BITS BYTES AND PIXELS!

LIMA 99/4A USERS GROUP
PRESIDENTS MONTH
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COMMENTARY

Owning a home computer is probably one of the best intellectual exercises one could have. One's mind is not unlike one's motor muscles;to be fit is to be exercised. A home computer is to the mind what jogging is to the body. Even games are stimulating mental and hand-eye coordination exercises

Owning a home computer allows a better understanding of the "state of the art" in data handling,processing and communications equipment and software.

Where all this leads to is the fact that you are missing something if you don't watch "Computer Chronicles"from your Public Television Station (Channel 57 WBGU) at 0900 on Saturdays. This is a high tech interesting and informative program that every home computer affecinado should not miss.

DUES DUE

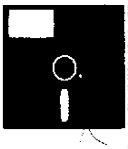
Has your membership expired? Check your card to see if it has. Contact Tim Martin who will gladly take your check. Your membership card is the key to the 2000+ programs in our software library. Without the key you can't get in!

TIPS

Thanks,again,to Jim Peterson for another of his "Tips form the Tiger Cub" Jim,one of the stalwarts of the 99/4A world,also has available for sale a variety of program aids that might be of use to you. His address is on the Tip sheet.

MISCELLANY

During a riverboat outing the weather turned cold and rainy and the passengers huddled together for warmth. The boat captian shouted down to the crew's quarters,"Is there a mackintosh down there large enough to keep three young ladies warm?" "No," came a booming answer "but there's a McPherson who'd like to try."



TI Trivia comes to us from Northwest Ohio 99'er News

TI TRIVIA!!

by Arthur Author

1. What do the letters "C.P.U." designate?
2. The 99/4A is a __ bit computer?
3. Where did the word "bit" come from?
4. Where did the word "modem" come from?
5. What does "BASIC" stand for?
6. Who invented "FORTH"?
7. Why is "FORTH" not spelled "FOURTH?
8. Exactly how many bytes are in a kilobyte?
9. Which is faster: Serial or Parallel data transmission?
10. What came first: FORTRAN or BASIC?
11. What was the first computer called?
12. Where did the word "FORTRAN" come from?
13. What is easier to learn: Quantum Physics or Graphic Programming Language?
14. Name the two unconditional line transfers in basic?

BITS,BYTES & PIXELS

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TRIPLE-TECH Notes

Mel Nomina sends along these personal observations on the Cor Comp TRIPLE-TECH card for the PE box. This card has a built in clock with battery back up, a 64K printer buffer, and a way of installing the guts of the speech synthesizer inside the PE box. TRIPLE-TECH is sold by Tex Comp and others for approximately $110.

CLOCK- can be used to keep record of the time you were on the computer, after you write a little program to do this. You can document programs or files with time and date, and put time and date on printouts. Mel published a small program using the clock in our December 85 BITES BYTES&PIXELS. He has another in this issue.

PRINT BUFFER- dump a DIS/VAR 80 file such as editor/ assembler or TI Writer to printer in seconds. Note: printer must be parallel. A hardware switch (in the back of the PE box) lets you print out as many copies as desired. Mel is disappointed that the print buffer will not accept Personal Record Keeping or Multiplan files due to the nature of these programs.

SPEECH SYNTHESIZER- It is nice to get it out of the way. The console looks nicer and isn't as bulky.

TI TRIVIA!! ANSWERS

by Arthur Author

1. Central Processing Unit.
2. 16.
3. Binary digIT.
4. MOdulator DEModulator.
5. Beginners All-purpose Symbolic Instructional Code.
6. Charles Moore.
7. The IBM that Moore was creating FORTH on would only accept 5 letter names.
8. 2^10 (two raised to the tenth power) = 1024
9. Parallel.
10. FORTRAN.
11. U.N.I.V.A.C.
12. FORmulae TRAnslation.
13. Quantum Physics.
14. GOTO and GOSUB.

ADVERTISING POLICY

Advertisements from dealers and manufacturers of computer equipment as well as "For Sale" notices are carried in BITS BYTES&PIXELS solely as a service to our readers. No fee is charged for advertisments. The editors of BITS BYTES&PIXELS are the sole judge of which advertisements will be reproduced in the newsletter.

A potential PRK module problem:

Does anyone have problems when printing selected items? It prints the index, it starts printing the item #, then it locks up with a MEMORY FULL IN 0 error. This happens to Mel Nomina about 1 out of 4 times.

HORIZON RAMDISK - Update

This card for the PE box was demonstrated at the January meeting and generated considerable interest among those present. The card emulates a single or double sided disk drive, but at assembly language speed. It can be used IN ADDITION TO other memory expanders such as 32K or 128K cards. All programs in the card's memory remain there even after the PE box is turned off since the Horizon Ramdisk is backed up by nicad batteries. A feature not mentioned in the fact sheet published in our December newsletter is a built in Disk Manager 1000 (see December 85 newsletter for a review of this program). Just type CALL DM from TI Basic or Extended Basic and DM 1000 (the latest version 2.2) loads instantly!! Never again will I need to use my Disk Manager 2 module.

next column please

With many fancy computers you must load a disk operating system (DOS) from disk into RAM each and every time you turn on the computer. The ramdisk operating system (ROS) is in RAM, but only needs to be loaded once. After that it stays in the battery backed up ramdisk RAM. Since the ROS is always there, it acts as if it was contained in an instantly available ROM chip. However, unlike ROM based programs, the ROS is easy to change and update. Version 2 of the ROS has been released for the Horizon Ramdisk since our January meeting. All known bugs that were mentioned at the January meeting have been corrected by Version 2, including the null string problem. If additional problems with the ROS are found a Version 3 will be issued.

The Horizon Ramdisk is manufactured by Horizon computer Peripherals, P.O. Box 554, Walbridge OH 43465. To see one, contact Charles Good or Hal Sehnert of the Lima Area User Group. To place an order, phone David Romer at 419-666-6911. Tentative prices are $165 for a "single sided" 360 sector card and $245 for a "double sided" 720 sector card. Compared to the prices quoted in cataloges for 128K cards, these prices seem very reasonable.

C. Good

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CHARLIE SAYS:

THE HEAT PROBLEM - KEEPING IT COOL

Most of us have hundreds or perhaps thousands of dollars invested in our computer hardware and software. We should therefore do all we can to keep our expensive equipment functioning properly. When a major piece of computer equipment suddenly ceases to function at all the usual reason given is that it "burned out". Such "burning out" due to heat can be caused by electric current irregularities, or by too much physical heat.

ELECTRIC IRREGULARITIES can sometimes "just happen" and sometimes can't be prevented by the equipment user. The internal design of the equipment is largely responsible for protecting against voltage that is too high or too low. There are, however, a few precautions that should be observed.

Read instructions carefully when connecting peripheral devices to each other and especially when making internal modifications to equipment. It is very easy to destroy equipment by making improper connections. A piece of equipment was once delivered to my laboratory with the following label attached at the factory:

> PLEASE, IF YOU HAVE TROUBLE READ THE INSTRUCTIONS. IF YOU CONTINUE TO HAVE TROUBLE, FOLLOW THEM.

This is good advice.

Another thing that can be done to protect against electrical irregularities is to ground all your computer equipment. If you are forced to use a two pronged wall outlet, then a separate grounding wire should be instaled.

next column please

Potential irregular voltage from the power company can sometimes be dectected visually. If the room lights start getting dimmer and then brighter shut down your computer (I have seen this happen several times at my home). If there is an electrical storm outside, don't operate the computer, since you risk sudden power failure or possibly a lightning hit. Purchasing a multiple plug box with a built in surge surpresser is probably also a good idea, although this will not protect against lightning.

PHYSICAL HEAT- Probably most of you already follow the above suggestions concerning electrical problems. Many computer owners, however worry little about the heat generated by their equipment. It is assumed that the equipment is built to tolerate the internal heat that it generates, but this is only true under ideal conditions with plenty of natural air circulation. I continue to wonder if my Gemini 10X printer died ($150 to fix it) because I left it on for several hours, not continuously running but just on. The service man said that shouldn't cause my printer to die, but I wonder....

Most pieces of our equipment have little pegs on the bottom. This includes the 99/4A console, the PE box, TI stand alone disk drives, as well as most monitors and printers. These pegs protect furnature against scratches, but they also provide a space under the equipment so air can get into bottom cooling vents. If you allow any of these peices of equipment to extend over the front or back of a shelf so that all four of these pegs don't touch bottom you are asking for trouble by blocking air circulation. A few years ago a friend of mine burned out a small color TV by doing just this.

next page please

Do you stack pieces of equipment such as a monitor on top of the PE box, or one external disk drive on top of another? Heat from the lower devices enters the cooling vents of the upper devices. Is your equipment in an enclosed area such as in a cabinet or on bookshelves? Heat can build up in such enclosed areas. Are components of your computer system placed side by side very close to each other? This can affect the operation of side cooling vents. Does the exterior of any of your equipment feel warm to the touch? If so, you may be risking equipment damage.

Heat is generated by all electrical components, and if not adequately dissipated can cause irregular operation and finally failure. An example is the PE box. We all know that it has a built in very noisy cooling fan and should thus be free of heat problems. Last Summer, on a hot humid day (indoor temperature over 80F) I experienced irregular disk drive operation. I assumed the problem was with the disk controler card, since both my internal and external drives acted wierd. By inserting some paper along the open back of the PE box I was able to redirect all incoming air around the disk controler card. This procedure solved my problems, but it illustrate the fact that under some circumstances the PE box fan doesn't provide enough cooling.

WHAT TO DO ABOUT HEAT- Besides the obvious precaution of assuring free air access to the bottom, sides and top of each piece of equipment, I believe that supplemental cooling fans should be used in any sort of permanent compuer instalation. There should be enough air circulation, in my opinion, so that the outside of all equipment feels cool to the touch. The one exception may be the 99/4A console. Consoles frequently feel warm on the top right. However, consoles are

next column please

almost always used out in an open area (not tucked away on a shelf) and seem to me to be quite reliable in spite of this heat.

Radio Shack sells cooling fans for either external use or for mounting internally inside a piece of equipment. These fans are quiet (much quieter than the PE box fan), low power (10 watts), and move lots of air. A 3.5 inch fan lists for $14.95 while a 4 inch fan costs $15.95. I now have two of these fans cooling my equipment, one for the PE box and monitor and the other for the printer and external disk drive. Now none of this equipment feels the slightest bit warm on the outside. I feel that the relatively small pruchase and operating cost of these fans is a good investment when you consider that they are protecting several hundred dollars worth of equipment. It is probably too bad I wasn't using supplemental cooling fans when my old GEMINI printer burned out. Maybe you can learn from my mistakes.

Charles Good

P.S. See the advertisments on the last page of this newsletter for good prices on small fans and a plug box with surge surpresser

TIPS FROM THE TIGERCUB

#31

TIGERCUB SOFTWARE
156 Collingwood Ave.
Columbus, OH 43213

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Tips from the Tigercub Vol. 2, another diskfull, complete contents of Nos. 15 through 24, over 60 files and programs, also just $15 postpaid. Or, both for $27 postpaid.
Nuts & Bolts (No. 1), a full disk of 180 Extended Basic utility subprograms in merge format, ready to merge into your own programs. Plus the Tigercub Menuloader, a tutorial on using subprograms, and 5 pages of documentation with an example of the use of each subprogram. All for just $19.95 postpaid.
Nuts & Bolts No. 2, another full disk of 180 utility subprograms in merge format, all new and fully compatible with the last, and with 18 pages of documentation and examples. Also $19.95 postpaid, or both Nuts Bolts disks for $37 postpaid.
Tigercub Full Disk Collections, just $12 postpaid! Each of these contains either 5 or 6 of my regular 45 catalog programs, and the remaining disk space has been filled with some of the best public domain programs of the same category. I am NOT selling public domain programs - my own programs on these disks are greatly discounted from their usual price, and the public domain is a FREE bonus!
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PROGRAMMER'S UTILITIES
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BRAIN TEASERS
BRAIN BUSTERS
MANEUVERING GAMES
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REFLEX AND CONCENTRATION
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MORE GAMES
WORD GAMES
ELEMENTARY MATH
MIDDLE/HIGH SCHOOL MATH
VOCABULARY AND READING
MUSICAL EDUCATION
KALEIDOSCOPES AND DISPLAYS
For descriptions of these send a dollar for my catalog!

A few people have asked for a program that they could use to encode personal messages on a BBS. considering the current legal threats to BBS's, I doubt that a SysOp will allow coded messages, but here is a coder/decoder to create code that should be quite difficult to crack. First we need another of those programs that write a program -

```
100 !CODEPRINT by Jim Peterson - creates a random code in a MERGE format program CODESTRING to be MERGEd into CODEMAKER
110 FOR J=1 TO 254 :: M$=M$&CHR$(J):: NEXT J
120 FOR J=1 TO 254 :: RANDOMIZE :: I=INT(RND*LEN(M$)+1):: C$=C$&SEG$(M$,I,1):: M$=SEG$(M$,1,I-1)&SEG$(M$,I+1,LEN(M$)):: NEXT J
130 OPEN #1:"DSK1.CODESTRING",VARIABLE 163,OUTPUT :: PRINT #1:CHR$(8)&CHR$(11)&"C0"&CHR$(198)&CHR$(199)&CHR$(127)&SEG$(C$,1,127)&CHR$(8)
140 PRINT #1:CHR$(8)&CHR$(2)&"C28"&CHR$(198)&CHR$(199)&CHR$(127)&SEG$(C$,128,127)&CHR$(8)
150 PRINT #1:CHR$(8)&CHR$(3)&"C8"&CHR$(198)&"C0"&CHR$(184)&"C28"&CHR$(8):: PRINT #1:CHR$(255)&CHR$(255):: CLOSE #1 :: END
```

And now the coder/decoder -

```
100 !TIGERCUB CODEMAKER written by Jim Peterson
110 !The MERGE format program CODESTRING created by the program CODEPRINT must be MERGEd into lines 1-3 of this program
120 DIM A$(254):: DISPLAY AT(3,6)ERASE ALL:"TIGERCUB CODEMAKER" :: DISPLAY AT(12,1):"Do you want to": :"(1)Encode":"(2)Decode"
130 CALL KEY(0,K,ST):: IF K=49 THEN 180 ELSE IF K=50 THEN 290 ELSE 130
140 OPEN #1:"DSK1.CODE",VARIABLE 254,OUTPUT
150 DISPLAY AT(5,6)ERASE ALL:"Type message in segments of":"not more than 254 characters":"and Enter. When done, type"
160 DISPLAY AT(9,1):"END and Enter. Type slowly":"to avoid skipped characters.":"Backspace with FCTN S to":"correct.": :"Press any key"
170 CALL KEY(0,K,ST):: IF ST=0 THEN 170
180 CALL CLEAR :: CALL LONGACCEPT(6,M$):: IF M$="END" THEN 200
190 DISPLAY AT(20,1):"WAIT, PLEASE - ENCODING"
200 FOR J=1 TO LEN(M$)
210 A$(ASC(SEG$(C$,J,1)))=SEG$(M$,J,1)
220 NEXT J
230 FOR J=1 TO 254 :: RANDOMIZE :: I=INT(RND*LEN(M$)+1):: C$=C$&SEG$(M$,I,1):: M$=SEG$(M$,1,I-1)&SEG$(M$,I+1,LEN(M$)):: NEXT J
240 OPEN #1:"DSK1.CODESTRING",VARIABLE 163,OUTPUT :: PRINT #1:CHR$(8)&CHR$(11)&"C0"&CHR$(198)&CHR$(199)&CHR$(127)&SEG$(C$,1,127)&CHR$(8)
250 PRINT #1:CHR$(8)&CHR$(2)&"C28"&CHR$(198)&CHR$(199)&CHR$(127)&SEG$(C$,128,127)&CHR$(8)
260 PRINT #1:CHR$(8)&CHR$(3)&"C8"&CHR$(198)&"C0"&CHR$(184)&"C28"&CHR$(8):: PRINT #1:CHR$(255)&CHR$(255):: CLOSE #1 :: END

And now the coder/decoder -
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110 !The MERGE format program CODESTRING created by the program CODEPRINT must be MERGEd into lines 1-3 of this program
120 DIM A$(254):: DISPLAY AT(3,6)ERASE ALL:"TIGERCUB CODEMAKER" :: DISPLAY AT(12,1):"Do you want to": :"(1)Encode":"(2)Decode"
130 CALL KEY(0,K,ST):: IF K=49 THEN 180 ELSE IF K=50 THEN 290 ELSE 130
140 OPEN #1:"DSK1.CODE",VARIABLE 254,OUTPUT
150 DISPLAY AT(5,6)ERASE ALL:"Type message in segments of":"not more than 254 characters":"and Enter. When done, type"
160 DISPLAY AT(9,1):"END and Enter. Type slowly":"to avoid skipped characters.":"Backspace with FCTN S to":"correct.": :"Press any key"
170 CALL KEY(0,K,ST):: IF ST=0 THEN 170
180 CALL CLEAR :: CALL LONGACCEPT(6,M$):: IF M$="END" THEN 200
190 DISPLAY AT(20,1):"WAIT, PLEASE - ENCODING"
200 FOR J=1 TO LEN(M$)
210 A$(ASC(SEG$(C$,J,1)))=SEG$(M$,J,1)
220 NEXT J
230 FOR J=1 TO 254 :: RANDOMIZE
240 IF A$(J)="" THEN A$(J)=CHR$(INT(26*RND+65))
250 CODE$=CODE$&A$(J)
260 NEXT J :: PRINT CODE$
270 PRINT #1:CODE$ :: CODE$="" :: FOR J=1 TO 254 :: A$(J)="" :: NEXT J :: GOTO 180
280 CLOSE #1 :: END
290 OPEN #1:"DSK1.CODE",VARIABLE 254,INPUT :: CALL CLEAR :: DISPLAY AT(12,10):"DECODING"
300 LINPUT #1:CODE$ :: FOR J=1 TO 254 :: M$=M$&SEG$(CODE$,ASC(SEG$(C$,J,1)),1):: NEXT J :: PRINT M$;: M$=""
310 IF EOF(1)<>1 THEN 300 :: CLOSE #1 :: END
320 SUB LONGACCEPT(L,M$):: X=0 :: IF L<>0 THEN R=L ELSE R=1
330 M$="" :: C=1 :: CH=140 :: CALL CHAR(140,RPT$("0",14)&"FF")
340 CALL HCHAR(R,C,CH):: CH=CH+5+(CH=168)*28 :: CALL KEY(0,K,ST):: IF ST<1 THEN 340
350 IF K<>8 THEN 370 :: I=I-1 :: C=C-1 :: IF C=2 THEN C=30 :: R=R-1
360 M$=SEG$(M$,1,LEN(M$)-1):: GOTO 340
370 IF K=13 THEN 410
380 I=I+1 :: M$=M$&CHR$(K):: CALL HCHAR(R,C,K):: IF I=254 THEN 410
390 C=C+1 :: IF C=31 THEN C=3 :: R=R+1 :: IF R=25 THEN CALL CLEAR :: R=1
400 GOTO 340
410 R=0 :: SUBEND

Here is a simple little game I call Cover-Up. Use the #1 joystick, try to cover the white square with the black square. Press the fire button to speed up, release it to slow down.

```
100 CALL CLEAR :: CALL CHAR(96,RPT$("F",64)):: CALL SPRITE(#1,96,5,92,124):: CALL MAGNIFY(4):: CALL SPRITE(#2,96,16,180,188)
110 I=INT(28*RND)-INT(28*RND):: I=INT(28*RND)-INT(28*RND):: CALL MOTION(#2,I,Y):: T=T+1 :: IF T=250 THEN 300
120 CALL JOYSPEED(1,1):: CALL COINC(#1,#2,8,A):: IF A=-1 THEN 130 ELSE 110
130 Z=Z+1 :: DISPLAY AT(1,1):Z :: CALL SOUND(-50,500,5):: GOTO 120
300 CALL DELSPRITE(ALL):: DISPLAY AT(12,5):"YOUR SCORE IS "&STR$(Z):: DISPLAY AT(20,1):"PRESS ENTER TO PLAY AGAIN"
310 CALL KEY(0,K,S):: IF S=0 OR K<>13 THEN 310 :: T,Z=0 :: GOTO 110
21110 SUB JOYSPEED(N,A,,,):: CALL JOYST(N,X,Y):: CALL KEY(N,K,ST):: S=S+K/9-1 :: S=S+ABS(S)*0:: IF S>30 THEN S=30
21111 CALL MOTION(#A,-(Y=S),X=S):: SUBEND
```

For a one-handed BREAK, if you can't reach FCTN and 4, try FCTN with J and the space bar together.

If you like to call BBS's, try the TI-IBS Spirit of 99 BBS in Columbus, Ohio on (614)451-4188 and leave me a "hello!"

Probably useless info - holding down FCTN and CTRL together and typing 1, 2, 3 and 5 will give ASCII codes 145, 151, 133 and 148, which are the codes obtained from CTRL Q, W, E and T, the keys diagonally below the 1, 2, 3 and 5.

Occasionally someone sends me a program they have keyed in from my newsletter, and asks why it won't run, so I wrote this routine to help find the errors. It is also useful to check whether two copies of a program are identical, but only if they have not been resequenced.

```
100 !CHECKER by Jim Peterson - to compare two programs and list all differing lines to the printer
110 DISPLAY AT(12,1)ERASE ALL:"1st program DSK/filename?":"DSK" :: ACCEPT AT(13,1):F$
120 DISPLAY AT(12,1)ERASE ALL:"2nd program DSK/filename?":"DSK" :: ACCEPT AT(13,4):F$
130 OPEN #1:"DSK"&F$,INPUT :: DIM M$(500),CH(500):: OPEN #2:"PIO",VARIABLE 255 :: PRINT #2:CHR$(15)
140 I=I+1 :: LINPUT #1:M$(I) :: M$(I)=M$(I)&" " :: IF EOF(1)<>1 THEN 140 :: CLOSE #1 :: OPEN #1:"DSK"&F$,INPUT
150 IF EOF(1)=1 THEN 230 :: LINPUT #1:I$ :: I$=I$&" "
160 FOR Y=1 TO X
170 IF I$=M$(Y)THEN CH(Y)=1 :: GOTO 150
180 NEXT Y
190 P2=POS(I$," ",1):: P2$=SEG$(I$,1,P2-1)
200 FOR Y=2 TO X :: P1=POS(M$(Y)," ",1):: P1$=SEG$(M$(Y),1,P1-1)
210 IF P2$=P1$ THEN PRINT #2:"1st program = ";M$(Y):"2nd program = ";I$ :: CH(Y)=1 :: GOTO 150
220 NEXT Y :: PRINT #2:"2nd program = ";I$ :: GOTO 150
230 FOR J=1 TO X :: IF CH(J)=0 THEN PRINT #2:"1st program = ";M$(J)
240 NEXT J
250 CLOSE #1 :: CLOSE #2

Here's a great idea that was printed and reprinted in several newsletters -
At the beginning of a program that will run only in Basic, add the lines -
1 IF 1=0 THEN (first line of program)
2 PRINT "YOU ARE IN EXTENDED BASIC":"THIS PROGRAM RUNS ONLY IN BASIC"
3 STOP
The idea is that PI is a function in XBasic with the value of pi, but is just a variable name in Basic with an undefined value of 0.
The trouble is, it doesn't work! If PI is keyed in from Basic and saved, it is saved in token format as a variable name, and when loaded back into XBasic is still just a variable name. And if PI is saved from XBasic, it is tokenized as a function, loads back into Basic as an unrecognized function and crashes! Can anyone come up with a way around this?
The above is the answer to the Challenge in Tips #30. Lines 100 and 110 were keyed in and saved from Basic, and loaded back into XBasic, then lines 120 and 130 were keyed in.

Here is a handy PEEK that hasn't been published as widely as most of them -
100 CALL INIT
110 CALL PEEK(8192,X)!Thanks to Dale Loftis in the Orange County UG newsletter!
120 PRINT X !If X=32 you are in Extended Basic; if X=165 you are in Basic with the Editor Assembler or MiniMemory module inserted.

And another 3-D sprite demo, just to make all the Apple polishers jealous. See if you can figure out how it works.

```
100 CALL CLEAR :: CALL SCREEN(5):: CALL CHAR(128,RPT$("F",64)):: CALL MAGNIFY(4):: FOR S=5 TO 9 :: CALL COLOR(S,16,1):: NEXT S
110 DISPLAY AT(3,3):"TIGERCUB SPRITE SHUFFLE" !by Jim Peterson
120 DATA 78,116,2,75,121,7,69,124,11,78,115,16
130 FOR J=5 TO 8 :: READ P(J),P(J,2),L(J):: CALL SPRITE(#J,128,L(J),P(J,1),P(J,2)) :: NEXT J :: M=45
140 DATA 5,6,7,8,8,5,6,7,7,8,5,6,6,7,8,5
150 RESTORE 140 :: FOR Y=5 TO 8 :: READ A,B,C,D
160 FOR J=1 TO M :: CALL LOCATE(#A,P(A,1)-J,P(A,2),#B,P(B,1),P(B,2)-J,#C,P(C,1)+J,P(C,2),#D,P(D,1),P(D,2)+J):: M=M-9 :: NEXT J :: GOSUB 180
170 NEXT Y :: GOTO 150
180 FOR J=5 TO 7 :: CALL POSITION(#J,P(J+1,1),P(J+1,2)):: NEXT J :: CALL POSITION(#8,P(5,1),P(5,2))
190 T=L(8):: L(8)=L(7):: L(7)=L(6):: L(6)=L(5):: L(5)=T
200 FOR J=5 TO 8 :: CALL SPRITE(#J-4,128,L(J),P(J,1),P(J,2)):: NEXT J
210 FOR J=5 TO 8 :: CALL SPRITE(#J,128,L(J),P(J,1),P(J,2)):: NEXT J :: CALL DELSPRITE(#1,#2,#3,#4):: RETURN
```

Do you need some really REAL BIG letters on the screen? Just type your letter at the beep.

```
100 DIM X$(96):: CALL CLEAR :: FOR CH=33 TO 89 STEP 8 :: FOR A=0 TO 7 !REAL BIG LETTERS by Jim Peterson
110 CALL CHARPAT(CH+A,X$(CH+A-32)):: CALL CHAR(CH+A,"0"):: L$=L$&RPT$(CHR$(CH+A),3):: NEXT A
120 FOR T=1 TO 3 :: R=R+1 :: DISPLAY AT(R,4):L$ :: NEXT T :: L$="" :: NEXT CH
130 CH$(1)=RPT$("0",16):: CH$(2)=RPT$("F",16)
140 CALL SOUND(150,500,0)
150 CALL KEY(0,CH,S):: IF S=0 OR CH>96 THEN 150
160 CALL HEX_BIN(I$(CH-32),B$):: FOR J=0 TO 64 :: CALL CHAR(J+32,CH$(VAL(SEG$(B$,J,1))+1))
170 NEXT J :: GOTO 140
180 SUB HEX_BIN(H$,B$):: HX$="0123456789ABCDEF" :: BN$="0000010100110111100010011010101111001101111011111111" :: FOR J=LEN(H$) TO 1 STEP -1 :: X$=SEG$(H$,J,1)
200 X=POS(HX$,X$,1)-1 :: T$=SEG$(B$,X*4+1,4)&T$ :: NEXT J :: B$=T$ :: T$="" :: SUBEND
```

Thought for the day. The excuses for piracy are exactly the same as the excuses for shoplifting, but you probably won't have to tell them to the judge - in this world, at least.

And that is almost

MEMORY FULL

Jim Peterson

NUMBER - WORD CONVERSION PROGRAM

The following program, written by Mel Nomina, converts a number into its equivalent in words. The program asks you to input a number, such as 129.65, and then prints the word equivalent on the screen and printer. Sample printouts are shown immediately below. A somewhat similar program was published recently in Micropendium.

```
One Hundred Twenty Five &.65/100
Thirty Five &.95/100
```

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10 ! This is a useful utility you can use to,teach children or merge in a check
 writting program.
20 ! I hope to write a check writting program by spring, using this program.
30 !
40 ! ************************
50 !FILE "1K/CHECK"  12/23/85
60 CALL CLEAR
70 ! CHECK PRINTER PROGRAM
80 ! BY MELVIN E. NOMINA
90 ! ***** 12-1985 *****
100 OPEN #1:"P1O"
110 M1$="One " :: M2$="Two " :: M3$="Three " :: M4$="Four " :: M5$="Five " :: M6
$="Six " :: M7$="Seven " :: M8$="Eight " :: M9$="Nine " :: M10$="Ten "
120 M11$="Eleven " :: M12$="Twelve " :: M13$="Thirteen " :: M14$="Fourteen " ::
M15$="Fifteen " :: M16$="Sixteen " :: M17$="Seventeen "
130 M18$="Eighteen " :: M19$="Nineteen " :: M19$="Nineteen " :: M20$="Twenty " :
: M30$="Thirty " :: M40$="Fourty " :: M50$="Fifty " :: M60$="Sixty "
140 M70$="Seventy " :: M80$="Eighty " :: M100$="Hundred " :: M1K$="One Thousand
" :: M2K$="Two Thousand " :: M3K$="Three Thousand " :: M4K$="Four Thousand "
150 M5K$="Five Thousand " :: M6K$="Six Thousand " :: M7K$="Seven Thousand " :: M
8K$="Eight Thousand " :: M9K$="Nine Thousand "
480 !***** INPUT NUMBER *****
490 INPUT "INPUT A NUMBER ":A$
500 D1$="" :: D2$="" :: D3$="" :: D4$="" :: C$="" :: CC$=""
510 A=LEN(A$)
520 S$=A$
530 V=VAL(A$)
540 ! ***** COUNT PLACE BEFORE DECIMAL POINT & SORT CENTS STRING ****
550 FOR X=1 TO A
560 IF SEG$(S$,X,1)="." THEN 600
570 NEXT X
580 S$=S$&".00"
590 GOTO 610
600 S$=S$&"00"
610 C$=SEG$(S$,X,3)
620 IF C$=".00" THEN C$=".No"
630 CC$="&"&""&C$&"/100"
635 IF X=1 THEN D1$="NO DOLLARS " :: GOTO 1790
640 X=X-1
650 ON X GOTO 1230,1270,1390,1570
690 ! ***** ONE DOLLAR NUMBER *****
700 IF M$="0" THEN D1$="" :: RETURN :: IF M$="1" THEN D1$=M1$ :: RETURN
710 IF M$="1" THEN D1$=M10$ :: RETURN
720 IF M$="2" THEN D1$=M20$ :: RETURN
730 IF M$="3" THEN D1$=M3$ :: RETURN
740 IF M$="4" THEN D1$=M4$ :: RETURN
750 IF M$="5" THEN D1$=M5$ :: RETURN
760 IF M$="6" THEN D1$=M6$ :: RETURN
770 IF M$="7" THEN D1$=M7$ :: RETURN
780 IF M$="8" THEN D1$=M8$ :: RETURN
790 IF M$="9" THEN D1$=M9$ :: GOTO 1250
800 ! ***** TEN DOLLAR NUMBER *****
810 IF M$="10" THEN D2$=M10$ :: RETURN
820 IF M$="11" THEN D2$=M11$ :: RETURN
830 IF M$="12" THEN D2$=M12$ :: RETURN
840 IF M$="13" THEN D2$=M13$ :: RETURN
850 IF M$="14" THEN D2$=M14$ :: RETURN
860 IF M$="15" THEN D2$=M15$ :: RETURN
870 IF M$="16" THEN D2$=M16$ :: RETURN
880 IF M$="17" THEN D2$=M17$ :: RETURN
890 IF M$="18" THEN D2$=M18$ :: RETURN
900 IF M$="19" THEN D2$=M19$ :: RETURN
910 IF M$="20" THEN D2$=M20$ :: RETURN
920 IF M$="2" THEN D2$=M20$ :: RETURN
930 IF M$="3" THEN D2$=M30$ :: RETURN
940 IF M$="4" THEN D2$=M40$ :: RETURN
950 IF M$="5" THEN D2$=M50$ :: RETURN
960 IF M$="6" THEN D2$=M60$ :: RETURN
970 IF M$="7" THEN D2$=M70$ :: RETURN
980 IF M$="8" THEN D2$=M80$ :: RETURN
990 IF M$="9" THEN D2$=M90$ :: RETURN
1000 IF X=2 THEN 1790
1010 ! ***** HUNDRED DOLLAR NUMBER *****
1020 IF M$="0" THEN RETURN
1021 IF M$="1" THEN D3$=M1$&M100$ :: RETURN
1030 IF M$="2" THEN D3$=M2$&M100$ :: RETURN
1040 IF M$="3" THEN D3$=M3$&M100$ :: RETURN
1050 IF M$="4" THEN D3$=M4$&M100$ :: RETURN
1060 IF M$="5" THEN D3$=M5$&M100$ :: RETURN
1070 IF M$="6" THEN D3$=M6$&M100$ :: RETURN
1080 IF M$="7" THEN D3$=M7$&M100$ :: RETURN
1090 IF M$="8" THEN D3$=M8$&M100$ :: RETURN
1100 IF M$="9" THEN D3$=M9$&M100$ :: RETURN
1110 ! ***** ONE THOUSAND DOLLAR NUMBER *****
1120 IF M$="1" THEN D4$=M1K$ :: RETURN
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1130 IF M$="2" THEN D4$=M2K$ :: RETURN
1140 IF M$="3" THEN D4$=M3K$ :: RETURN
1150 IF M$="4" THEN D4$=M4K$ :: RETURN
1160 IF M$="5" THEN D4$=M5K$ :: RETURN
1170 IF M$="6" THEN D4$=M6K$ :: RETURN
1180 IF M$="7" THEN D4$=M7K$ :: RETURN
1190 IF M$="8" THEN D4$=M8K$ :: RETURN
1200 IF M$="9" THEN D4$=M9K$ :: RETURN
1210 IF X=4 THEN 1740 ELSE 1540
1220 !***** ONE NUMER SORT  1 TO 9 *****
1230 M$=SEG$(A$,1,1)
1231 ! *******635 TO 850
1240 GOSUB 700
1250 GOTO 1790
1260 ! ***** FIRST TWO NUMER SORT 10 TO 20 *****
1270 IF V>20 THEN 1330
1280 ! ***** IF V>20 THEN GOES TO FIRST OF TWO NUMBER SORT *****
1290 M$=SEG$(A$,1,2)
1300 GOSUB 810
1310 GOTO 1790
1320 ! ***** FIRST OF TWO NUMBER SORT 20 TO 90 *****
1330 M$=SEG$(A$,1,1)
1340 GOSUB 920
1350 ! ***** SECOND OF TWO NUMBER SORT 1  TO 9  *****
1360 M$=SEG$(A$,2,1)
1370 GOSUB 700
1380 GOTO 1790
1390 !***** FIRST  NUMBER OF THREE SORT 100 TO 900 *****
1400 M$=SEG$(A$,1,1)
1410 GOSUB 1020
1420 ! ***** SECOND NUBMER OF THREE SORT 20 TO 90 *****
1430 M$=SEG$(A$,2,2)
1440 V=VAL(M$)
1450 IF V>20 THEN 1510
1460 ! ***** IF V>20 THEN GOES FOR 20 TO 90 SORT *****
1470 GOSUB 810
1480 ! ***** IF V<20 THEN IT'S FINISHED *****
1490 IF V<20 THEN 1790
1500 ! ***** FIRST OF TWO NUMBER SORT 20 TO 90 *****
1510 M$=SEG$(A$,2,1)
1520 GOSUB 810
1530 ! ***** LAST OF TWO NUMBER SORT 1  TO 9  *****
1540 M$=SEG$(A$,3,1):: PRINT M$
1550 GOSUB 700
1560 GOTO 1790
1570 !***** FIRST  NUMBER OF FOUR  SORT 1000 TO 9000 *****
1580 M$=SEG$(A$,1,1)
1590 GOSUB 1120
1600 !***** FIRST  NUMBER OF FOUR  SORT 100 TO 900 *****
1610 M$=SEG$(A$,2,1)
1620 GOSUB 1020
1630 ! ***** SECOND NUBMER OF FOUR  SORT 20 TO 90 *****
1640 M$=SEG$(A$,3,2)
1650 V=VAL(M$)
1660 IF V>20 THEN 1710
1670 ! ***** IF V>20 THEN GOES FOR 20 TO 90 SORT *****
1680 GOSUB 810
1690 ! ***** IF V<20 THEN IT'S FINISHED *****
1700 IF V<20 THEN 1790
1710 ! ***** FIRST OF TWO NUMBER SORT 20 TO 90 *****
1720 M$=SEG$(A$,3,1)
1730 GOSUB 810
1740 ! ***** LAST OF TWO NUMBER SORT 1  TO 9  *****
1750 M$=SEG$(A$,4,1)
1760 GOSUB 700
1770 GOTO 1790
1780 ! ***** SET PRINTER UP *****
1790 PRINT #1:CHR$(20);CHR$(27);"6";
1800 ON X GOTO 1810,1840,1870,1870
1810 PRINT #1:CHR$(18);CHR$(14);D1$&CC$
1820 PRINT "$  ";D1$&CC$
1830 GOTO 1910
1840 PRINT #1:CHR$(18);CHR$(14);D2$&D1$&CC$
1850 PRINT "$  ";D2$&D1$&CC$
1860 GOTO 1910
1870 PRINT #1:CHR$(18);CHR$(14);D4$&D3$&D2$&D1$;
1880 PRINT #1:CHR$(20);CHR$(27);"E";CC$
1890 PRINT "$ ";D4$&D3$&D2$&D1$&CC$
1900 GOTO 1910
1910 GOTO 490
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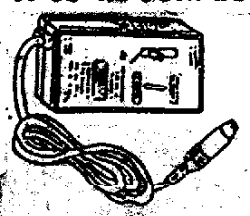
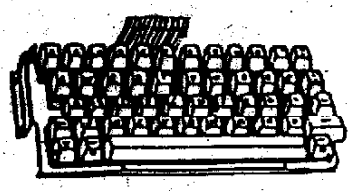
The advertisments below appeared in the February 1986 issue of Computer Shopper. They seem of particular interest to TI/994A users because of the low prices, or the nature of the product.

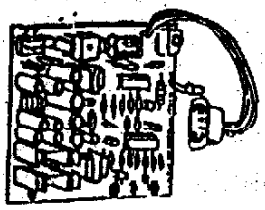
TI 99-4A SURPLUS



SOUND & VIDEO MODULATOR
TI WDM1381-1 — can be used with all video sources. Built-in A-B switch. Channel 3 or 4 output. Requires 12VDC power $3.50

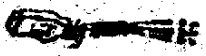


KEYBOARD
PN 900181 — 48 keys. Measures 4"x9". Terminates to a 15 pin connector $3.75



SWITCHING POWER SUPPLY
INPUT: 14 VAC to 25.5 VAC.
OUTPUT: +12VDC @ 350MA.
+5VDC @ 1.2AMP.

WALL PLUG ADAPTER
TN-21 — used with the above power supply. Output 21VAC @ 45VA.
TN-21 .....$3.50 ea or 10/$19.95



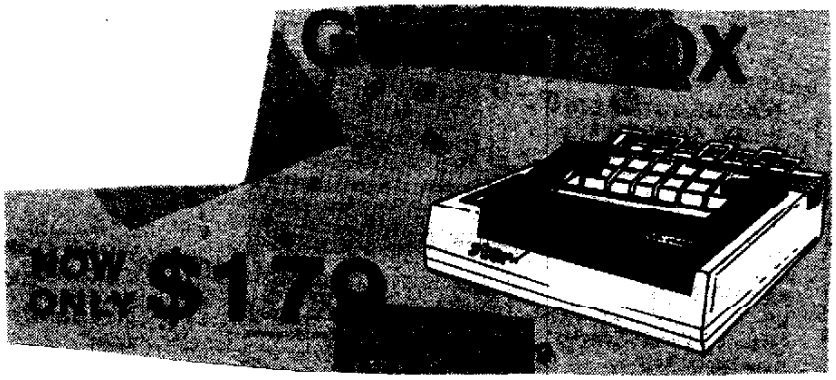
CASSETTE INTERFACE CABLE
CIC-99 — has DB-9 connector on one side by 3 RCA plastic jacks on the other end. $1.50 ea or 10/$12.50

LOJIR ELECTRONICS CORP.
13933 N. CENTRAL EXPRESSWAY
SUITE 212
DALLAS, TX 75243
214-234-8032 — 214-234-8056

5" muffin fan 120V AC (uninstalled equipment)
$4.95
Sprite fan 115V 3½"
$4.00

$14.00
six outlet
AC SURGE SUPPRESSOR

WOLFF COMPUTER & ELECTRONICS
(214) 423-8097
901 E. Plano Pkwy #117
Plano, Texas 75074
MON-FRI 10am to 7pm SAT 10am to 6pm



Midwest Micro-Peripherals
St. Paris, Ohio
800-321-7731 (in Ohio)
800-423-8215 (outside Ohio)