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APRIL-MAY AND JUNE 1993 NEWSLETTER

TI SLAVES

OUR NEXT MEETING IS JUNE 19TH. 1993 AT 1:pm

WE WILL MEET AT JOE MASARONES HOUSE FOR OUR GROUP PICK-NICK

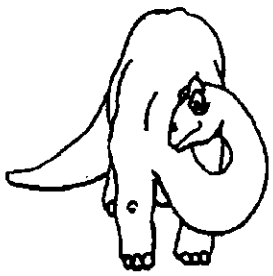
IT IS POT LUCK

HOPE TO SEE EVERYONE THERE....

OGDEN TI USERS GROUP

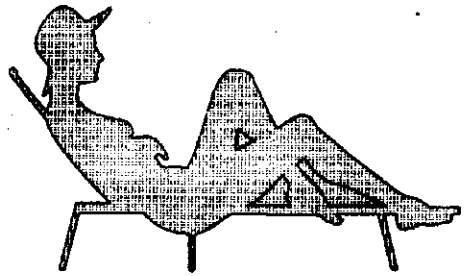
OUR NEXT MEETING IS JUNE 5TH AT 9 AM AND JUNE 22ND AT 7 PM. WE MEET AT THE OGDEN MUNICIPAL AIRPORT IN THE FIRST BUILDING JUST EAST OF THE NEW TOWER.

SLAVES AND OTUG
1396 LINCOLN APT.B
OGDEN, UTAH 84404



OTUG AND SLAVES

APRIL- MAY AND JUNE 1993 NEWSLETTER



Happy Mothers Day!

How Fast Is the TI-99/4A?

by Steve Richardson
SLAVE User's Group

The Texas Instruments 99/4A home computer is in many ways a remarkable machine. You will recall it was introduced in 1979 to a world that had no idea of what a home computer would be asked to do. At that time computers were used by universities to keep track of your grade point average, and by governments to devise new ways to get their hands on more of your tax dollars. Banks were using them to bill you for overdrafts on your checking account. The computer at *Reader's Digest* was constantly sending us personalized letters informing us that we'd won one of three items: a dream vacation, a new car, or a mystery prize. It cost you more money to discover that you'd won the mystery prize than the mystery prize was worth. None of these applications seemed to fit well at home, and few of our contacts with computers were happy ones.

If not by the advertising hype of those days, you and I were probably lured into bringing a computer into our homes for the games. Which computer to bring home was a decision that even Solomon would have struggled with. There were millions who made the wrong choice, but you and I got a TI. What else could you have bought that you would still be using 10 years later? If you think IBM, you're probably wrong! It'd be broke by now.

Whenever we turn our systems on and push a command module into the slot, we are immediately confronted with two choices. The game is number 2. Number 1 is TI BASIC. I don't know about you, but for me it was intriguing to ponder what could happen if I only knew enough about programming to have the computer leaping at my command.

Those two books that came with the computer gave me that opportunity, and though it complained more than it leaped, I was soon hooked on giving the computer steadily more complex instructions, and then watching to see it obey them, even stupid instructions. Since Texas Instruments had built its reputation on calculators, and since the machine was designed to showcase the TMS 9900 16-bit microprocessor, TI placed a high priority on mathematical precision. The 99/4A was also designed to be a learning device. We were beginners, and as such we were spared from having to make the decision of how precise we wanted our numbers to be. Your TI always gives the best and most perfect answer it can. Try out the following BASIC command on your computer:

```
FOR I=.1 TO 10 STEP .1::PRINT 1/100::NEXT I
```

If you are using your 99/4A you are also looking at the right answers, meaning the same answer you would get if you were to work it out with pencil and paper (you may recall that this process involves shifting the location of the decimal point). If you used an IBM compatible, however, the answers appear to be right only some of the time. Of course there are programming techniques that you could use to trick the computer into making the answers seem correct, but these additional activities quickly transform a user friendly environment into a hostile one.

A common complaint is that the TI is too slow. Well, if your TI could talk.... It can? Then let me rephrase that. If it could complain, it would successfully argue that it's slow because of the sloppy programs we write for it. Our programs would run much faster if we would use multiple-command program lines, keep a list of variables for prescan, use short variable names, condense the program size, and reduce the use of slow functions. That last step is possible only if you know how fast each operation is.

In the early days of computing there was a breed of computer specialist called programmer-analysts. They may still exist in some form. Anyway, their job was to speed the computations up by testing with a stopwatch to see how long each operation took. Of course your TI would be done performing a task before you flicked the button on your stopwatch once, but if we had it do the same thing a thousand times, then we could know how long the operation takes by dividing by a thousand. This is the intent of the first program on the accompanying page. Of course, it gets tedious waiting for the signal with your thumb on the stopwatch, so the second program was written to automate the process. I have Millers Graphics Super Extended BASIC, which has wonderful features not available on regular TI Extended BASIC. Since you probably can't buy this module anymore, I won't try to sell you on the concept. However, program 2 uses CALL CLOCK to put a clock on the screen, CALL PEEKV to read the numbers from the screen, CALL POKEV to print the numbers elsewhere on the screen, and CALL CHIMES to let us know when it's done. This allows me to load line 100 with a function, for instance A=VAL(A$), direct my attention to something else, and when the chimes sound I can copy the answer off the screen. Some operations, (mostly trig functions) slowed down the clock to a third of its normal pace, so these were timed with a stopwatch.

```
10 ! **********************
     *BENCHMARKER Program 1*
   **********************
20 !by S.Richardson, 3/12/93
30 !open #1:"DSK1.X"
!Use this for EOF, REC, etc.
40 A=PI :: C=1 :: A$="012345
6789ABCDEF" :: C$=STR$(A)!
 Test Variables
50 Q=1000 !Number of cycles.
60 J=.004 !FOR/NEXT overhead
70 CALL SOUND(1,990,0,110,0,
550,0)
80 !
90 FOR I=1 TO Q
100 !Test Function Here.
110 NEXT I
120 !
130 CALL SOUND(1,770,0,990,0
,110,0)!! FOR I=1 TO 99 :: N
EXT I :: INPUT "How Long (mm
:ss)? ":P$ :: M=POS(P$,":",1
)!! IF M=0 THEN P=VAL(P$)!!
GOTO 150
140 P=VAL(SEG$(P$,1,M-1))*60
+VAL(SEG$(P$,M+1,LEN(P$)))
140 PRINT P/Q-J;"seconds."
150 STOP
```

```
10 ! **********************
     *BENCHMARKER Program 2*
   **********************
20 !by S.Richardson, 3/12/93
30 !open #1:"DSK1.X"
!Use this for EOF, REC, etc.
40 A=PI :: C=1 :: A$="012345
6789ABCDEF" :: C$=STR$(A)!
 Test Variables
50 Q=1000 !Number of cycles.
60 J=.006 !FOR/NEXT overhead
70 CALL HCHAR(1,1,32,64):: C
ALL SOUND(1,990,0,110,0,550,
0)!! CALL CLOCK
80 !
90 FOR I=1 TO Q
100 ! Test Function Here.
110 NEXT I
120 !
130 CALL PEEKV(23,B,C,D,E,F,
G,H,X):: CALL POKEV(759,B,C,
D,E,F,G,H,X):: B=B-96 :: C=C
-96 :: E=E-96 :: F=F-96 :: G
=G-96 :: H=H-96 :: X=X-96
140 L=VAL(CHR$(B))*10+VAL(CH
R$(C)):: M=VAL(CHR$(E))*10+V
AL(CHR$(F)):: N=VAL(CHR$(G))
*10+VAL(CHR$(H))
150 P=L*3600+M*60+N :: DISPL
AY AT(23,24):P/Q-J :: CALL H
CHAR(23,31,115,1):: CALL CHI
MES :: CALL CLKOFF :: STOP
```

Speed of TI Extended Basic Operations (in seconds)

100 REM	.001
100 !	.001
100 REM ABCDEFGHIJKLMNOPQRST UVWXYZ0123456789abcdefghijkl mnopqrstuvwxyz0123456789ABCD EFGHIJKLMNOPQRSTUVWXYZ	.001
100 ! ABCDEFGHIJKLMNOPQRSTUV WXYZ0123456789abcdefghijklmn opqrstuvwxyz0123456789ABCDEF GHIJKLMNOPQRSTUVWXYZ	.001
100 B=A*C	.013
100 B=A/C	.016
100 B=A+C	.012
100 B=A-C	.012
100 B=A^C	.017
100 B=ABS(A)	.008
100 B=ASC(A$)	.010
100 B=ATN(A)	.100*
100 B=COS(A)	.043*
100 A=EOF(1)	.049
100 B=EXP(C)	.084
100 B=INT(A)	.008
100 B=LEN(A$)	.009
100 B=LOG(A)	.121*
100 B=MAX(A,C)	.017
100 B=MIN(A,C)	.018
100 B=PI	.006
100 B=POS(A$,"Y",1)	.094
100 B=REC(1)	.014
100 B=RND	.073
100 B=TAN(A)	.063*
100 B=VAL(C$)	.071
100 B=SGN(A)	.007
100 B=SIN(A)	.025*
100 B=SQR(A)	.080*
100 A$=CHR$(A)	.017
100 A$=RPT$("A",1)	.021
100 B$=SEG$(A$,1,1)	.029
100 B$=STR$(A)	.023
100 C$=A$	.009
100 C$=A$(1)	.011
100 C$=A$(1,1)	.014
100 READ A	.029
100 READ A$	.024
100 CALL CHAR(33,A$)	.090
100 CALL PEEK(-31868,A)	.021
100 CALL LOAD(-31868,161)	.017
100 CALL PEEKV(1,A) (SAM)	.020
100 CALL PEEKV(1,A) (SAM)	.020
100 CALL POKEV(1,161) (SAM)	.016
100 CALL POKEV(I,161) (SAM)	.018
100 CALL SCHAR(1,3,65,10)	.039
100 CALL BCHAR(1,3,65,10)	.033
100 CALL VCHAR(1,3,65)	.019
100 CALL VCHAR(1,3,65,10)	.039
100 CALL GCHAR(3,3,A)	.022
100 CALL GCHAR(24,28,A)	.022
100 CALL INIT	.108*

100 CALL KEY(0,K,S) .026
100 CALL CLEAR .019
100 DISPLAY .076
100 PRINT .075
100 GOTO 110 .001
100 GOSUB 160 .002
100 RESTORE .150
100 DISPLAY AT(2,1):1 .058
100 DISPLAY AT(2,1):A$ .049
100 DISPLAY AT(2,1):A .062
100 DISPLAY AT(2,1):C$ .049
100 IF A=C THEN 130 .008
100 IF A$=C$ THEN 130 .007
100 IF A$<>C$ THEN 130 .007
100 IF A<>A THEN 130 .009
100 IF (A=1)+(C=1) THEN 130 .013
100 IF A=1 OR C=1 THEN 130 .013
100 IF (A=1)*(C=1) THEN 130 .013
100 IF A=1 AND C=1 THEN 130 .013
100 IF A=C THEN 130 ELSE 110 .009
100 IF C$=A$ THEN 130 .007
100 IF C$=A$(1) THEN 130 .009
100 IF C$<>A$(1) THEN STOP .012
100 IF A$(1)<>A$(1) THEN STOP .014
100 IF A$(1)<>A$(1) OR A$(1) <>A$(1) THEN STOP .017
100 IF A$(1)<>A$(1) AND A$(1)<>A$(1) THEN STOP .017
100 DATA 1,2,3,4,5,6,7,8,9,1 0,11,12,13,14,15,16,17,18,19 ,20,21,22,23,24,25,26,27,28, 29,30,31,32,33,34,35,36,37 .001
100 CALL A
160 SUB A::SUBEND .006
100 FOR C=1 TO 1::NEXT C .016
100 FOR C=1 TO 2::NEXT C .022
100 FOR X=1 TO 2::NEXT X .020
100 FOR X=1 TO 2
105 NEXT X .021
100 FOR X=1 TO 20::NEXT X .111
100 FOR X=1 TO 20
105 NEXT X .118
100 FOR X=1 TO 40 STEP 2::NE XT X .112
100 FOR X=1 TO 40 STEP 2
105 NEXT X .119

* = timed with stopwatch

OUR ROMANIAN FRIEND

by Harold Hilburn

I recently responded to a letter I had received from a TI user in Bucharest, Romania. I have just received the reply to that letter, and will include it as accurately as possible so that you can share in this new friend. It is from Marin Stanculescu and explains his system, his desires and some personal information in response to my letter and attachments I had sent him. I had called him "Stan" since his first letter indicated his name to be "Stanculescu Marin". Now I know!!!

"Dear Harold and Family,

I hope you don't mind if I call you Harold. I was very pleased to receive your letter and I thank you very much. I know your name and address from one ad.^an FEST WEST, NORTH 83. I am interested in all sorts of TI programs, especially the educational ones, for my 8 years old child, Radu. Also, I need one 32K memory single chip to install into the console, if it is not too costly to handle. I know I shouldn't be asking but I'm really interested in expanding my TI memory, and I didn't find anything for TI 99/4A in Romania. Since I have a console, Extended Basic and a way to save my work (cassette recorder) I start to write my own programs. The TI manuals are pretty good but I still need support, in fact that is why I bought my computer, so I could program. That is the main thing I wish to do with it, other than educate my child and more than anything else, word processing. Also I have a printer, TV colour set and Mini-memory Command Module, Speech Synthesizer and Joysticks. My first name is Marin. I am 36 years old, happily married, with one boy, Radu, aged 8. I finished education with the Economic Institute, Section Tourism and I am working at Department of Labour. We have a few things in common, that is except for age. I like to read about your trips. I can't afford to visit the USA but perhaps some day you can visit Romania. I would like to meet you. We have a beautiful country. I have also one house at 250KM from Bucarest in one beautiful place. Even if you don't have the possibility to help me with my TI, I should like to keep writing with you and I shall appreciate any advice you can render me. Apart from TI, my chief interests are science fiction literature and swimming. I also collect stamps. I am looking very much to hearing from you. ^^^^ Please write soon. Your Romanian friend, (Signature unreadable) P.S. My apologies for the bad English."

I don't know about the rest of you, but I think his English is outstanding. His whole letter is completely understandable and I think the few slight differences in grammar and word use are refreshing. Well, can any of you Tiers think of ways we can help him?^ I think he needs a PE Box with at least a single drive, RS232 for his printer and memory. I'll get a letter back to him asking if he needs any of the modules on the listing from Competition Computer Solutions I had sent him, that we might round up for him, what make and model of printer he has and also see how he could pay for the PE System (I think I can get one for about $100) and shipping. Please leave me a message on the SFBBS (#6), a phone call to 773-0622 or at the User Group meetings regarding your thoughts of things we can do to help Marin.

HERE IS A FIX FOR DSKU

to boot Funnelweb

This item was written by Charles Good, of the Lima Group.

DSKU V4.2 was distributed by the Lima User Group with Funnelweb V4.4 and the earlier V4.31. There is an item on the main DSKU menu that says "LOAD FW.: It usually doesn't work. The reason is that DSKU searches the drive you specify for a file named UTIL1, which is what the main Funnelweb file is now called FW.

It is easy to modify to boot FW every time you ask DSKU to "Load FW." Here's how:

Use Funnelweb's Disk Review or other sector editor to search for the third DSKU file(named either DW or DSKW) for the ASCII text "UTIL1." You will find "DSK1.UTIL1." Change UTIL1 to "FW" and put blank spaces over the "IL1." Then changethe screen display to hex(CTRL-W and then CTRL-A if you are using Disk Review). This change shortens the length of the text the computer expects to find since DSK1.FW is shorter than DSK1.UTIL1. DSKU will now properly boot FW from DSKU's main menu.

NEVER RELEASED OFFICIAL TI PERIPHERALS: THE HEXBUS INTERFACE;

A KEY TO WHAT MIGHT HAVE BEEN

A hands on description by

Charles Good Lima Ohio User Group

The Hexbus interface (PHP1900) allows you to control all the neat little hexbus peripherals directly from the 99/4A console. With this interface and a side car 32K (or 32k installed inside the console) you can create a fully expanded system with a very small footprint (occupying little surface area). If you paid full list 1983 TI prices, the cost of your expanded system would be much less than an expanded system based on the peripheral expansion box.

If you have a box that contained a beige console you can see what a TI Hexbus interface looks like. There is a picture of one on the bottom of the box attached to the side of a console. TI listed this device in its last price list (dated June 1, 1983) for $69.95, but it Has never officially released. Only a handful of original TI hexbus interfaces are known to exist. I have such a 1983 TI hexbus interface on loan from Gary Taylor for this report, and I now also have my very own BRAND NEW cloned hexbus interface. For years people have been trying to clone TI's original interface and now it has been done. As of right now I am one of two people to own one of these cloned interfaces. More on this later.

Gary's official TI interface measures 8 x 3.5 x 2.25 inches. It connects to the side of the console and has a connection on its right side for other standard 99/4A peripherals or the peripheral expansion box cable. On the back is an on/off switch, a power supply jack for the required model AC9201 9v 900ma external power supply, and one hexbus connector. There is no serial number or date code (ATA or LTA number) on Gary's interface, indicating that it is a preproduction prototype. There is, however, an FCC identification number (ABSJWPHP1900), and a statement that the device has been approved by the FCC for "class B" use in the home.

The following hexbus peripherals have been tested by me using a 99/4A console and the hexbus interface with no problems. These are all very small peripherals, and all of them except the RS232 can be run on batteries as well as AC current. With the exception of the Printer 80 they all stack neatly on top of each other. You can place the whole stack of peripherals on top of the hexbus interface where it is connected to the side of the console. The entire footprint of all these peripherals when stacked on top of the interface OCCUPIES LESS TABLE SPACE than the hexbus PE Box connector when connected to the console. The PE Box connector sticks out further from the right side of the console than does the hexbus interface and stack of hex bus peripherals! --Hexbus RS232 with parallel option: can be used to run any printer. --Hexbus modem, doesn't require an RS232, 300 baud. --Wafertape drive. This is a "never released peripheral" that I own. Up to 8 of these can be cabled together in a single system. --Hexbus 4 color printer/plotter. This tiny printer can be addressed directly and does not need an RS232. --The Hexbus 'Printer 80' 80 column thermal printer also works flawlessly with the hexbus interface, but you can't stack it with the other peripherals. Like the printer/plotter, the Printer 80 can be addressed directly and doesn't require an RS232 interface. It uses fax paper or plain paper and a thermal ribbon cartridge.

TI was developing a hexbus 5.25 inch floppy drive controller. I know of two working examples of this controller in private hands, and one of these has been tested successfully with a 99/4A hexbus interface.

Unfortunately, the Hexbus interface does not work properly with the Mechatronic quickdisk drive, the

one that uses 2.8 inch disks. You can save programs to quickdisk, but you can't load them back off the disk into the 99/4A.

WHAT YOU CAN D WITH THE HEXBUS INTERFACE:

According to TI's documentation that comes with the TI interface, the device can be addressed in TI BASIC, TI EXTENDED BASIC, Assembly language, and from the P-code peripheral. The usual syntax is "HEXUS.DEVICE_NUMBER.FILE_NAME". For example, to save a BASIC program to a wafertape set up as device 2 (wafertape drives can be designated any number from 1-8) you would type SAVE HEXBUS.2.PROGRAM and press <enter>. To list a basic program to a printer attached to the hexbus RS232 you would enter LIST "HEXBUS.80." Where device 80 is the parallel output of the RS232. To list a program to the printer plotter the syntax is LIST "HEXBUS"10."

I have used the interface with WORDWRITER, a cartridge version of TI Writer. LF and then the file name HEXBUS.2.TEXTFILE will load TEXTFILE into the edit buffer from wafertape device 2. PF and then HEXBUS.16. will print the file directly to the Printer 80 (which is device 16).

The TI Hexbus interface user guide was never officially published. It would have been designated as document 1049000-1, and was last revised sometime after March 1, 1983. (I have the March 1 revision. Errors in this revision have been corrected in my copy of 104900-1.) This user guide

suggests that you can get a CC40 and 99/4A to talk to each other over the hexbus interface, allowing the CC40 to store data on the 99/4A's drives and display information on the 99/4A monitor. There is only limited truth to this. The documentation includes a skeleton 99/4A BASIC program that is supposed to put the /4A in "slave mode" so that it and its peripherals can can be controlled by a CC40 connected to the hexbus interface. The key word here is "skeleton". Big parts are left out of this BASIC program, and nobody that I know who has a TI hexbus interface can make this program work. Nobody has been able to SAVE or OLD a CC40 program onto a 99/4A floppy drive or display CC40 text via a 99/4A onto a monitor. You are supposed to be able to do this, but nobody can figure out how.

You can use a CC40 (or TI74) to save data to a data file on wafertape and then use the 99/4A to open the file and send the data into the 99/4A. Wafertape drives are rare and not very reliable. It is really too bad that you can't use the Mechatronic quickdisk drive with the hexbus interface.

THE KEY TO WHAT MIGHT HAVE BEEN: Back in 1983 the hexbus interface would have been the key to a low cost compact expanded 99/4A system. Lets compare costs, based a the ridiculus full list prices from TI's last official price list. EXPANSION VIA THE PE BOX: --PHP1200 Peripheral Expansion box.....$349.95 --PHP1220 RS232 Card.....$174.95 --PHP1240 Disk Controller Card.....$349.95 --PHP1250 Floppy drive for PE box.....$399.95 --PHP1260 32K card.....$299.95 --PHP1280 Telephone coupler (modem).....$199.95 ----------TOTAL EXPANSION COST..$1674.70

EXPANSION WITH HEXBUS PERIPHERALS: --You need a side car 32K and there is no such hexbus product. Doryt Systems advertises one in the June 1983 99er.....$175.00 --PHP1200 Hexbus Interface.....$ 59.95 --HX9000 Wafertape Drive.....$139.95 --HX3000P RS232 with parallel interface.....$124.95 --HX3100 Hexbus modem.....$ 99.95 ----------TOTAL EXPANSION COST....$598.80 This would leave you with enough extra money to purchase additional hexbus peripherals such as --Additional Wafertape drives. Up to 8 drives can be cabled to gether in one system and you don't need any kind of "controller" interface. --HX1600 4 color printer/plotter.....$199.95 --HX1610 Printer 80, released in 1983 at.....$349.95 (the TI impact printer listed in 1983 for $750.)

So after listing it in their official price list, obtaining FCC certification, and providing a color picture of the thing on each beige console box, why didn't TI offer the Hexbus interface to 99/4A users? I suspect the answer is the failure of the wafertape drive to live up to expectations. My wafertape drive, and those owned by A few other lucky collectors, are not very reliable, particularly when operated on battery power. The key to system expansion is reliable mass storage that is better than a cassette tape recorder. Failure of the wafertape drive left the hexbus in 1983 with no mass storage peripheral. But this may soon change!

NEW 1993 HEXBUS PERIPHERALS: reported by Charles good Lima Ohio User group A hobbyist in Germany named Michael Becker is making clones of TI's never released Hexbus peripherals in limited quantities. (Michael Becker also makes a quad density disk controller and a "speech in the PE box" card that includes TEXT speech in Rom usable from extended basic without occupying normal XB program memory space. This card was shown at the Feb 1993 Fest West.) --99/4A hexbus interface. I own one of these clones. It is built like a tank in a solid metal enclosure resembling the enclosure of the Mechatronic 80 column peripheral. Like the original TI product, the clone plugs into the side of the console and has a connector for the PE Box cable. Unlike the TI original my clone has an LED which flickers to tell me that my interface is functioning, and it does not require a separate power supply. --5.25 inch DSDD hexbus disk controller. This can be used for mass storage with the CC40, TI74, 99/2, 99/3, and with the hexbus interface can also be used with the 99/4A. Michael Becker has a TI original (a very very rare device, even rarer than a wafertape drive) and has dumped all the code in the PAL chips so that he can produce duplicates. I expect delivery of my controller in a few months. --Hexbus Video interface.This allows the CC40 and TI74 to display text in 40 columns on a composite color monitor. One of my correspondants has seen Michael's working prototype. It is better than the TI original in that it will display in 16 colors, not just in black and white.

Another hobbyist' Lee Bondick, has cloned the CC40 EA cartridge and is making this cartridge available to interested CC40 owners. This allows users to program the CC40 in assembly language, storing assembly routines in battery backed RAM cartridges or in the RAM of the CC40. I know of only 4 TI original CC40 EA cartridges. I own one of Lee's cloned EA cartridges and it works as described in my two massive CC40 assembly language manuals. You need either a 5.25 hexbus disk drive or a wafertape drive to make the EA cartridge work.

Anyone interested in any of these CC40/Hexbus peripherals can write me at P.O. Box 647, Venedocia OH 45894. I will put you in touch with Michael Becker or Lee Bondick.

PC99 Functional Specification v930301

Purpose.

To develop a software emulation of the Texas Instruments TI-99/4A Home Computer and selected peripherals running on an IBM (or compatible) Personal Computer (PC).

PC Requirements.

The PC must have the following hardware:

- 80286 or higher microprocessor
  (80386 at 33MHz is minimum recommended).
- at least 640K RAM, of which 540K must be available.
- color VGA adapter and monitor.
- diskette drive to load software
  3.5" 720K, 3.5" 1.44Mb, 5.25" 360K, or 5.25" 1.2Mb.
- a 20Mb or larger hard disk drive.

The PC must have the following software:

- DOS 5.0 (or later). Earlier versions of DOS will probably work.

Description of product.

The product will be known as PC99. It consists of the following modules:

- PC99.EXE
  The TI-99/4A emulator
- CONFIG99.EXE
  A utility that allows you to configure PC99.
- COLOR99.EXE
  A utility to inspect or change the colors used by PC99.

All of these programs run under DOS. They are executed by typing the program name at the DOS prompt.

Delivery media.

PC99 can be delivered on 3.5" 720K, 3.5" 1.44Mb, 5.25" 360K or 5.25" 1.2Mb. The media is specified at time of order.

Emulation requirements

PC99 must emulate in software the Texas Instruments TI-99/4A computer. This requires emulation of the TMS9900 16-bit microprocessor, the TMS9918A video display processor (VDP), the TMS9901 programmable systems interface, the partly decoded addressing scheme between >8000 and >9FFF, TI RAM and TI ROM, TI GROM, and TI I/O devices.

- TMS9900 16-bit processor
  PC99 must emulate all 69 instructions that can be executed by the processor. PC99 maintains a software workspace pointer, instruction counter and status register. PC99 will fetch the instruction pointed to by the instruction counter, and then emulate the action of the 9900 processor in processing that instruction.

- TMS9918A video display processor (VDP)
  PC99 must emulate: the four video modes (graphics, text, multicolor and bitmap); the 8 VDP write-only registers; and up to 32 sprites, that can have auto-motion. PC99 maintains a 16K block of memory that represents TI VDP RAM. The output of the emulated VDP is displayed on the PC screen in 320 by 200 by 16-color mode. This mode requires a PC VGA adapter and monitor, or better.

- TMS9901 programmable systems interface
  In the 99/4A, the TMS9901 communicates with the 9900 through the Communication Register Unit (CRU). PC99 maintains a block of memory that represents up to 4096 CRU bits. One of the prime tasks of the 9901 is to handle the keyboard. PC99 must detect a PC key being pressed, look up the corresponding TI CRU lines, and set them accordingly. Applications software (such as the 99/4A console KSCAN) will then react to the emulated CRU lines.

- Partly decoded addressing scheme between >8000 and >9FFF
  PC99 must emulate the 256 bytes of processor RAM that is normally at >8300 through >83FF. This RAM is also shadowed at >8000, >8100 and >8200.
  The following memory-mapped addresses must be emulated:
  >8400, sound
  Data placed at >8400 must be accumulated and then translated for output to a Sound Blaster card. A program switch must be available that will inhibit this feature. In this case, any output directed to Voice 1 of the TMS9919 sound chip will be played on the PC speaker.
  >8800, VDP read data register
  >8802, VDP read status register
  >8C00, VDP write data register
  >8C02, VDP write address register
  >9000, speech read
  A speech read will retrieve data from the equivalent of the TMS5200 Speech Synthesizer.
  >9400, speech write
  A speech write must be accumulated and then translated for output to a Sound Blaster card. A program switch must be available that will inhibit this feature. In this case there will be no audible output.
  >9800, GROM read data register
  >9802, GROM read address register
  >9C00, GROM write data register
  >9C02, GROM write address register

- TI RAM, TI ROM
  PC99 must maintain a 64K-byte memory block, which represents the maximum address space of the 9900 processor. In the 99/4A this memory is partitioned as:

>0000->1FFF	8K bytes console ROM
>2000->3FFF	8K bytes low memory expansion
>4000->5FFF	8K bytes peripheral ROMs
>6000->7FFF	8K bytes application ROMs in command modules
>8000->9FFF	8K bytes for memory-mapped devices
>A000->FFFF	24K bytes high memory expansion

  PC99 must read a configuration file to determine which memory is considered to be ROM or RAM. PC99 must maintain an internal table that inhibits writes to memory designated as ROM.

- TI GROM
  PC99 must maintain a 64K-byte memory block, which represents 8 8K-byte GROMs at a GROM base address of >9800. Later versions may allow the maximum of 16 GROM banks, depending on how much extended memory the PC has. Although a TI GROM can contain only 6K bytes, PC99 will permit emulation of GRAM devices (such as the Gramulator), which use hardware to let RAM emulate GROM. These devices typically use 8K of RAM to emulate a 6K GROM. PC99 must emulate in software the auto-incrementing action of a GROM.

- TI I/O devices
  PC99 must emulate the action of a TI disk controller, the TI RS232 card, and the TI joystick port. PC99 will not emulate the TI cassette port.

  TI disk controller
  PC99 will emulate in software all actions of a TI disk controller, including disk read, disk write and disk format. The TI disk controller can address up to three drives which can be SSSD (360 256-byte sectors) or DSSD (720 256-byte sectors). PC99 will maintain three DOS disk files to represent these TI disks. The disk files will be called DSK1 through DSK3. These are standard DOS files and can be manipulated by DOS. They can therefore be moved to other directories, or backed up on DOS floppies or tape. PC99 will not read TI disks in a PC drive.

  TI RS232 card
  PC99 must read a configuration file that specifies the mapping of TI serial and parallel ports to PC LPT and COM ports.
  For the TI serial ports (RS232):
    A read from RS232/n will be converted to read from PC COMn
    A write to RS232/n will be converted to write to PC COMn
  For the TI parallel port (PIO):
    A write to PIO/n will be converted to write to PC LPTn
  The PC must have at least one serial and one parallel port for this feature.

  TI joystick port
  Data received from a PC joystick connected to a PC game port must be converted to the corresponding TI CRU lines. Applications software (such as CALL JOYST in TI Basic) will then react to the emulated CRU lines.

- PC99 will include a built-in debugger that allows the state of the machine to be examined and changed at any time. The debugger is accessed by pressing the ESC key. The debugger will allow the user to change any memory location (CPU, VDP or GROM), execute in single-step mode, save and read core files, and set breakpoints at any memory location.

Development stages.

Development is scheduled to proceed in the following stages:

- Stage 0
  Basic 9900, 9918A (no sprites), and 9901 emulator. Allows execution of cartridges, including Extended Basic. Does not execute any TI I/O (no disk or RS232). It is possible to save the state of the machine through the debugger by doing a save core. The machine can then be returned to this state by reading in a core file. This stage is complete.

- Stage 1 (current version):
  Includes fixes to all known bugs. Emulates 99/4A under interrupts (cursor flashes in Basic). Emulate TI disk controller (three DSSD disks) and TI RS-232 card (RS232 and PIO). 9918A emulation does not include sprites. This stage is complete.

- Stage 2:
  Emulate sprites.

- Stage 3:
  Optimize code for maximum emulation speed.
  Emulate single-channel sound through PC speaker.
  Emulate TI joystick through PC joystick connected to game port.

- Stage 4:
  Emulate multi-voice sound through PC Sound Blaster card.
  Emulate speech through PC Sound Blaster card.

- Stage future:
  Direct reading of TI disks in a PC drive.
  Utilities to read the DOS files which emulate TI disks. Allows for cataloging TI disk, and moving files from TI disk to DOS and vice versa.
  A Basic compiler written in PC C or PC Assembly Language. The compiler will extract the Basic source file from the TI disk system, generate native 9900 code in E/A3 or E/A5 format, and place the output file back in the TI disk system. The user will then be able to load and execute the file using the Editor/Assembler.

//

PC99 Update 9303023.

Stage 1 of PC99 is now ready for release. This stage includes:

- Fixes to all known bugs.

- Disk i/o.
  PC99 emulates the TI disk controller, which is capable of addressing up to three DSSD drives (720 256-byte sectors). The TI "disks" are DOS files. They can therefore be copied to DOS floppies and exchanged with other PC99 users. All functions of the TI disk controller have been implemented, including disk format, disk read, and disk write. Programs such as DISK+AID, Birdwell's DSKU, and DM-1000 6.0 all run under PC99.

- RS-232 and PIO.
  PC99 emulates the TI RS-232 card, which is capable of addressing up to two serial ports and one parallel port. You can configure the emulated ports to address physical PC ports. For example, you can configure TI RS232/1 to be PC COM2. Similarly, you can configure TI PIO to be PC LPT3.

With these additions, it is now possible to convert all your TI disks for use with PC99. The PC99 package include utilities that allows you to do the conversion in two ways:

- You can connect a TI RS-232 port directly to a PC COM port and transfer disks from a TI system directly into the emulated TI file system. You can also transfer disks in the reverse direction — from the PC to the TI. In addition, under TI Basic and Extended Basic and programs such as TI-Writer, you can SAVE and OLD (LOAD) to RS-232. The connecting cable is not part of the PC99 package, but pinouts for making the cable are included in the documentation.

- If you have a 99/4A with a Myarc or CorComp controller and PC-Transfer, you can convert TI diskettes to DOS diskettes. The PC99 package includes a PC utility to convert the DOS diskettes to PC99 format.

This version of PC99 makes it a truly useful computer. Although the 9918A emulation does not display sprites (scheduled for Stage 2), there are many TI modules that can now be used, including the 608-disk Plato educational system.

Demonstrations of PC99

An interim version of PC99 with disk i/o was demonstrated at the January meeting of the MUNCH user group and the February meeting of the TI-99/4A group of the Boston Computer Society. The Stage 1 beta version with disk i/o and RS232 i/o was demonstrated at the March meeting of the Magnetic user group in Andover. The same version was demonstrated at the March meeting of the New Hampshire user group.

PC99 will be a featured demonstration at the North-East Computer Faire organized by the Boston Computer Society to be held April 17, 1993 in Waltham, MA. In addition, there are plans to demonstrate the product at the Lima Multi-User Group Conference in May 1993. We also plan to attend the 1993 Chicago Faire.

License agreement with Texas Instruments

The developers of PC99 have signed a license agreement with Texas Instruments that permits us to distribute the 99/4A console ROMs and GROMs, and all ROMs and GROMs in cartridges that have a TI copyright. We pay a royalty to TI for each console or cartridge we supply.

The cost of the console royalty is included in the price of the product. The cost of cartridges is shown in the PC99 price list. Please note that we see the sale of cartridges as a service. The PC99 documentation has full details on how to convert TI cartridges for use with PC99.

We would also like to publicly thank Texas Instruments for their generosity in permitting us to provide this service. Even after nearly 10 years, TI CARES.

Sound Blaster Development Kit

We have purchased from Creative Labs their Sound Blaster Development Kit. This kit permits programmers to access all of the features of the card. From a PC99 point of view, this includes multi-voice sound and speech.

VMData

We have purchased this memory mahager product for evaluation. It permits the use of expanded, extended or disk memory beyond 640K under DOS, without the application (PC99) having to put the processor in protected mode. In addition, VMData can be included in PC99 without royalty, unlike products such as PharLap.

Initial testing with this package has allowed us to use the REVIEW MODULE LIBRARY feature of the console and load a full 16 cartridges simultaneously. This feature is planned for a future stage.

Comment

The development of PC99 will continue in accordance with the stages set out in the functional specification. So far, we have met or exceeded all of our design goals.

However, as before, we can make no promises that the envisaged stages will ever be completed. Please understand this before sending money.

With this mailing, we have enclosed a price list for PC99 Stage 1, together with a Command Module price list.

Thank you for your support.

CaDD Electronics,
81 Prescott Road,
Raymond, NH 03077

PC99 Stage 1 order form.

PC99 is a program that runs under DOS on an IBM or compatible PC and emulates the Texas Instruments TI-99/4A Home Computer. The emulation includes the TMS9900 processor, the TMS9918A Video Display Processor (VDP), and the TMS9901 Programmable Systems Interface in the 99/4A console, as well as the TMS9902 Asynchronous Communications Controller and WD-1771 Floppy Disk Controller found in TI peripheral cards.

With PC99 you can run TI-99/4A Command Modules and disk-based programs with few limitations.

For this release (designated Stage 1), there is no emulation of the TMS9919 in the console which creates sound, nor does the TMS9918A emulation display sprites. You can run programs that use these features, but you will not hear any sound from the PC speaker, nor see any sprites displayed.

The PC99 package includes:

- Files representing the TI-99/4A console ROMs and GROMs, as well as Extended Basic, and Tombstone City.
- Extensive documentation on disk in WordPerfect and Ascii format.
- Utilities which will allow you to move your TI-99/4A Command Modules and disk library to your PC. The utilities support the transfer of both text files and executable files (binary files).

PC99 Stage 1 is now released. This stage includes:

- **Disk i/o:** PC99 emulates the TI disk controller, which is capable of addressing up to three DSSD drives (720 256-byte sectors). The TI "disks" are DOS files.
- **RS-232 and PIO:** PC99 emulates the TI RS-232 card, which is capable of addressing up to two serial ports and one parallel port. You can configure the emulated ports to address physical PC ports.

This version of PC99 makes it a truly useful computer. There are now many TI modules that can now be used, including the 608-disk Plato educational system.

(see over)

Pricing for PC99 Stage 1

If you purchased Stage 0: $40

If you did not purchase Stage 0 but sent in $1 for support before March 1, 1993 . . . . . $80

New purchaser $98

Future releases of PC99 will cost $49 per stage. If you purchased Stage 0, or sent in $1 before March 1, 1993, additional stages are reduced to $40.

WARNING: there is no guarantee that any further development will take place after Stage 1. In addition, some proposed items in the functional specification may not be implemented in future stages because of technical problems. Please understand this before placing an order.

Please supply PC99 Stage 1 for my IBM PC in the following format (select one only):

- ☐ 5.25" 360k diskettes
- ☐ 5.25" 1.2Mb diskettes
- ☐ 3.5" 720K diskettes
- ☐ 3.5" 1.44Mb diskettes

Please mail to:

Name: _____

Address: _____

_____

_____

Command Module order form

	PHM 3000	Diagnostic		PHM 3056	Alpiner
	PHM 3001	Demonstration		PHM 3057	Munch Man
	PHM 3002	Early Learning Fun		PHM 3058	Mini Memory
	PHM 3003	Beginning Grammar		PHM 3059	Scholastic Spelling - Level 3
	PHM 3004	Number Magic			
	PHM 3005	Video Graphs		PHM 3060	Scholastic Spelling - Level 4
	PHM 3006	Home Financial Decisions		PHM 3061	Scholastic Spelling - Level 5
	PHM 3007	Household Budget Management		PHM 3062	Scholastic Spelling - Level 6
	PHM 3008	Video Chess			
	PHM 3009	Football		PHM 3064	Touch Typing Tutor
	PHM 3010	Physical Fitness		PHM 3067	Othello
	PHM 3011	Speech Editor		PHM 3052	Reading Flight
	PHM 3012	Securities Analysis		PHM 3053	Computer Math Games II
	PHM 3013	Personal Record keeping		PHM 3054	Computer Math Games I
	PHM 3014	Statistics		PHM 3055	Computer Math Games III
	PHM 3015	Early Reading		PHM 3056	Computer Math Games IV
	PHM 3016	Tax/Investment Record keeping		PHM 3065	Computer Math Games VI
				PHM 3069	Disk Manager 2
	PHM 3017	Terminal Emulator I		PHM 3090	Addition
	PHM 3018	Video Games I		PHM 3091	Subtraction
	PHM 3019	Disk Manager		PHM 3092	Multiplication
	PHM 3020	Music Maker		PHM 3093	Division
	PHM 3021	Weight Control and Nutrition		PHM 3094	Integers
				PHM 3095	Fractional Numbers
	PHM 3022	Personal Real Estate		PHM 3096	Decimals
	PHM 3023	Hunt the Wumpus		PHM 3097	Percents
	PHM 3024	Indoor Soccer		PHM 3098	Number Readiness
	PHM 3025	Mind Challengers		PHM 3099	Laws of Arithmetic
	PHM 3026	Extended Basic		PHM 3100	Equations
	PHM 3027	Addition and Subtraction 1		PHM 3101	Measurement Formulas
				PHM 3109	TI Logo II
	PHM 3028	Addition and Subtraction 2		PHM 3110	Chisholm Trail
				PHM 3111	TI-Writer Word Processor
	PHM 3029	Multiplication I			
	PHM 3030	A-Mazering		PHM 3112	Parsec
	PHM 3031	The Attack		PHM 3113	Microsoft Multiplan
	PHM 3032	Blasto		PHM 3114	Alligator Mix
	PHM 3033	Blackjack and Poker		PHM 3115	Alien Addition
	PHM 3034	Hustle		PHM 3116	Demolition Division
	PHM 3035	Terminal Emulator II		PHM 3117	Dragon Mix
	PHM 3036	Zero Zap		PHM 3118	Minus Mission
	PHM 3037	Hangman		PHM 3119	Meteor Multiplication
	PHM 3038	Connect Four		PHM 3122	Plato Interpreter
	PHM 3039	Yahtzee		PHM 3125	E.T. The Extra-Terrestrial
	PHM 3040	TI Logo			
	PHM 3041D	Adventure (disk) (disk not supplied)		PHM 3131	Moonmine
				PHM 3144	Early Logo Learning Fun
	PHM 3042D	Tunnels of Doom		PHM 3145	Sneeit
	PHM 3043	Reading Fun		PHM 3146	Munch Mobile
	PHM 3044	Personal Report Generator	X	PHM 3148	Championship Baseball
			X	PHM 3149	Space Bandits
NA	PHM 3045D	SMC Electrical Engineering Library (2 disks) (disks not supplied)	X	PHM 3150	Sewermania
			X	PHM 3151	Bigfoot
			X	PHM 3152	Meteor Belt
			X	PHM 3153	Super Fly
	PHM 3046	Reading On	X	PHM 3154	Terry Turtle's Adventure
	PHM 3047	Reading Roundup			
	PHM 3048	Reading Rally	X	PHM 3155	I'm Hiding
	PHM 3049	Division I	X	PHM 3156	Honey Hunt
	PHM 3050	Numeration I	X	PHM 3157	Soundtrack Trolley
	PHM 3051	Numeration II		PHM 3158	M*A*S*H
	PHM 3052	Tombstone City 21st Century		PHM 3165	Treasure Island
				PHM 3169	Word Invasion
	PHM 3053	TI Invaders		PHM 3177	Facemaker
	PHM 3054	Car Wars		PHM 3175	Story Machine
	PHM 3055	Editor/Assembler		PHM 3185	Word Radar

PHM 3159	Return to Pirate's Isle	PHM 3224	Moonsweeper
PHM 3194	Jawbreaker II	PHM 3225	Star Trek Strategic Operations Simulator
PHM 3197	Slymoids		
PHM 3207	Crossfire	PHM 3226	Buck Rogers
PHM 3219	Super Demon Attack	PHM 3227	Congo Bongo
PHM 3220	Microsurgeon	PHM 3229	Hopper
PHM 3222	Fathom	PHM 3233	BurgerTime

NA - not available. X - MBX (will not work).

Note: Any Command Module that uses sprites will work with PC99 Stage 1, but the sprites will not display.

Mark the Command Modules you wish to order and calculate your cost from the table below. Command Modules are supplied in PC99 format on a PC disk. Select your PC disk format below.

Please note that the sale of command modules is offered as a service. Full instructions on how to convert your existing command modules are contained in the PC99 documentation.

You may, however, wish to buy Command Modules that you do not own. We are fully licensed by Texas Instruments to distribute the Command Modules in this form for use on PC99, and have to pay TI a royalty on each module sold.

Command Module Unit Pricing

1 at $5.00 = $6.00	18 at $3.55 = $63.90	35 at $2.53 = $59.55
2 at $6.93 = $13.86	19 at $3.47 = $65.93	36 at $2.49 = $59.64
3 at $6.31 = $19.93	20 at $3.39 = $67.80	37 at $2.44 = $90.25
4 at $5.96 = $23.44	21 at $3.31 = $69.51	38 at $2.40 = $91.20
5 at $5.52 = $27.60	22 at $3.24 = $71.25	39 at $2.36 = $92.04
6 at $5.24 = $31.44	23 at $3.17 = $72.91	40 at $2.32 = $92.60
7 at $5.00 = $35.00	24 at $3.11 = $74.64	41 at $2.29 = $93.99
8 at $4.80 = $35.40	25 at $3.05 = $76.25	42 at $2.25 = $94.50
9 at $4.62 = $41.55	26 at $2.99 = $77.74	43 at $2.21 = $95.03
10 at $4.45 = $44.50	27 at $2.93 = $79.11	44 at $2.16 = $95.92
11 at $4.31 = $47.41	28 at $2.87 = $80.36	45 at $2.14 = $96.30
12 at $4.17 = $50.04	29 at $2.82 = $81.75	46 at $2.11 = $97.06
13 at $4.05 = $52.65	30 at $2.77 = $83.10	47 at $2.05 = $97.76
14 at $3.94 = $55.16	31 at $2.72 = $84.32	48 at $2.04 = $97.92
15 at $3.83 = $57.45	32 at $2.67 = $85.44	49 at $2.01 = $95.49
16 at $3.73 = $58.68	33 at $2.62 = $86.46	50 at $2.00 = $100.00
17 at $3.64 = $61.55	34 at $2.57 = $87.35	

51 or more Command Modules are $2.00 each.

Number of modules marked: _____ Cost of modules: _____

Please supply the marked modules for an IBM PC in the following disk format (select one only):

- ☐ 5.25" 360K diskettes
- ☐ 5.25" 1.2Mb diskettes
- ☐ 3.5" 720K diskettes
- ☐ 3.5" 1.44Mb diskettes

Please mail to:

Name: _____

Address: _____

CaDD Electronics,
81 Prescott Road,
Raymond, NH 03077

ANNOUNCEMENT

Subject: *First Draft 2.0 Now Shipping!*

Contact: **Asgard Software**
1423 Flagship Dr.
Woodbridge, VA 22192
(716)778-9104 (10AM-6PM EST, Mon-Fri)
(703)491-1267 (7PM-10PM EST, Mon-Sat)

Art Gibson and Asgard Software are pleased to announce the release of *First Draft* version 2.0.

This comprehensive update offers many enhancements to the operation and capabilities of an already remarkable word processor. The only popular word processor currently available that is *not* a re-write of TI-Writer, the update expands and improves on its many unique features.

Version 2.0 offers the following:

- **IMPROVED INSTALLATION. *First Draft* was the first (and so far only) word processor that can be fully customized. When you install *First Draft* it asks you a range of questions. Your answers are then embedded within the program - including screen colors, tabs, default disk drives and much more. Version 2.0 now allows you to install the program even if you only have a single disk drive.**

- **IMPROVED DISK ACCESS SPEED. *First Draft 1.0* was the first (and only) word processor for the 4A that didn't limit your text file to what you can cram into RAM - the only limit was your available disk space. In *First Draft 2.0* this is still true, but disk access is many times faster and more intelligent. If you have a RAM-disk, you most likely won't even lose a keystroke when it goes to disk with version 2.0.**

- **NEW KEYBOARD BUFFERING. Do you type too fast for TI-Writer or its clones? If you are frustrated by dropped letters at the end of your sentences, you may be interested to know that *First Draft 2.0* offers advanced buffering of the keyboard. In fact, it is virtually impossible to out-type *First Draft 2.0*!**

- **IMPROVED 40-COLUMN SUPPORT. In *First Draft 1.0* users without 80-column cards could only create documents 40 characters wide. To print in 80-columns you have to use the program's *Final Copy* formatter. This limitation is gone - in spades - in version 2.0! Not only do you get an 80-column wide page with a standard 99/4A, but the screen window scrolls over as you type (like WordPerfect), and again, you never lose a keystroke! As always, you can use the 80-column display offered by the Geneve and all TI 80-column cards.**

- **FASTER SPELL-CHECKING. *First Draft 1.0* was one of the few TI word processors with a spelling checker built-in, and the only one currently available. This spelling checker allows you to check a word or the whole document while you are writing it. *First Draft 2.0* is now officially the FASTEST SPELLING CHECKER for the 99/4A or the Geneve. This new and improved checker even beats out the previous speed champ - our own Spell It! *First Draft 2.0*'s spelling checker will find any word in the included 25,000 word dictionary in a seconds - even from floppy disk.**

- **EXTENDED MEMORY SUPPORT. Even though *First Draft* doesn't have a limit on the size of documents you can create, more memory will make any program faster. *First Draft 2.0* is the first 99/4A word processor designed to take advantage of the new generation of Extended Memory cards for the 99/4A - AMS and AEMS compatible memory cards. If *First Draft 2.0* sees an AMS compatible card, it will automatically put all of itself into it, and use the remaining space to store text before it is sent to disk. A 128K AMS will store 70K+ of text in memory, and let you move between the *First Draft* editor and the *Final Copy* formatter at the press of a button - and your document stays in memory in the process. With a 512K AMS or AEMS, you can have over 450K of text in memory; more than WordPerfect 5.1 lets you have on a 640K PC!**

- **MAKE KEYBOARD MACROS. *First Draft 2.0* is the only word processor for the 4A or the 9640 that let's you define up to of 11 keyboard macros for commonly used text - and load or save those macros to disk.**

- **FULL GENEVE COMPATIBILITY. In contrast to version 1.0, *First Draft* has been modified and verified to work fully on a Geneve with 1.14F of MDOS and 1.04 of the GPL Interpreter. Because we thought this was the case in version 1.0, we are giving *all* registered owners of *First Draft 1.0* a free upgrade to 2.0. We value our decade-long relationship with our customers more than anything else.**

- **COMPLETELY NEW MANUALS. While our original manual was pretty good, we took all the comments we received from our customers and completely re-wrote the manual for version 2.0 from scratch. The result is a much more professional, easy to follow guide to using *First Draft*.**

In addition to the many major changes in version 2.0, there are also many lesser ones, including faster search and replace, faster line deletion, paragraph reformatting that can be controlled, enhancements to the *Final Copy* formatter, access to all control codes and character graphics in your document, and more.

As with version 1.0, *First Draft 2.0* still offers many unique features unmatched by other word processors, including the ability to:

- **Write in parallel columns on the screen in *First Draft*, and format in newsletter-style columns in *Final Copy***
- **Include TI-Artist instances and Page Pro 99 pictures in your documents for logos, headlines and much more**
- **Use built-in print drivers or create your own. Print drivers allow you to take advantage of your printer without putting printer codes in your document - so your documents will print the same on any printer from an old TI Impact Printer to a new HP Laserjet 4**
- **Manage disks with a built-in disk manager with support for DISKU comments**
- **Use the program from a "pull-down menu" user interface - no command line**
- **View your formatted document before printing with the Screen Preview function built into the *Final Copy* formatter**
- **Take advantage of dozens of new formatting commands that let you to control everything about your printer and document with simple to use commands, and still use all of the old TI-Writer formatting commands too.**
- **And of course, much more**

***First Draft* 1.0 was the first all-new word processor for the 99/4A in years, and offered many promising new features found nowhere else. *First Draft* 2.0 fulfills the promise of version 1.0 with a mature program that lets you do things you would otherwise have to buy another computer to do.**

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News Release:

EXTENDED BASIC III

While there have been many revisions to TI Extended BASIC over the years, none is so extensive or fundamental as *Extended BASIC III* by Winfried Winkler.

Rewritten and revised in the native language of Extended BASIC, GPL, *XB3* features substantial improvements in the language itself, not just added calls and functions. Unlike other Extended BASIC's, this one offers tangible benefits to people who are casual XB users, as well as the hardcore programmers. Why? Because this version of Extended BASIC is the only one that will run your entire library of Extended BASIC programs, without modification, up to 50% faster then the original version of TI Extended BASIC. Unlike *Myarc Extended BASIC*™ - this version of Extended BASIC is 100% compatible with all TI Extended BASIC programs and add-on utilities.

Additionally, bugs that cause other Extended BASICs to occasionally crash (and the infamous graphics screen show that, while interesting, certainly didn't help your programs) have been eliminated. *XB3* is rock-solid and dependable - great for anyone running programs for hours or days at a time (BBS', etc.).

If you are interested in writing new programs, *XB3* offers a wide range of added functions, calls, modifications and conveniences - many of the best offered in other variations along with a number of unique changes. These include:

- Allows character definitions up to code 159 - in fact, *XB3* is fully compatible with TI-BASIC
- The GOTO and GOSUB statements will allow you to jump to a variable (as in GOTO X)
- Enhancements to the IMAGE command to allow more flexible formatting
- Extensions to the CALL MOTION command that allows you to stop and start all sprites at once
- The RESTORE command will reverse a RESequence
- COPY and MOVE commands for copying and moving ranges of lines
- The assembly LOADer recognizes a wider range of utilities including GPL utilities for manipulating a stack, RADIX-100 math, and so forth for use in your assembly subroutines. The loader also will load Compressed format assembly files with REFerences - and adds a wide range of new REFerences available for called subroutines
- A range of new calls including:
  - ALL(N) - Fills the entire screen with the specified ASCII code
  - ALOCK(N)- Tests whether the Alpha Lock is set - returns a value
  - BYE - Now legal within a running program
  - CHAR ALL - For controlling the character set
  - CHIMES - Sounds a chime
  - CLRS - Clears only the text area (columns 3-30)
  - COLOR - Now accepts the colorset description "All"
  - FIND - Will find the specified string within an array of strings
  - GPEEK - GPL Peek command
  - GPOKE - GPL Poke command
  - HONK - Produces a "honk" sound
  - KEYS(L$,P) - Waits for the keys specified in the string I$ and returns the value P with the keys position in the string
  - MLOAD - Loads a memory-image file into the specified memory location
  - MOVE - Move ranges of memory between RAM, VRAM, ROM and GROM
  - MSAVE - Save a portion of memory to disk in memory-image file format
  - NEW - Now legal within a program
  - PRNTPAT - Print a character definition to an Epson compatible printer
  - QUIT OFF/ON - Turn on/off the QUIT key
  - SCREEN ON/OFF - Turn off and on the screen
  - VPEEK - VDP RAM peek
  - VPOKE - VDP RAM poke
  - WAIT - Pause program for a specified period
- A new range of functions have also been added:
  - ASC - Will handle an empty string without crashing a running program
  - CLOSE - Will close all open files at once
  - DEF - All user defined functions may be used outside of a running program at the command line
  - DATE$ - Returns the current date with a clock card
  - HEX$ - Returns the Hexadecimal equivalent of a decimal number
  - LWRC$ - Converts a string to lower case
  - TIME$ - Returns the current time with a clock card
  - UPRC$ - Converts a string to upper case
  - VAL - Will now convert a hex string into a numeric value

- Virtually all math functions and floating-point math routines (COS, SIN, etc.) have been re-written and are typically 100% to 200% faster. Extensions have been made to the RND function to allow ranges and more randomization
- A range of new commands available at the command-line, including:
  - # - Displays a catalog of the device in quotes after the function
  - APPEND - Defines all Control characters in inverse video
  - ERASE - Allows you to delete a range of lines
  - OUTPUT - Saves the range of line numbers specified to disk in Merge format
  - PERMANENT - Allows you to turn off or on the true-lower-case character set as well as deactivate lower case letters
  - SAVE - The "Protected" option now truly protects a program from being listed
  - SIZE - Displays the amount of Low Memory space available as well as other space
  - USING - Lists all CALL statements in a program
  - VARIABLE - Lists all the variables in a program

While many of the features and all of the speed enhancements in *Extended BASIC III* are unique to this cartridge, it is compatible to some degree with *Mechatronics Extended BASIC*.

Extended BASIC III is currently available in disk form for those users with a Mechatronics GRAM-KARTE for $39.95.

A 96K cartridge version that requires only a console and 32K memory expansion is expected to be available by June 15, 1993 for $74.95.

Finally, available by April 15, 1993, the *XB3 SUPER MODULE*. This 192K module has built into it:

- *Extended BASIC III*
- The TE2 cartridge - allowing you to perform true text-to-speech in *XB3* WITHOUT any additional software(!)
- The Editor/Assembler cartridge
- TI-Writer, it's Editor and Formatter
- The Remind-Me! appointment program
- Mass-Transfer
- A full disk manager
- various other miscellaneous utilities

For a list price of $99.95. This cartridge is an entire productivity package all-in-one module - plug it in and you may never have to unplug it again. This version requires 32K and a disk system.

Send all inquiries to:

Asgard Software, 1423 Flagship Dr., Woodbridge, VA 22192

XB3 v1.0 Super Module Benchmark

Benchmark	Time (Seconds) XB3 1.0	TI XB	Difference
Graphics/Display:			
Print "Hello" 1000 times	63	91	+44.4%
Draw 100 random bars (HCHAR & VCHAR test)	21	44	+109.5%
Create 28 sprites 5 times with a pause between incidents	40	47	+17.5%
Without a pause	10	13	+30.0%
Program to walk a character across the screen	16	20	+25.0%
			+45.2% faster
File I/O:			
Read 1000 lines of a text file from an HFDC	55	63	+14.5%
Write 1000 lines of text to an HFDC	69	76	+10.1%
			+12.3% faster
Math functions:			
Count from 1-1000 and 1000-1	43	52	+20.9%
Calc Sin/Cos/Tan 0-360 degrees	156	188	+20.5%
Calculate SQRT of 1-100	12	17	+41.6%
Generate 1000 random numbers from 1 to 100	37	81	+218.9%
			+75.4% faster
String functions:			
Build 100 strings by adding a character at a time from 1-250	9	12	+25.0%
Parse 1-250 characters from 100 strings	25	32	+28.0%
			+26.5% faster
		Average of 13 Benchmarks:	+77.3% faster

TI's "Video Controller"

by Charles Good
Lima Ohio User Group
March 1993

HISTORICAL BACKGROUND:

"MULTIMEDIA" is a hot concept discussed today in many computer magazines. The term usually refers to combining CD ROM, text, graphics, digitized sound, and graphic images from various other sources in a managed sight and sound presentation all under computer control. In 1981 CD ROM did not exist, but VCR's did as did laser disc players playing sight/sound disks the size of LP's.

At the May '81 Consumer Electronics Show TI exhibited a side car peripheral called the VIDEO CONTROLLER designed to mix VCR and laser disc output with 99/4A sound, speech, and screen displays, all under the control of a BASIC program. This first showing of the VIDEO CONTROLLER is described in words and photos in *99'er* Magazine v1 #2 (July/Aug 1981).

The "Video Controller" Bill Cosby video tape we have available in the Lima UG library came from this 1981 show. This video shows a cigar smoking Bill asking people to press a 1, 2, or 3 on the computer next to him in order to see video demos of TI software located at specific places on the video tape.

The November 30 and December 7, 1981 issues of *InfoWorld* contained announcements about the release of the Video Controller and associated Course Designer software. This peripheral was at the Jan. 1982 Las Vegas CES show, the same show that TI used to introduce the Peripheral Expansion Box to the world. V1 #4 of *99'er* Magazine has a good photo and article about the VIDEO CONTROLLER at this show. List price in 1982 was $699.95 with one set of cables—plus $99.95 if you needed another set of cables to hook it to a different kind of VCR or laser disc player—plus $199.95 for the "Course Designer Authoring Package". That's a whopping $1000!

The Course Designer Authoring Package was an Extended BASIC two disk set which included TI's Text-To-Speech. It was designed to aid in using the VIDEO CONTROLLER for Computer-Aided Instruction but could also be used to develop CAI lessons that didn't use it. CDAP was reviewed in *99'er* MAGAZINE v1 #6. I have this very rare software and may review it in a future article. The CDAP subprograms are dated in REM statements as late as 5/12/82, so the CDAP could not have been available in late 1981 as TI's publicity states. Thanks to Bill Gaskill, I also have a copy of an official 1982 TI brochure showing the VIDEO CONTROLLER and a fancy looking laser disc player. The brochure suggests business training applications for the VIDEO CONTROLLER.

TI listed the side car peripheral as PHP2300 in its Jan-June and June-Dec 1982 retail price lists stating, "The Video Controller is intended for industrial and commercial use; it is not intended for use in the home". This statement means it DIDN'T have FCC Class B (home use) certification. Some dealers in 1982 advertised it at below list. The earliest example I can find is a $539.95 price quoted in an ad on the inside front cover of *99'er* Magazine v1 #4 (early 1982). Later, TI developed the VIDEO CONTROLLER as a PE Box card, PHP1290. This card is listed for "$399.95 (Pending FCC Certification)" in TI's last official 99/4A price list dated June-Dec 1983.

And yet—in spite of the press releases, the displays at those computer shows, the listings in official TI price lists over a period of several years, and dealer ads suggesting they were in stock—TI sold few or no side car video controllers and definitely didn't sell any of the cards. The card and probably also the side car peripheral are, I believe, "Never Released Peripherals". Also, in spite of being listed as PHD5068 ($199.95) in TI's last official price list, TI apparently never sold its Course Designer Authoring Package.

Why was the VIDEO CONTROLLER and associated software never released? I suspect the answer has something to do with price and the initials "FCC". The peripheral was the second most expensive 99/4A item in TI's price lists (after the impact printer) and connected to VCR's or laser disc players costing (in 1982-83) $1000+. That's a lot of money for the typical "Home" computer owner! Since TI specifically states in my June-Dec 1982 price list that the VIDEO CONTROLLER is for "industrial and commercial use", and since TI's last catalog says "pending FCC certification", I suspect that because of radio frequency interference TI never did obtain FCC

permission to sell the VIDEO CONTROLLER. Evidence discussed below supports this hypothesis.

THE VIDEO CONTROLLER CARD:

Thanks to the generosity of Charles Stringer and Mike Wright, I have an actual VIDEO CONTROLLER card, its 1982 user guide, and a circuit diagram of the card sitting in front of me as I write this. The card comes in a TI clam shell with an official looking printed label that says "Video Comtroller Model No. PHP1290". The serial number space on the label is blank, and hand written are the words "Qual Unit Not for sale". Sticking out the back of the card is a 26-pin flat edge connector and a female mini jack like those on a TI cassette program recorder. If you remove the clam shell, you can see lots of chips that say El Salvador, Malaysia, and Korea. Most of these chips have the TI logo, but none say U.S.A. I can see why many TI products are labeled "Assembled in USA with domestic and foreign parts"! The important chips seem to be a PALI216CH/8237 and an AMI8145CDZ/ 1501392-19. My circuit diagram identifies the AMI chip as a "TMS4732 4K x 8". My circuit board has "VIDEO CONT. 1050217-2" engraved on it, apparently a TI part number.

My schematics indicate that the "Formal Release" product number would have been 1050218. These schematics from TI's consumer products group have several signatures dated between June and August 1982. Of great significance are the "1-3-84" date of the signature immediately below the words "Final Release" (over two months AFTER TI left the Home Computer market) and the fact that the "FCC APVD" box lacks a date or signature. My unpublished preliminary PHP1290 doc says the card has FCC class A (commercial, not home use) certification, but the lack of a signature on the schematic suggests that even this low level certification was not achieved.

In addition to the RF modulator or video cable we normally use, 5 other cables are needed to hook the VIDEO CONTROLLER to a VCR. One cable goes from the card's edge connector to the VCR's remote control. Other cables go from the VCR, the monitor, and the console's audio/video out jack to a "relay box". This box, under control of the VIDEO CONTROLLER, switches the monitor back and forth between computer audio/video and external audio/video.

Unfortunately, I don't have a set of cables or the relay box; so I can't make my VIDEO CONTROLLER card do its tricks. When I put the card into my PE box, the Horizon Ramdisk config program tells me that the card has a CRU address of 1CO0. From BASIC command mode, I can enter OPEN #1:"VC.E",INTERNAL without getting an error message. The docs say this means my card is installed properly.

CAPABILITIES OF THE VIDEO CONTROLLER:

Although I can't test my VIDEO CONTROLLER, my documentation tells me what I should be able to do. What follows is based largely on this documentation.

The VIDEO CONTROLLER hooks up to some 1/2 inch (VHS or Beta) or 3/4 inch ("professional" size) VCR's or a Pioneer laser disc player. TI provides a list of 1983 machines known to be compatible, but some other VCR's of that era, not on TI's list, are probably compatible. Even if I had a proper cable set, I couldn't today go out and buy a VCR to use with my VIDEO CONTROLLER card. You need a VCR with a WIRED remote control jack and an audio dub input jack. This is not the same as the "audio in" on the back of most VCR's. Audio dub allows you to add audio to prerecorded video without erasing the video. Such VCR's were sold in retail stores in the early 80's for about $1000. Most were top loaders. I once owned one and now wish I still had it. The OSU Lima Campus still has a couple of these machines. Few modern VCR's sold for home use have audio dub, and WIRED remotes are unheard of these days. [But some of today's VCR's have what is called a Control S port that does the same thing.—Ed.]

The VIDEO CONTROLLER allows you to use a VCR as a mass storage device, almost exactly as one would use CS1. "SAVE VC" saves a BASIC (either BASIC) program to video tape starting at the beginning of the tape. "SAVE VCA" saves a program starting at the current tape position. "OLD VC" and "OLD VCA" work similarly. You can also store data files on video tape by using OPEN #2: "VC",INTERNAL and PRINT #2:"DUB" to open the VCR dub channel, and then PRINT #1: "DATANAME",FIXED to send computer data to a previously OPENed data file stored

on video tape. Just as with cassette tapes, record length must be fixed at 64, 128, or 192, and APPEND, VARIABLE, and RELATIVE are not allowed. You can use PRINT, INPUT, and LINPUT on such video tape files. Of course, you can't use a laser disc as mass storage since (like CD ROM) it is a read only media.

There are other commands that allow the 99/4A to control the video unit. First you OPEN #1:"VC",INTERNAL and then you PRINT #1 the commands to send it. The following commands are available:

PRINT #1:"ONRL" sends video tape (or laser disc) audio and video to the monitor.

PRINT #1:"OFFRL" turns off the relay box and sends computer audio and video to the monitor.

PRINT #1:"INIT" marks the start of the tape. I don't know if this means the current tape position as "start" or whether the tape rewinds to its beginning.

PRINT #1:"GOTO",LOCATION-NUMBER forwards or rewinds the tape to a specific location. Each number is 16/30 of a second of tape time on VHS systems.

The following PRINT #1:"COMMAND"'s do the same thing as pushing buttons on the front control panel of the VCR: STOP, PLAY, FWD, REW, REC, and PAUSE. With a laser disc player, commands are available to display a specific still image frame or chapter, which is a large group of frames. Viewing a chapter is similar to playing a specific track on a modern audio CD.

The VIDEO CONTROLLER's capabilities were all designed to allow interactive computer video training. These lessons could consist of computer segments with computer text/speech/graphics, video segments, test questions (multiple choice or T/F), and branch points depending on the answers to the questions. Multimedia!

A modern example- at Michigan's interstate highway tourist information centers just across the Indiana border, you can walk up to a computer terminal displaying a multi-color Michigan map with numbers on the map, press a number on the keyboard, and see a short computer AND VIDEO TAPE segment showing the neat tourist stuff at that location. You are then returned to the Michigan map where you can press another location number. Michigan could have done this in 1982 if the 99/4A VIDEO CONTROLLER had been available. This device really was years ahead of its time.•

From First Draft To Final Copy

WRITTEN BY DEANNA SHERIDAN
NORTHCOAST USERS, CLEVELAND, OHIO

I have been anxious to use the new word processing/publishing program that Art Gibson was writing ever since visiting with him at Lima last May. With a little work, you can do things with this that TI never dreamed of when they wrote the first TI-Writer program.

Before trying out any of the other features, I wanted to see if you could place text next to graphics, and with some experimentation, I was able to do so. Now that I have accomplished that, let's get into the features of the editor of "First Draft".

Those of you who are "fast typists" should enjoy the cursor movement in this and know that your typing errors should be cut down considerably. I have yet to have a letter drop off on me while "rounding" the end of the line as always happens in TI-Writer.

This program is an extension of the Newsletter Printer that some of us have enjoyed for a little over a year. There are features in the new editor that some may like and some may wish for some of the old TI-Write/Funnelweb features that were left out. Remember that the formatting depends on the DOT commands and can be done in Funnelweb if you still feel more comfortable in that environment. The formatter is the work horse of the program and will read either D/V80 or DIS/FIX80 files for printing.

If you have a 40-column screen as most of us do, you will have 40 columns on which to type on the screen. There is no scrolling. I know of many in the TI-World who did not like the scrolling and would set their tabs so that they would only type what they could see on the screen. If you have an 80-column screen, you will have 80 columns to view and can even type in "columns" if you wish.

When running the program the first time a configuration file must be created for certain defaults, screen size, do you want word wrap, default drives for files and spell checking, etc.

FEATURES PULL-DOWN MENUES

After entering the editor there are five pull down menus on the command line...FILES, STRINGS, LINES, OTHER and HELP. The FILES menu consists of 1. Catalog. Within this function one can unprotect a file, print the file directory, delete a file, protect a file, select a new drive, mark a file. There are three "FCTN" keys that almost make this catalog a disk manager. A file can be renamed, file comments can be saved, and a disk can be formatted. How many times have you done a large file, only to find that the diskette was full, and of all times, you didn't want to have another initialized disk anywhere. I think this is a great feature.

The other file operations are Open, Save, Close, Merge, view and quit. The merge function is not as flexible as with Funnelweb in that you cannot choose a certain number of lines to merge. The entire file is merged.

Under STRINGS, you can find a string, change a string, or check your spelling. One word at a time can be checked, or the entire document. For the first time, TI99 people can check a document while still in the editor. The entire document or just the word at the cursor can be proofed. I have never been a fan of spell checking on the TI because you still need to know the correct spelling, and it is extremely slow. I know a lot of people have wanted this feature though and will probably make good use of it. I usually print out my document, mark the typos and then use the replace string function to do my corrections. It is a lot faster.

LINES lets you go a certain line number, copy lines, or move lines with the same parameters that Funnelweb uses.

OTHER is where Tab settings are changed; columns can be set up with an 80-column device; screen colors can be changed; dictionary drives can be changed and files can be converted between D/V80 and DIS/FIX80. The editor only loads DIS/FIX80 files. Therefore, if you have a TI-Writer file, you want to use in First Draft, it must be converted. DIS/FIX80 files take up a lot more room than D/V80 files. Remember that the Formatter will read either type, and after you have finalized your copy, you may wish to convert it to the D/V80 and delete the DIS/FIX80 file.

By hitting FCTN2 (Insert), typing can be done to insert words without the line splitting. Hitting the FCTN2 key again, puts you in overtype mode. CTRL3 toggles the cursor from the left to the right margin. CTRL4 sends you to the next paragraph. CTRL5 goes to the beginning of the file. CTRL6 goes to the preceeding paragraph and CTRL7 goes to the end of the file. CTRL8 and 9 are used to display chars 30 and 31 used for printer commands. CTRL0 erases to the end of the line.

Comparing the above features, you can decide if you want to use the FIRST DRAFT editor or stay with the Funnelweb editor. NONE of the above features has anything to do with the way the pages are printed. These are done with DOT commands which can be placed in any editor.

DOT COMMANDS ARE THE HEART OF THE PROGRAM

If you have used Newsletter Printer at all, most of the dot commands will be familiar, and you know that you will need to build a printer definition file to customize the features of your printer. A file is included which is based on the Gemini10X. A lot of us have newer printers that print with several fonts, quad high, reverse line feed, etc. These will need to be placed in the file. There are 17 user defined dot functions that will accept up to 30 characters.

Quickly running through the commands, some are similar to Funnelweb and others peculiar to First Draft. BP begins a new page. C1 x,y will set condensed print with one column setting the left margin at 'x' and running for 'y' characters (length). C2 does the same thing for two

columns. CJ is the centering command. DI displays the next line. FC is a footer, center justified. FI is the fill command. FL is a left justified footer. FR is a right justified footer. GA is the graphic name of your TI-Artist Instance or Page Pro Picture. You can have up to nine of these.

GM sets the left margin for a graphic. The total line length of a graphic cannot be more than 60. GR prints the graphic. GR 1 prints graphic 1 at the margin set by GM. Up to three graphics can be printed across the page at a time. GR 1,2,3 would print one on the left, one center and one on the right. HC prints a header center justified. HL prints a header left justified and HR prints a header right justified. IF is include file. IN indents x number of spaces. LJ left justifies a set number of lines. LS sets line spacing up to 255. PI serves the same purpose as CI except the type is PICA. P2 sets 2 column pica. PA resets the page number when using automatic page numbering

PL sets page length, PT is a prompt command to allow the entering text at the time of printing. RJ right justifies x number of lines. These commands are preset and not changeable.

The following commands can be customized for any printer. I think Marty could even set up a printer driver for his laserjet with the options available here.

There are 9 available .bx commands. These commands do not require an on/off function such as underlining on and underlining off. So each command can stand on its own. It can be used similar to the transliterate code in Funnelweb. Several examples are given for printing small graphics such as a smiley face, copyright symbol and heart. I developed a number of these type of graphics a few years ago when I did a Christmas disk of graphics. These could all be used in the .bx commands in First Draft.

The BO commands prints in bold. BS is the backspace. BP is double wide print. BF is high print (superscript). IP is italic. LS is six line spacing. LT is 8 lines for graphics. LP is low print (subscript). MB is no bold (cancels bold). MD is no double wide. MH is no high print. MI is no italics. ML is no low printing. MU is no underline. PC is print condensed. PD sets printer name for either serial or parallel. PI c is the prompt input char. PP is pica print. PS defines page number character. RS defines require space character. UN underlines text. there is a set of nZ user defined commands and related UN commands for custom on/off functions. In fact, you could combine bold printing and underlining in one command for special effects.

Because you set the printer definitions yourself according to your printer manual, any of the above could be changed to a command you might use. For instances, I probably would NEVER use italics, superscript and subscript. I could change all of these to commands for fonts that my XB1000 supports. Thus, building a special printer driver only limits you by the effects supported by your printer.

Thus far, there are THREE Artist instances in this printout. The title and the two small subheadings. The printer command for reversing to the top of the page is 27,12. Either change one of the preset commands to this or

create a new one in the printer configuration file. Change the page length to double the 66 lines. Print out a sample copy. Insert the command to reverse to the top of the page. Insert the command and change your left margin to correspond to where you want it to start on the right hand side of the page. For some reason, I found this very tricky and had to try many many times before it finally worked for me. I don't know what I did differently to finally make it work, so be patient because it does work. When I had the first page full, I inserted a page break to make it go to the second page. If you want to insert a graphic within the text, you will have to create a blank area for the graphic, send the reverse line feed command and then line feed down to where you want the graphic printed. If necessary, line feed again to where you want to pick up text.

An entire newsletter could be printed from one file. At about 190 lines, the file is saved and then that many lines are brought in at a time to view (similar to the way a picture is brought in in Page Pro.) About the only drawback to this is that DIS/FIX80 files are large. You will need a lot of disk space for a large article.

CONCLUSION

When using Newsletter Printer, I thought it was one of the easiest programs I ever picked up to master for the features it provided. I feel the same after writing this article with the First Draft editor. There are only minor problems that I noticed. One, when a file is saved, there seems to be no opportunity to change the name of the file. Sometimes we like to save a file under a different name than when it was loaded or to a different disk drive. I can find no way to do this. One way around this would be to go to the cataloging function and change the name of the old file before saving.

There was a comment at the Northcoast meeting this month that one of the members would like to be able to merge only parts of files, or save parts of files. You loose both of these with First Draft. It's all or nothing. I have already come to enjoy typing with this editor and feel I would choose it over the Funnelweb environment. However, I understand there are major changes in the 5.0 Funnelweb soon to be released, and you may find reasons to choose that environment when it arrives. I tried the replace string function, and believe me, you will enjoy this compared to the Funnelweb version. Remember, this program was conceived to assist newsletter editors and that is still the thrust of the program. You may or may not want to use it if you are just printing a letter without special formatter features or graphics. I am continually amazed that people are still coming up with new hardware and software for the TI 10 years after we have become an orphan.

NEWS! FROM BUD MILLS.

```
**************************************************************************
* NOTICE: The files listed are NOT Freeware or Fairware and may only be used
*         if REGISTRATION is made to BUD MILLS SERVICES. Any royalties will be
*         forwarded to OPA & the MIAMI USER GROUP. If this copy was purchased
*         by you from the MUG,BUD MILLS SERVICES,or OPA then your REGISTRATION
*         is automatic.....
**************************************************************************

THE FOLLOWING PROGRAMS ARE COPYRIGHTED 1990 AND 1993 BY BMS AND OPA.

!READ-ME        The text file, which you are now reading.
CFG             RAM >E000 CFG for the version 8.xx series of ROS.
LOAD            Extended Basic loader for the above CFG file.
MENU            HORIZON 7.39 powerup MENU program by John Johnston.
OP8DEMO         Extended Basic program to demo OPCODE >08 SCRATCH RECORD.
OP8DEMO-O       Assembly object file for the above Extended Basic program.
OP8DEMO-S       Assembly source file for the above Extended Basic program.
      CORRECTED VERSIONS OF ROS 8.14
ROS-B  2-93     DSR >4000 ROS version 8.14C FOR USE WITH ANY TI WITH A MYARC FDC
                OR HFDC DISK CONTROLLER... COMPATIBLE WITH TIM,SOB, POP-CART.

ROS-C  2-93     DSR >4000 ROS version 8.14C FOR USE WITH ANY TI WITHOUT A MYARC
                DISK CONTROLLER... COMPATIBLE WITH DIJIT, MECHATRONICS 80 COLUMN
                TIM, SOB, POPCART, CORCOMP or TI DISK CONTROLERS

SHOW            Demo fast slide show program for use with a RAMBO/HORIZON card.
SHOW-S          Assembly source file for the above RAMBO demo program.
USRDSR          Demo of a 'USER DSR' for the RAMBO/HORIZON card.
USRDSR-S        Assembly source file for the above RAMBO demo program.
TST             Test Program for ALL HORIZONs. Requires chart to interpert result
                Chart is available to Registered Owners of ROS 8.14.
MEMTEST + TEST/O  Memory test programs for 8k HORIZONs.
MEGTEST + TEST/32 Memory test programs for up to 1 MEG HORIZONs.
```

The operating instructions for the RAMBO/HORIZON ROS 8 are distributed in a printed manual provided to registered buyers only! Many other tips are included to assist you in installing and using ROS 8 on your HORIZON RAMDISK.

It is recommended that you read the operating manual before running the CFG or any of the demo programs included.

This update of the ROS and CFG includes ALL of the features from ROS 8.14 without the "!I GOTCHA!" problem... The first thing which should be mentioned

NOTE.... the ROS-B and ROS-C files supercede ALL previous versions of ROS 8.xx

The CFG will display which version that is loaded on your RAMDISK. To load the correct NEW version, YOU will have to determine which file you will need. This depends on the other cards in your system. You can update your version without affecting any of your present data that is on your ramdisk. Load the CFG progr and move to the screen where you can L for LOAD and then where the screen show Load DSK1.ROS add the -B or -C (DSK1.ROS-B) or (DSK1.ROS-C) to match your

system. Enter and then answer Yes when asked if you want to save data... Th ROS you have selected will then load.

NOTE... IF you change controller cards to the type of the OTHER version of R THEN YOU MUST CHANGE the ROS.... This also applies if you move the ramdisk a system that has the OTHER style controller.

AFTER you have made the above changes, we STRONGLY recommend that you make a backup on a seperate WORK disk of the ROS as you have it loaded. This is don by using the Save option on the CFG screen. DO NOT USE THE ROS 8.14C DISK...

In ROS 8.14b We corrected the spelling of the ERROR message !I GOTCHA! to re CNTLR FAIL (for disk controler fail). The !I GOTCHA! message was not a vir and certainly was not intended to cause panic. Some users have seen the mess displayed during a disk access and may have even lost data. We have duplicat the conditions and found that in some cases the ROS had been faulted which w affecting program executions and causing unpredictable results. OPA has also determined how the Horizon Ramdisks and Myarc Controllers behave during POWER-UP and has provided the ROS-B and ROS-C to correct that behavior.

We have also determined that a problem exists in the design of the HORIZON RRD+, 2000, AND 3000 Ramdisks that are equipped with 32k x8 or 128k x8 MEMORY chips. What we found and corrected was the POWER-DOWN of the P-BOX introduce noise into the DATA and DATA lines and that an memory address was being turne on in an area that had previously not been used. We are now using that area t locate part of operating system that we used to put in VDP which interfered with all 80 column cards. The solution was not to move the code but to prote the memory. The FIX is available from Bud Mills Services, with detailed instructions.

If you have any questions please feel free to contact us.

Bud Mills Services
166 Dartmouth Dr.
Toledo, Ohio 43614 U.S.A.
(419) 385-5946 6pm- 8pm EST ask for BUD

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