VBUG V1.1 OPERATING SYSTEM MONITOR

CONTROL CODES

Code	Function
$0C	CLEAR SCREEN - Cursor HOME
$01	CURSOR HOME - Screen Secure
$1A	Cursor UP
$0A	Cursor DOWN
$08	Cursor LEFT
$09	Cursor RIGHT
$0D	CARRIAGE RETURN - Auto Line Feed
$0E	Reverse Video ON
$0F	Reverse Video OFF
$7F	DELETE
$20-$7E	ASCII Character Set
$A0	Sets Super-Script Mode
$A1	Sets Sub-Script Mode
$1C	SET point X,Y
$1D	CLEAR point X,Y
$18	TEST point X,Y
$15	INVERT point X,Y
$1E	DRAW line to X,Y
$19	UNDRAW line to X,Y
$17	INVERT line to X,Y
$1F	MOVE graphics 'Pen' to X,Y
ESC [PN = 0 b	Set NON-Blinking Cursor
ESC [PN = 1 b	Set BLINKING Cursor
ESC [PN w	Set Character WIDTH 1 - 5
ESC [PN = 0 u	Underlining OFF - Automatic
ESC [PN = 1 u	Underlining ON - Automatic
** ESC [PN = 40 s	Set 40 Column Mode
ESC [PN = 80 s	Set 80 Column Mode
ESC [PN1;PN2 r	Set Scrolling Window to parameters
ESC [PN1;PN2 c	Move Cursor to parameter position

** Now redundant - see Addendum

```
500 REM THIS SUBROUTINE SENDS A STRING
510 REM X$ to Video Module
520 IF LEN(X$)=0 THEN RETURN
530 REM IGNORE EMPTY STRING
540 FOR I9 = 1 TO LEN(X$)
550 REM DO EACH CHARACTER IN TURN
560 DT=ASC(MID$(X$,I9,1)):GOSUB 10
570 NEXT
580 RETURN

1000 REM START OF MAIN PROGRAM
1010 ST=11*4096+14*256:CT=ST+1
1020 REM SET UP VIDEO MODULE ADDRESSES

ETC - ETC -
```

The variables ST,CT,XL,XH,YL,YH and I9 are reserved for use by these subroutines and therefore should not be used elsewhere in a program. Variables DT,X,Y,X$ are used to pass parameters to these routines and should be set appropriately before any GOSUB.

Example 1.

Clear the Video screen and write the message 'HI THERE' in the middle of the screen in double width characters.

```
2000 DT=12:GOSUB 10
2010 REM SENDS CLEAR SCREEN COMMAND
2020 X$=CHR$(27)+"[2w"
2030 REM CHR$(27)=ESCAPE - X$=ESCAPE SEQUENCE TO SELECT DOUBLE
     WIDTH CHARACTERS
2040 GOSUB 500: REM SEND ESCAPE SEQUENCE
2050 X$=CHR$(27)+"[12;15c"
2060 REM SET X$=ESCAPE SEQUENCE TO MOVE TO ROW 12, COLUMN 15
2070 REM REMEBERING THAT COLUMNS ARE NOW 0 - 39 IN DOUBLE WIDTH
     MODE
2080 GOSUB 500:REM MOVE CURSOR
2090 X$="HI-THERE"
2100 GOSUB 500:REM PRINT MESSAGE
2110 END
```

It can be seen before these examples that the Video module would like a permanent link into the host computers operating system if it is to be used on a full time basis and/or if the user prefers it capabilities beyond that which is currently available on the Microtan system. If the user so decides to use the Video module as part of his mainline system then modifications may be employed safely with the knowledge that any modifications required to drive the Video module are in the software rather than the hardware field. With that it only remains me to remind you that experimentation on what routines are best suited for a complex allround performance of harmony between the Video module and the host computer is that of 'Hands On & User time'.

Continue overleaf - Basic example 2.

BASIC - Example 2.

Draw diagonal lines from each corner of the Video screen to the opposite corners.

```
2000 DT=12:GOSUB 10:REM CLEAR SCREEN
2010 MV=31:REM VALUE OF MOVE GRAPHICS CURSOR COMMAND ($1F)
2020 DR=30:REM VALUE OF 'DRAW LINE' COMMAND ($1E)
2030 X=0:Y=0:REM PEN POSITION
2040 DT=MV:GOSUB 10:REM SEND MOVE COMMAND
2050 GOSUB 100:REM SEND PARAMETERS
2060 X=511:Y=255:REM TOP RIGHT HAND CORNER
2070 DT=DR:GOSUB 10:REM DRAW COMMAND
2080 GOSUB 100:REM DRAW LINE
2090 X=511:Y=0:REM BOTTOM RIGHT
2100 DT=MV:GOSUB 10
2110 GOSUB 100:REM MOVE TO BOTTOM RIGHT
2120 X=0:Y=255:REM TOP LEFT
2130 DT=DR:GOSUB 10
2140 GOSUB 100:REM DRAW LINE
2150 END
```

Basic by its very nature is a slow medium to use with a module of this capability,
Machine Code or Forth must hold the answer for fast efficient graphic plotting,
bearing in mind that it is not the speed of the actual plotting taking place that is
slowest, it is the actual speed at which parameters are formulated by the host system.
Over the next few months there is no doubt we shall see a lot of the Video Module in
these pages. This article has 'Talked' through a few of the facilities of the module,
ideas and applications abound. Before going on with other details of the Video Module
I'll leave this section and you with a passing thought. What happens when we start
using this module as a single board companion computer rather than a Video
terminal!?.

HARDWARE COMPATABILITY

Hardware compatability is not a problem in fact the case does not arise, the module
is an independent entity which only requires access to the system bus via an additional
socket on the mother board, power supply is the standard +5 volts and the module
draws aprox 1/2 Ampere. Components used on the module are standard TTL's which
are available almost anywhere, the circuit is so designed that these components are
running well within their tolerance levels and in some cases well below, so no
problems are expected from overheating i.c's or from problems with components being
slightly under specifications. There is nothing more to say on this matter.

One interesting application has been undertaken by one of our members already which
may prove exciting for the 'Old Grey Matter' and that is using three Video modules
each to drive each colour gun on an R.G.B. monitor, with a small interface circuit to
derive the necessary sync pulses etc. The mind boggles at the enormous power this
would unleash on a colour display - three 'Computerised 'Intelligent' colour guns!!
Needless to say how much you would have to pay for a comparable system on today's
market.
But there you are, that's one application being brought in force at this early stage, no
doubt there will be others, we'll keep you posted.

VIDEO 80/82 MANUALS NOW AVAILABLE - £3.50 + 25 pence P.&P.
Refundable on purchase.

VIDEO 80/82 BUS CONNECTIONS

HOST SYSTEM

	b		a	
HOST SYSTEM SUPPLY	+5v	1	+5v	HOST SYSTEM SUPPLY
6MHz CLOCK	CLK	2		
		3		
HOST SYSTEM RESET	RST	4	T/O	
ADDRESS BUS	A1	5	A0	ADDRESS BUS
" "	A3	6	A2	" "
" "	A5	7	A4	" "
" "	A7	8	A6	" "
" "	A9	9	A8	" "
		10		
		11		
		12		
		13	IRQ	INTERRUPT REQUEST
		14	NMI	NON-MASKABLE INTERRUPT
		15		
		16		
FIELD BLANKING	FB	17	R/W	READ NOT WRITE
		18	HB	HORIZONTAL BLANKING
		19	DB0	BUFFERED DATA BUS
VIDEO OUT TO HOST	VIDEO	20	DB1	" " "
		21	DB2	" " "
		22	DB3	" " "
		23	DB4	" " "
		24	DB5	" " "
		25	DB6	" " "
		26	DB7	" " "
		27		
		28		
		29		
		30		
		31		
EARTH RETURN	0v	32	0v	EARTH RETURN