Chatterbox 27 by Bob Buehler: topic - the annoyance of growing old and the recipe for Easy Beef Stew. Stumblings by Joe Simmons: More of a ramble though several topics instead of the usual stumblings. The only stumble he had to report was First Draft lock up from time to time. Also included is the membership list of the UG through March of 94 in case you would like to write any of their members.

K-Town 99ers, June 93: Not much to report on this one, President's forum - Potpourri, Chattterbox - all related to the Lima Faire. On line with E.M. Smith - John and Bob might read this one. Deals with direct modem transfer much like the demo at our June 93 meeting.

A9CUG Newsletter April 1993: Using GIF-Mania to convert .GIF files to TI-Artist format on page 2. Check out the use of a photograph on page 1.

A9CUG May 1993 Atlanta GA: GIF-Mania review on page 3, EIA RS232C serial communications standards. Includes pin numbers for DB25 plug, RS232C signals defined, typical uses, and null modem connections. All of the above reviews by Bill Paeth.

Direct Connect Demo Comments from Bill Paeth

Sorry to see the bug, guys. I really did enjoy your demo and sympathies with your frustration of not making connection the first time. We all have experienced trouble with programs like that and realize that the only way to solve it is to try again. Thanks for the demo.

This is a tutorial for those of you with Geneves or 99/4A's with
an 80 column (i.e. 9938) device attached to it. It is written
for those who want to begin to learn how to use the more advanced
featues of the V9938 that the 9918A does not offer.

This is a tutorial on using the V9938 in Graphics 4 mode. In
part 1, I will be explaining a program called LINES that was
written for the 9918A processor to demonstrate it's graphic mode.
This program came from TI with the Mini-Memory module. I will
extend this program to use Graphics 4 mode. In later tutorials,
we will try to increase the performance of this program using the
V9938's build in commands.

If there is sufficient interest, I will write parts two and three
and post them as well.

OVERVIEW OF GRAPHICS 4 MODE

In Graphics 4 mode, there is no Pattern Generator Table like we
have been used to in the 9918A. Instead, each pixel on the
screen is controlled by a 4-bit color assignment in the Pattern
Name Table. Therefore, each pixel can be one of 16 colors and
each byte in the Pattern Name Table describes two pixels on the
screen. The screen size is either 256 X 192 or 256 X 212 pixels
depending on the LN bit of VDP register 9. Therefore, the
Pattern Name Table will be 24,576 or 27,136 bytes respectively.
The Pattern Name Table can be located in only four areas of
memory. They are 0, >08000, >10000, >18000. The location is
determined by Register #2. For this program, the Pattern Name
Table will start at 0.

OVERVIEW OF THE LINES PROGRAM

The lines program is in basically three parts. One part
determines where the end points of each line will be. It then
calls another part which draws a line between the end points.
That part then calls another routine to plot each individual
point.

One pitfall that I encountered early on is addressing the VDP

memory. The 9918A had a maximum of 16KB and therefore used only 14 bits to address all of it's memory. The 9918A has 128KB of memory, thus needing 17 bits to address all of its memory. When using the standard VDP memory routines (e.g. VSBW,VSBR,VMBW,VMBR), you can only access 16KB of memory. As we saw earlier, Graphics 4 mode uses over 24KB of memory. Before using the routines VSBW,VSBR,VMBW, and VMBR, you must make sure the three high order bits of the address are set in VDP register 14 first.

Another problem I had was when writing repeatedly to VDPWD. Each time you write a byte of data, the VDP address gets incremented automatically. If you continually write past a 16KB boundry, R14 will get incremented so that the next time you make a call ro VSBW,VSBR,VMBW, or VMBR, it is acting on a different location in memory. Therefore, it is important to always write to VDP Register 14 before reading and writing VDP memory.

Finally, it is important to set VDP Register 14 back to zero before exiting. If not, when the system is reset, it will begin to write in high areas of VDP memory and your title screen will not appear right without another reset.

Now, on with the source code. If there are parts that are not clear, make a comment to me and I will try to clear it up in my next tutorial.

```
      REF   VWTR,VSBW,VMBW,KSCAN,VSBR
      REF   VDPWD,VDPWA,VDPSTA


HEIGHT EQU  212            NUMBER OF LINES
NUMLIN EQU  100            NUMBER OF LINES WE DRAW BEFORE ERASING SCREEN


* CLEAR THE SCREEN
*
* THIS ROUTINE CLEARS THE SCREEN BY WRITING ZEROS IN THE
* PATTERN NAME TABLE.  WHEN DEALING WITH THE LARGER MEMORY
* SPACE OF THE V9938, WE HAVE TO BE SURE THAT REGISTER #14
* IS CLEARED BEFORE WE START.  OTHERWISE WE MIGHT BY ZEROING
* OUT HIGHER AREAS OF MEMORY THAN WE WANT TO.
*
CLEAR LI    R0,>0E00      RESET OUR VDP ADDRESS
      BLWP  @VWWTR
      LI    R0,>0040
      MOVB  R0,@VDPWA
      SWPB  R0
      MOVB  R0,@VDPPA
      LI    R2,HEIGHT8   WE WILL WRITE 24,576 ZEROS
      CLR   R0
CLEAR1 MOVB  R0,@VDPWA
      DEC   R2
      JNE   CLEAR1
      RT


* RANDOM NUMBER GENERATOR
*
* THIS PROCEDURE RETURNS A (NOT SO) RANDOM NUMBER IN R1.
* IT ENSURES THE RANDOM NUMBER WILL NOT BE 0.
```

```
*
RAND    MOV    @SEED,R1
RAND1   AI     R1,>1D6B
        JEQ    RAND1
        MOV    R1,@SEED
        RT


SEED    DATA   >690A

DX1     DATA   0            THESE LOCATIONS ARE USED TO STORE
DX2     DATA   0            HOW FAR THE ENDPOINTS MOVE EACH
DY1     DATA   0            TIME A LINE IS DRAWN
DY2     DATA   0


* COLOR FLAG
*
* WHEN COLOR FLAG IS ZERO, THE LINES WILL APPEAR IN
* DIFFERENT COLORS.  WHEN IT IS NOT SET TO ZERO, ALL
* LINES WILL BR DRAWN IN THE SAME COLOR.  IT'S TOGGLED
* BY PRESSING THE 'C' WHILE LINES ARE BEING DRAWN.
*
CFLAG   DATA   0


* POINT
*
* POINT WILL TAKE AN X COORDINATE IN R0 AND A Y
* COORDINATE IN R1 AND A COLOR IN R2 AND PLOT THAT
* POINT ON THE SCREEN
*
POINT   SLA    R1,8         COMPUTE OFFSET IN PATTERN NAME TABLE
        A      R1,R0
        SRL    R0,1
        JOC    POINT1       SEE IF LEFT HAND OR RIGHT HAND
        LI     R3,>F000
        MOV    R2,R4
        SLA    R4,12
        JMP    POINT2
POINT1  LI     R3,>0F00
        MOV    R2,R4
        SLA    R4,8
POINT2  MOV    R0,R2
        ANDI   R0,>C000     WRITE UPPER 2 BITS OF ADDRESS
        SRL    R0,14        TO VDP REGISTER 14
        ORI    R0,>0E00
        BLWP   @VWTR
        MOV    R2,R0
        ANDI   R0,>3FFF
        BLWP   @VSBR        READ BYTE ALREADY THERE
        SZCB   R3,R1         CLEAR OUT OLD COLOR
        SOCB   R4,R1         PUT IN NEW COLOR
        BLWP   @VSBW        REWRITE OUT TO THE SCREEN
        RT


* PLOT
*
* THIS ROUTINE PLOTS A LINE FROM (X1,Y1) TO (X2,Y2)
* THESE COORDINATES ARE LOCATED IN THE CALLERS
* REGISTERS R6,R7,R8 AND R9.  THE COLOR IS
```

```
* SPECIFIED IN THE CALLER'S R10.
*
PLOT    DATA  >8300
        DATA  PLOT1

PLOT1   CLR   R12
        LI    R5,1
        LI    R6,1
        MOV   @16(R13),R7
        MOV   @12(R13),R9
        S     R9,R7
        JLT   PLOT11
        JMP   PLOT2
PLOT11  NEG   R7
        NEG   R5
PLOT2   MOV   R7,R7
        JNE   PLOT3
        SETO  R12
PLOT3   MOV   @18(R13),R8
        MOV   @14(R13),R10
        S     R10,R8
        JLT   PLOT4
        JMP   PLOT5
PLOT4   NEG   R6
        NEG   R8
PLOT5   MOV   R9,R0
        MOV   R10,R1
        MOV   @10(R13),R2 GET COLOR
        BL    @POINT
        C     R9,@16(R13)
        JNE   PLOT6
        C     R10,@18(R13)
        JNE   PLOT6
        RTWP

PLOT6   MOV   R12,R12
        JLT   PLOT7
        A     R5,R9
        S     R8,R12
        JMP   PLOT5
PLOT7   A     R6,R10
        A     R7,R12
        JMP   PLOT5

* MAIN PROGRAM
*
START   LWPI  >8320
        LI    R2,VDPREG     SET VDP REGISTERS
L1      MOV   *R2+,R0
        JLT   L2
        BLWP  @VWTR
        JMP   L1

        BL    @CLEAR        CLEAR THE SCREEN

        CLR   @CFLAG
        CLR   R3            R3 COUNTS THE NUMBER OF LINES WE HAVE DRAWN
```

```
        LI    R6,>80        SET THE ENDPOINTS FOR OUR FIRST LINE
        LI    R7,>60
        LI    R8,>D3
        LI    R9,>13

        CLR   R0            SET THE INITIAL AMOUNTS THE ENDPOINTS
        INCT  R0            MOVE BY
        MOV   R0,@DX1
        INCT  R0
        MOV   R0,@DY1
        INCT  R0
        MOV   R0,@DX2
        INCT  R0
        MOV   R0,@DY2

LOOP    MOV   @CLFAG,R0
        JNE   L5
        BL    @RAND         PICK A RANDOM COLOR
        ANDI  R1,>F
        MOV   R1,R5
        CI    R5,2          MAKE SURE WE DON'T HAVE BLACK
        JHE   L5
        ORI   R5,2
L5      A     @DX1,R6       MOVE THE ENDPOINTS
        A     @DY1,R7
        A     @DX2,R8
        A     @DY2,R9

* CHECK TO MAKE SURE THAT NO ENDPOINTS HAVE MOVED OFF
* THE SCREEN.  IF SO, REVERSE ITS DIRECTION.
*
        MOV   R6,R6
        JLT   L6
        CI    R6,>100
        JLT   L7
L6      NEG   @DX1
        A     @DX1,R6

L7      MOV   R8,R8
        JLT   L8
        CI    R8,>100
        JLT   L9
L8      NEG   @DX2
        A     @DX2,R8

L9      MOV   R7,R7
        JLT   L10
        CI    R7,HEIGHT
        JLT   L11
L10     NEG   @DY1
        A     @DY1,R7

L11     MOV   R9,R9
        JLT   L12
        CI    R9,HEIGHT
        JLT   L13
L12     NEG   @DY2
        A     @DY2,R9
```

```
L13     BLWP @PLOT
L14     CLR  R0              CHECK TO SEE IF A KEY IS PRESSED
        MOVB R0,@>8374
        BLWP @KSCAN
        MOVB @>8375,R0
        MOVB @>837C,R1
        JEQ  L16
        CI   R0,>0500        CHECK FOR QUIT KEY
        JNE  L15
        B    @QUIT
L15     CI   R0,>4300        CHECK FOR "C" KEY PRESSED
        JNE  L14
        INV  @CFLAG          TOGGLE THE COLOR FLAG
L16     CI   R0,>FF00
        JNE  L14
        INC  R3
        CI   R3,NUMLIN       SEE IF WE HAVE MORE LINES TO DRAW
        JNE  LOOP            IF SO, GO BACK AND DRAW THEM

        CLR  R3
        LI   R2,10
        LI   R4,>FFFF
DLY     DEC  R4              WAIT A LITTLE BEFORE CLEARING THE SCREEN
        JNE  DLY
        DEC  R2
        JNE  DLY

        BL   @RAND           COMPUTE NEW RANDOM MOVEMENTS
        MOV  R1,R1
        JLT  L17
        ANDI R1,7
        JMP  L18
L17     ORI  R1,>FFF8
L18     MOV  R1,@DX2
        BL   @RAND
        MOV  R1,R1
        JLT  L19
        ANDI R1,7
        JMP  L20
L19     ORI  R1,>FFF8
L20     MOV  R1,@DY1
        BL   @RAND
        MOV  R1,R1
        JLT  L21
        ANDI R1,7
        JMP  L22
L21     ORI  R1,>FFF8
L22     MOV  R1,@DX1
        BL   @RAND
        MOV  R1,R1
        JLT  L23
        ANDI R1,7
        JMP  L24
L23     ORI  R1,>FFF8
L24     MOV  R1,@DY2

        BL   @CLEAR          CLEAR SCREEN
```

8

```
        B     @LOOP        START OVER

QUIT    LI    R2,REG2        RESTORE VDP REGISTERS BACK TO NORMAL
QUIT1   MOV   *R2+,R0
        JLT   QUIT2
        BLWP  @VWTR
        JMP   QUIT1
QUIT2
        LIMI  2
        BLWP  @0

* VDP REGISTERS TO SET VDP TO GRAPHICS 4 MODE
*
VDPREG  DATA  >0006
        DATA  >0160
        DATA  >021F        LOCATE NAME TABLE AT ADDRESS 0
        DATA  >0711        SET BACKGROUND TO BLACK
        DATA  >080A        INHIBIT SPRITES
        DATA  >0980        212 LINES
        DATA  >FFFF

* VDP REGISTERS WHEN WE EXIT
*
REG2    DATA  >0000
        DATA  >0F00
        DATA  >01F0
        DATA  >0200
        DATA  >03FF
        DATA  >0401
        DATA  >0560
        DATA  >0E00
        DATA  >FFFF

        END   START
```

NEXT MEETING: Tuesday

July   13, 1993 6:30 PM

WEST MUSIC, COLLINS ROAD
PLAZA,   MARION
ACROSS FROM LINDALE MALL

Cedar Valley 99'er Users Group
c/o Jim Green
377 Cambridge Dr. NE
Cedar Rapids, Iowa 52402-1446

FIRST CLASS

Send To:

GARY BISHOP
124-222
3270 28TH AVE
MARION, IA 52302