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Electronic Manufacturing
Technical Design and Development
Computer System Technology

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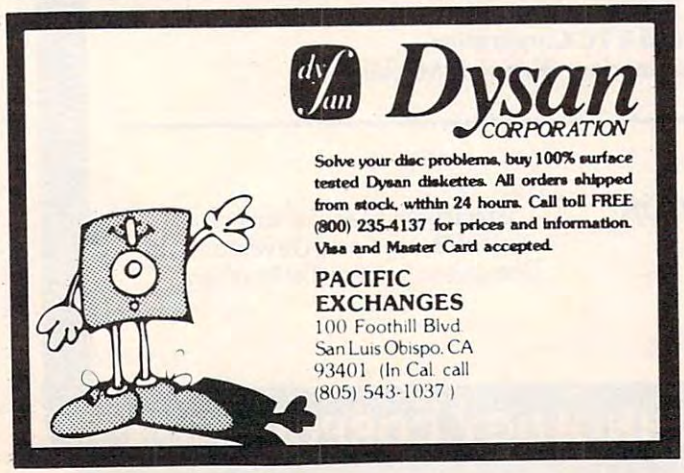
UPGRADE

```
55   183 USR
56   184 FRE
57   185 POS
58   186 SQR
59   187 RND
60   188 LOG
61   189 EXP
62   190 COS
63   191 SIN
64   192 TAN
65   193 ATN
66   194 PEEK
67   195 LEN
68   196 STR$
69   197 VAL
70   198 ASC
71   199 CHR$
72   200 LEFT$
73   201 RIGHT$
74   202 MID$
75   203 GO
76   204 NEXT WITHOUT FOR
77   205 SYNTAX
78   206 RETURN WITHOUT GOSUB
79   207 OUT OF DATA
80   208 ILLEGAL QUANTITY
81   209 OVERFLOW
82   210 OUT OF MEMORY
83   211 UNDEF'D STATEMENT
84   212 BAD SUBSCRIPT
85   213 REDIM'D ARRAY
86   214 DIVISION BY ZERO
87   215 ILLEGAL DIRECT
88   216 TYPE MISMATCH
89   217 STRING TOO LONG
90   218 FILE DATA
91   219 FORMULA TOO COMPLEX
92   220 CAN'T CONTINUE
93   221 UNDEF'D FUNCTION
94   222  ERROR IN
```

BASIC 4

```
55   183 USR
56   184 FRE
57   185 POS
58   186 SQR
59   187 RND
60   188 LOG
61   189 EXP
62   190 COS
63   191 SIN
64   192 TAN
65   193 ATN
66   194 PEEK
67   195 LEN
68   196 STR$
69   197 VAL
70   198 ASC
71   199 CHR$
72   200 LEFT$
73   201 RIGHT$
74   202 MID$
75   203 GO
76   204 CONCAT
77   205 DOPEN
78   206 DCLOSE
79   207 RECORD
80   208 HEADER
81   209 COLLECT
82   210 BACKUP
83   211 COPY
84   212 APPEND
85   213 DSAVE
86   214 DLOAD
87   215 CATALOG
88   216 RENAME
89   217 SCRATCH
90   218 DIRECTORY
91   219 NEXT WITHOUT FOR
92   220 SYNTAX
93   221 RETURN WITHOUT GOSUB
94   222 OUT OF DATA
95   223 ILLEGAL QUANTITY
96   224 OVERFLOW
97   225 OUT OF MEMORY
98   226 UNDEF'D STATEMENT
99   227 BAD SUBSCRIPT
100  228 REDIM'D ARRAY
101  229 DIVISION BY ZERO
102  230 ILLEGAL DIRECT
103  231 TYPE MISMATCH
104  232 STRING TOO LONG
105  233 FILE DATA
106  234 FORMULA TOO COMPLEX
107  235 CAN'T CONTINUE
108  236 UNDEF'D FUNCTION
109  237  ERROR IN
```

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Screen Save Routine

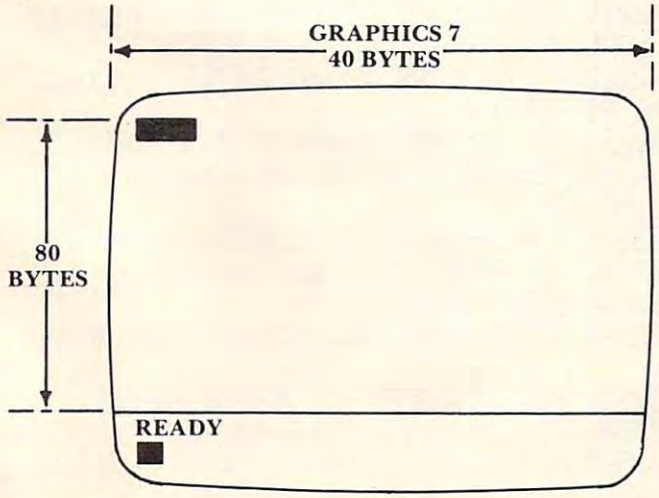
Joseph Trem
Garfield Heights, OH

A while back, **COMPUTE!** published an excellent article for drawing pictures entitled "SUPER CUBE" (**COMPUTE!** #11). Pictures are drawn to look 3-dimensional. After playing with this program, some very interesting pictures developed... all to be lost when the computer was turned off! Gee, it sure would be nice to save those Rembrandts!

The following utility program can be appended to the end of your favorite drawing programs and will enable you to save those Rembrandts. A sample drawing is included at the beginning of this utility.

The Atari computer is fascinating indeed. The more you delve, the more intriguing it becomes. This program is based on three screen-related memory addresses – 87, 88, & 89. Location 87 contains the graphics mode presently in use. Type "GRAPHICS 7", then type "PRINT PEEK(87)". The computer will respond with "7". Locations 88 and 89 store the starting addresses of screen memory. 88 contains the low byte and 89 contains the high byte. Again, type "GRAPHICS 7", then type "PRINT PEEK(88) + PEEK(89)*256". This will return the memory starting address for Graphics 7. Note that each computer may return a different number depending on the memory size of the machine. Now type "POKE(memory start), 255". This will light up one full byte at the top left corner of the screen (Figure 1).

Figure 1.



Type "POKE(memory start+40,255", and this will light up the next full byte directly under the first byte. Knowing this, it is possible to keep track of every byte on the screen. There are 40 bytes horizontally and 80 bytes vertically in Graphics 7. In the utility program, line 33240 locates the starting address of your picture. Lines 32125 and 32225 scan and set screen memory locations. You may adapt these lines to any graphics mode using the chart provided. For example, if you happen to be using graphics 5, change the "40*80" in those lines to "20*40"

	HORIZONTAL BYTES	VERTICAL BYTES
GR.8	40	160
GR.7	40	80
GR.6	20	80
GR.5	20	40
GR.4	10	40
GR.3	10	20
GR.2	20	10
GR.1	20	20
GR.0 (full screen)	40	24

After running this program, you may want to append only the utility part to your favorite drawing program. Here's how to do it. First, make sure your drawing program does not exceed line 30999. Now type LIST"C:",31000,32240 or LIST "D:filename", 31000,32240. This will save only lines 31000 through 32240. When completed type NEW and load your drawing program (e.g. SUPER CUBE). Now load your utility program back in. This is done by typing ENTER"C:" or ENTER "D:filename". This will append your utility to the end of any drawing program.

Some programs may have to be modified slightly, but with a little effort you may find it worth it. Run your program. Draw your masterpiece. When you are satisfied with your creation, press the BREAK key and type "GOTO 31000". This will initialize the save and load routine. Then sit back, relax and surprise someone with a genuine work of art worthy only of the great masters.

10	Initializes SCREEN SAVE ROUTINE
40-195	Draws sample picture (e.g. Space game playfield)
200	Reinitializes menu after drawing
30000	Sets GR.2 & title
31000	Opens IOCB for keyboard
32000 to 32060	Prints menu. Gets keyboard input and directs to appropriate line.
32100 to 32103	Prints save menu. Gets keyboard input and directs to appropriate line.

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32105 to 32208	Prints disk instructions.
32110 to 32210	Prints cassette instructions.
32200	Prints load menu.
32122	Stores graphics mode and color register data.
32125	Stores screen RAM data.
32222	Reads graphics mode and color register data and pokes it into correct location.
32225	Reads screen RAM data and pokes into correct locations.
32240	Determines start address of screen.

```
10 GOTO 30000
40 GRAPHICS 7:SETCOLOR 0,6,6:REM %SET GR
APHICS 7 MODE
60 INC=49:CO=1:COLOR 1
65 INC=INC+0.05
70 X=SIN(INC)%20:Y=COS(INC)%20
75 PLOT X+80,Y+35:SOUND 1,X+50,10,8
80 CO=CO+1:IF CO<130 THEN 65
100 CO=1
110 COLOR 3
130 INC=INC+0.05
140 X=SIN(INC+1)%30:Y=COS(INC)%30
145 IF CO>49 AND CO<70 THEN 160
150 COLOR 2:PLOT X+80,Y+35:SOUND 1,X+50,
6,8
155 COLOR 3:PLOT X+81,Y+38:COLOR 1:PLOT
X+79,Y+32
160 CO=CO+1:IF CO<130 THEN 110
170 COLOR 1:FOR X=1 TO 159:PLOT X,79:DRA
WTO X,79-RND(0)%5:SOUND 1,X,10,8:NEXT X
180 FOR X=1 TO 20:COLOR RND(0)%1+1:PLOT
40,40:DRAWTO RND(0)%10,RND(0)%10:SOUND 1
,X+20,8,8:NEXT X
183 FOR X=120 TO 159:COLOR RND(0)%2+1:PL
OT X,20:DRAWTO X,RND(0)%20:NEXT X
185 COLOR 2:PLOT 130,30:DRAWTO 130,24:DR
AWTO 134,24:DRAWTO 134,30:PLOT 130,27:DR
AWTO 134,27
186 PLOT 142,25:DRAWTO 142,24:DRAWTO 138
,24:DRAWTO 138,30:DRAWTO 142,30:DRAWTO 1
42,29
187 PLOT 150,24:DRAWTO 146,24:DRAWTO 146
,30:DRAWTO 150,30:PLOT 146,27:DRAWTO 149
,27
190 COLOR 2:PLOT 0,0:DRAWTO 159,0:DRAWTO
 159,79:DRAWTO 0,79:DRAWTO 0,0
195 COLOR 1:PLOT 30,70:PLOT 40,10:PLOT 1
40,30:PLOT 150,70:PLOT 105,35:SOUND 1,0,
0,0
200 GOTO 32000
30000 GRAPHICS 2:? #6;" SCREEN SAVE ROUT
INE"
31000 CLOSE #1:OPEN #1,4,0,"K:"
32000 SCRN=32240:GOSUB SCRN:POKE 752,1:?
 "          1...DRAW PICTURE"
32010 ? "          2...SAVE PICTURE"
32020 ? "          3...LOAD PICTURE"
32050 GET #1,A:IF A<49 OR A>51 THEN 3205
0
32060 ON A-48 GOTO 40,32100,32200
32100 ? :? "  SAVE TO  1...CASSETTE?":?
"           2...DISK?"
32101 GET #1,A:IF A<49 OR A>50 THEN 3210
1
32103 ON A-48 GOTO 32110,32105
32105 ? :? "   PLEASE INSERT DISKETTE AN
D PRESS      !RETURN!":GET #1,A:OPEN #2,
8,0,"D:PICTURE":GOTO 32120
32110 ? :? "PLEASE PLACE CLEAN TAPE IN R
ECORDER            AND PRESS !RETURN!"
32115 OPEN #2,8,0,"C:":REM %OPEN FILE TO
 SAVE
32120 ? :? "SIT BACK AND RELAX... !SAVIN
G PICTURE!"
32122 MODE=PEEK(87):PUT #2,MODE:FOR I=0
TO 4:COL=PEEK(708+I):PUT #2,COL:NEXT I
32125 FOR I=SCREEN TO SCREEN+(40%80)-1:L
OC=PEEK(I):PUT #2,LOC:NEXT I:CLOSE #2
32130 GOTO 32000
32200 ? :? "  LOAD TO    1...CASSETTE?":
? "              2...DISK?"
32201 GET #1,A:IF A<49 OR A>50 THEN 3220
1
32203 POKE 752,1
32205 ON A-48 GOTO 32210,32208
32208 ? :? "  PLEASE INSERT DISKETTE AND
 PRESS      !RETURN!":GET #1,A:OPEN #2,4
,0,"D:PICTURE":GOTO 32220
32210 ? " PLEASE INSERT TAPE AND PRESS !
RETURN!"
32215 OPEN #2,4,0,"C:":REM %OPEN FILE TO
 LOAD
32220 ? :? :? "RELAX AND ENJOY... !LOADI
NG PICTURE!"
32222 GET #2,MODE:GRAPHICS MODE:GOSUB SC
RN:FOR I=0 TO 4:GET #2,COL:POKE 708+I,CO
L:NEXT I
32225 FOR I=SCREEN TO SCREEN+(40%80)-1:G
ET #2,LOC:POKE I,LOC:NEXT I:CLOSE #2
32230 GOTO 32000
32240 SCREEN=PEEK(88)+PEEK(89)%256:RETUR
N
32500 REM %%WRITTEN BY JOSEPH TREM%%
32501 REM %% SCREEN SAVE ROUTINE  %%
32502 REM %%       7/81           %%
```

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Part I:

A Superboard II Monitor

Frank Cohen
Pacific Palisades, CA

In the last article I stated my opinion of the OSI Superboard II's video output. The result was an advanced cursor routine to supplement the powerful ROM-based Microsoft BASIC. Super-Cursor adds many functions to the output routine of BASIC. However, Super-Cursor is a very long routine (almost 500 bytes long) and entering it into the Superboard can take forever using the existing monitor program. This gave me the inspiration to write the next couple of programs.

Upon turning on the Superboard and pressing the BREAK key, one is presented with a choice of entering the BASIC, disk or monitor programs. Unless one knows enough about how BASIC works to write a machine code interface, using the monitor program is the only way to program the computer in machine language. It only takes one look at the monitor program to know that one is very limited in the things that can be done.

The monitor will perform only three different things with the Superboard. First, it allows the viewing of one memory location at a time. This gives the capability of seeing one whole byte of memory for every given keyboard entry. Imagine trying to look through a program like Super-Cursor one byte at a time, keeping in mind there are over 500 instructions. Finding one byte incorrectly entered would take hours. Second, the monitor allows the modification of only one location at a time. After a byte has been entered, the next address is displayed. A problem will occur here if you are not sure the byte you just entered was correct. In this case you would have to go back and look at the last memory location. It then becomes necessary to retype the four digits of the previous address. Finally, the monitor allows the entry of a machine language program from a cassette recorder. Of course, it doesn't allow one to store a program on a cassette recorder (which leads one to wonder what one would be loading to begin with).

An Advanced Monitor

It doesn't take long after you start programming in machine language to realize the necessity of a more advanced monitor program. This program (and two others to follow) form an advanced monitor routine. To be quite original I have named the total program Super-Monitor. It is intended for the type of person who knows the basics of machine language programming and wants to expand his knowledge. The three programs are fully documented and in assembly language format. They are written in three separate packages so that you, the user, can modify to your specifications while, at the same time, learn some simple machine language programming techniques.

Before we start, an outline of what a monitor program should do will make the whole thing come together at the end. First, the monitor should be able to display as few or as many memory locations at one time as is desired. Second, it should allow easy entry of many bytes into the Superboard's memory along with the ability to see what was just entered. Third, it should allow the user to fill many memory locations with certain strings or combinations of bytes. Fourth, it should be able to move a whole block of data from one location to another in memory. Fifth, we should have a routine to store memory onto tape. Finally, we should have a routine to read a program from tape to memory with verification. Once all this is accomplished, entering and editing machine language programs will be a snap.

Hexdump

This program allows us to see many locations of memory at once. It will ask you for a beginning memory address and then it will print one line of eight bytes of data from the memory address specified. It will then wait for your command. If you want the next line of eight bytes to be listed, you simply hit the carriage return key. If you want to list another part of memory, you hit the line feed key and HEXDUMP will start again by asking for a new beginning address.

Before we get into seeing just how Hexdump works, here is a small word of warning. If you read the article describing Super-Cursor V1.3 in **COMPUTE!** #18 you should nave noted that my Superboard II has had the video modifications added to give a video display of 26 lines with 48 characters per line, using the Super-Cursor program. The modifications are simple and well described in conversion plans which can be purchased from Elcomp Publishing (Silver Spur Electronics, Chino, California.)

Hexdump does use some of the routines in Super-Cursor so it is necessary that you load Super-Cursor as well. If you don't want to use Super-Cursor, you will have to write your own output routines to allow Hexdump to display information onto the screen. Writing these routines is not very difficult and you probably could copy the individual routines out of Super-Cursor with only a few modifications.

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The assembly listing of Hexdump shows that it loads into locations 1D20 through 1E38. This is the area in memory directly below Super-Cursor V1.3. There are seven bytes of memory which separate the two programs. These will be used later for another part of Super-Monitor. Hexdump may be moved to another location in memory by reassembling it; however, if you do not own an assembler, relocating Hexdump may become very difficult as it uses absolute addresses extensively.

Hexdump is an example of structured machine language programming. It uses a main supervisor routine which branches into other routines. The supervisor is labeled Hexdump in the assembly listing, and calls all of the other subroutines into play.

Upon starting Hexdump, the supervisor homes the cursor using the Home routine of Super-Cursor V1.3. This positions the solid block cursor in the upper left position of the screen. The program then goes to the subroutine labeled Padr. This subroutine prints the two byte address held in location 00E7 and 00E8. This address is later used to find the memory location you want to display.

The program continues by jumping to another subroutine. This one called Inadr. This subroutine reads the keyboard four times, allowing the input of a four digit memory address. The resulting two byte address is put into locations 00E7 and 00E8 (ADR). Once the four numbers have been entered, the program jumps back to the supervisor which again homes the cursor. The program then jumps to another subroutine labeled Pline.

Up to this point you probably will not be modifying the program very much as the function of the subroutines are very straightforward. However, Pline will probably need to be modified as it prints the start address of the desired memory locations and then prints the eight bytes of data contained in those locations. The number of data bytes printed is what may need to be changed, if you have not added the video modifications to your Superboard. On a 24 by 24 video display you can only print up to five bytes at a time unless you don't mind the information falling off one line and continuing on the next. The number of bytes printed is controlled by the byte at 1E24. In the assembly listing you can see that the program between 1E22 and 1E30 is concerned only with checking to see if Pline has printed eight characters and, if it has, to return back to the supervisor. To change the number of bytes printed per line, it is necessary to put the desired number at 1E23 and a copy of that number at 1E2B.

Now that Pline is finished and we have returned to the supervisor, you can see that Hexdump checks the keyboard and, if a carriage return is entered (ASCII value of 0D), it will branch back to print the next eight bytes of memory. If a line feed is entered (ASCII value of 0A), it will branch back to the part of the program which homes the cursor and starts it all again.

Next Month

We now have a program which is the first part of a very advanced monitor program. What comes next is two other routines which include the functions listed in our outline. They are smaller routines than Hexdump. The resulting Super-Monitor will allow you to enter large programs in a single bound.

```
                        ;This program uses some subroutines from
                        ;Super-Cursor V1.3  (COMPUTE! Nov. '81)
                        ;
                        ;Zero page usage is limited to only
                        ;two bytes-
                        ;  00E7 - ADR
                        ;  00E8 - ADR+1
                        ;which are the low and high bytes forming an
                        ;address for which HEXDUMP looks into memory.
                        ;
                        ;
*=1D20                  ;Start of program and entry point.
                        ;
1D20 20 80 1E   HEXDUMP JSR HOME        ;Home the Cursor
1D23 20 3C 1D   DIA     JSR PADR        ;Print address
1D26 20 80 1E           JSR HOME        ;Home the cursor again
1D29 20 93 1D           JSR INADR       ;Input address
1D2C 20 00 1E   DAL     JSR PLINE       ;Print one line
1D2F 20 BA FF   BD      JSR KEYIN       ;Reads the keyboard result in A
1D32 C9 0D              CMP #$0D        ;Key pressed = CR?
1D34 F0 F6              BEQ DAL
1D36 C9 0A              CMP #$0A        ;Key pressed = LF?
```

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OSI COLOR-80

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```
1D38 F0 E9              BEQ DIA
1D3A D0 F3              BNE BD
                                        ;
1D3C A5 E8      PADR    LDA ADR+1       ;Print address on screen
1D3E 29 F0              AND #$F0        ;Start with high 4 bits of
1D40 4A                 LSR             ;ADR +1  (00E8)
1D41 4A                 LSR
1D42 4A                 LSR
1D43 4A                 LSR
1D44 20 72 1D           JSR CVHA        ;Convert Hex to Ascii
1D47 20 40 1E           JSR CURSOR      ;Part of Super-Cursor
1D4A A5 E8              LDA ADR+1       ;Now do the low 4 bits of ADR+1
1D4C 29 0F              AND #$0F
1D4E 20 72 1D           JSR CVHA
1D51 20 40 1E           JSR CURSOR
1D54 A5 E7              LDA ADR         ;Now work on high 4 bits of ADR
1D56 29 F0              AND #$F0
1D58 4A                 LSR
1D59 4A                 LSR
1D5A 4A                 LSR
1D5B 4A                 LSR
1D5C 20 72 1D           JSR CVHA
1D5F 20 40 1E           JSR CURSOR
1D62 A5 E7              LDA ADR         ;work on low 4 bits of ADR
1D64 29 0F              AND #$0F
1D66 20 72 1D           JSR CVHA
1D69 20 40 1E           JSR CURSOR
1D6C A9 2D              LDA #$2D        ;Print '-' on screen after address
1D6E 20 40 1E           JSR CURSOR
1D71 60                 RTS
                                        ;
1D72 A2 00      CVHA    LDX #$00        ;Convert whats in A from Hex to
1D74 8E 78 1D   CVST    STX CON+1       ;ASCII
1D77 C9 00      CON     CMP #$00        ;This value is changed in CVST
1D79 F0 04              BEQ CFIN
1D7B E8                 INX
1D7C 4C 74 1D           JMP CVST
1D7F BD 83 1D   CFIN    LDA CDATA,X     ;Put result in A
1D82 60                 RTS
1D83 30 31 32   CDATA   DATA            ;Data used in both CVHA and CVAHX
1D86 33 34 35           DATA            ;to convert Hex to Ascii and back.
1D89 36 37 38           DATA
1D8C 39 41 42           DATA
1D8F 43 44 45           DATA
1D92 46                 DATA
                                        ;
1D93 20 80 1E   INADR   JSR HOME        ;Input 4 digit (2 byte) Address
1D96 20 BA FF           JSR KEYIN       ;Read Keyboard Routine from ROM
1D99 20 40 1E           JSR CURSOR      ;Super-cursor
1D9C 20 F3 1D           JSR CVAHX       ;Convert Ascii to Hex
1D9F 0A                 LSL
1DA0 0A                 LSL
1DA1 0A                 LSL
1DA2 0A                 LSL
1DA3 8D AC 1D           STA INADC+1     ;Pokes A into 1DAC
1DA6 A5 E8              LDA ADR+1
1DA8 29 0F              AND #$0F
1DAA 18                 CLC
1DAB 69 00      INADC   ADC #$ 00
1DAD 85 E8              STA ADR+1
```

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```
1DAF 20 BA FF           JSR KEYIN       ;Get second digit
1DB2 20 40 1E           JSR CURSOR
1DB5 20 F3 1D           JSR CVAHX
1DB8 8D C1 1D           STA INBDC+1     ;Pokes A into 1DC1
1DBB A5 E8              LDA ADR+1
1DBC 29 F0              AND #$F0
1DBF 18                 CLC
1DC0 69 00      INBDC   ADC #$00
1DC2 85 E8              STA ADR+1
1DC4 20 BA FF           JSR KEYIN       ;Get third digit
1DC7 20 40 1E           JSR CURSOR
1DCA 20 F3 1D           JSR CVAHX
1DCD 0A                 ASL
1DCE 0A                 ASL
1DCF 0A                 ASL
1DD0 0A                 ASL
1DD1 8D DA 1D           STA INCDC+1     ;Pokes A into 1DDA
1DD4 A5 E7              LDA ADR
1DD6 29 0F              AND #$ 0F
1DD8 18                 CLC
1DD9 69 00      INCDC   ADC #$00
1DDB 85 E7              STA ADR
1DDD 20 BA FF           JSR KEYIN       ;Get the last digit
1DE0 20 40 1E           JSR CURSOR
1DE3 20 F3 1D           JSR CVAHX
1DE6 8D EF 1D           STA INDCD+1     ;Poke A into 1DEF
1DE9 A5 E7              LDA ADR
1DEB 29 F0              AND #$F0
1DED 18                 CLC
1DEE 69 00      INDCD   ADC#$00
1DF0 85 E7              STA ADR
1DF2 60                 RTS
                                        ;
1DF3 A0 00      CVAHX   LDY#$00         ;Convert contents of A from
1DF5 D9 83 1D   CVCON   CMP CDATA,Y     ;Ascii to Hex
1DF8 F0 04              BEQ CVFIN
1DFA C8                 INY
1DFB 4C F5 1D   CVFIN   JMP CVCON
1DFE 98                 TYA             ;Put result in A
1DFF 60                 RTS
                                        ;
1E00 20 3C 1D   PLINE   JSR PADR        ;Print one line of eight bytes
1E03 A0 00              LDY #$ 00
1E05 B1 E7      PBYTE   LDA (ADR),Y     ;Print one byte from ADR
1E07 29 F0              AND #$F0
1E09 4A                 LSR
1E0A 4A                 LSR
1E0B 4A                 LSR
1E0C 4A                 LSR
1E0D 20 72 1D           JSR CVHA        ;Convert A to Ascii
1E10 20 40 1E           JSR CURSOR      ;Super-cursor
1E13 B1 E7              LDA (ADR),Y     ;Print low 4 bits on screen
1E15 29 0F              AND #$0F
1E17 20 72 1D           JSR CVHA
1E1A 20 40 1E           JSR CURSOR
1E1D A9 20              LDA #$20        ;Print a space " " to separate
1E1F 20 40 1E           JSR CURSOR      ;the bytes
1E22 C8                 INY             ;Are we finished?
1E23 C0 08              CPY #$08
1E25 D0 DE              BNE PBYTE       ;If not display another byte
```

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```
1E27 A5 E7              LDA ADR         ;If yes add 08 to ADR
1E29 18                 CLC
1E2A 69 08              ADC #$08
1E2C 85 E7              STA ADR
1E2E 90 02              BCC RCOM
1E30 E6 E8              INC ADR+1
1E32 20 95 1E   RCOM    JSR CR          ;Were finished printing one line
1E35 20 AB 1E           JSR LF          ;so carriage return and line feed
1E38 60                 RTS
                                        ;
                                        ;
                                        ;
;Statistics
;
*=      1D20    ;Start
1D3C    PADR    ;Print ADR and ADR+1 on screen
1D72    CVHA    ;Converts Hex to Ascii
1D93    INADR   ;Input a two byte address for ADR and ADR+1
1DF3    CVAHX   ;Converts Ascii to Hex
1E00    PLINE   ;Print a line of 8 bytes from ADR
1E40    CURSOR  ;Prints what ever is in A to where the cursor is
1E80    HOME    ;Home the cursor
1EC2    CLS     ;Clear screen
```


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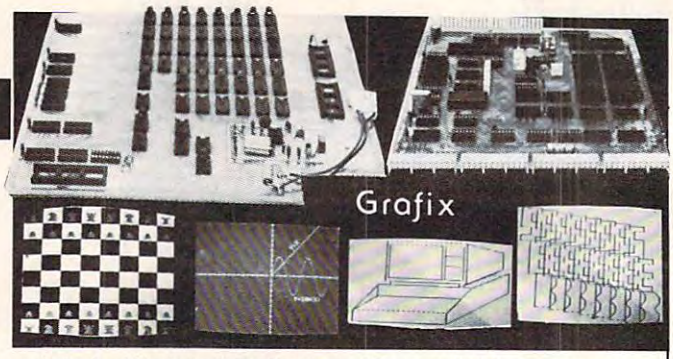

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Alkemstone is more than just a treasure hunt. It also has the challenge and intrigue of a fascinating computer game. It features hi-res color graphics, 3-D animation, sound effects and an illustrated short story. Alkemstone is written in machine language for any Apple Computer with 48K, one 16 sector disk drive and Applesoft or language card.

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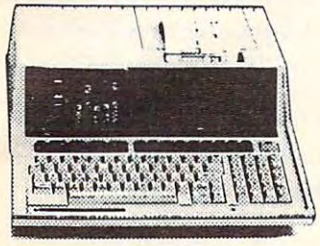

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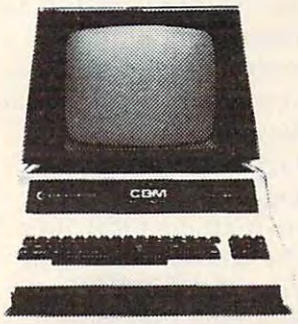

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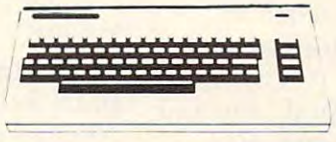

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Some of the features which make this possible are:

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- Free-form entry of expressions of up to 240 characters (including standard math operators, pre-defined functions, user-defined formulas, parentheses, variables, etc.).
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MatheMagic has been released on the Apple II and II+ and Z80 based micros running under CP/M 2.2 ISM plans to release versions for the Atari 800, TRS-80 I, II, and III, Commodore PET/CBM and the IBM PC during January and February 1982.

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The International Software Directory

The International Software Directory lists tens of thousands of software packages and classifies them by machine, operating system, subject, vendor and price. Review information is also included. It is independent of both machine manufacturers and software houses, and thus allows for comparison and one-stop shopping. It is backed by an excellent search service and regular updates are available from the publisher. In addition, an on-line service is available through Lockheed dialog.

The ISD is available in two volumes:

1) The International Microcomputer Software Directory which contains over 7000 programs and

is available at the extremely competitive price of $34.95 plus $2.95 postage and handling.

2) The International Minicomputer Software Directory which is available for $65.00

Imprint Editions
420 South Howes
Fort Collins, CO 80521
(303) 493-2710

Commodore Canada Announces New Mailing List Software

Toronto – A versatile new electronic mailing list software package called Scratchpad has been announced by Commodore Business Machines Limited.

Intended for business applications, the program is easy to use, flexible and rapid in accessing required data. There are 20 different data items, each with a 30-character length. A great deal of data may be stored on file as a file can consist of any number of disks.

Some of the modes of operation in Scratchpad are Edit, Global Search, Format, Recreate, Print and Backup.

Any data created with the Scratchpad, developed by Richvale Telecommunications of Richmond Hill, Ont., may be interfaced with Wordpro software by the use of a small additional program.

Suggested retail price in Canada is $295. For further information:

Isobel McBurney
Software Manager
Commodore Business Machines Limited
3370 Pharmacy Avenue
Scarborough, Ont. M1W 2K4.
(416)449-4292

Dragon's Eye Now Available

Mountain View, CA – Dragon's Eye, an EPYX game from Automated Simulations, Inc., is now available for the Atari 400 and 800 computers.

Dragon's Eye, an overland fantasy role playing game, challenges the player to find a magical gem, the Dragon's Eye, in 21 game-days (approximately half-an-hour playing time).

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The Eye is hidden somewhere within one of the seven provinces, and the player must find it and return it to Fel City, where his journey began.

The player chooses one of 16 characters and gains a set of magical abilities, such as healing, flying, time travel and teleport. Which spells he gets are different each time he plays. He is equipped with his choice of four swords, a bow and arrows, and magic bolts.

While searching, the player sees a detailed map of the provinces on the screen, along with his location, strength, health, and other information.

The player encounters dragons, bats, vampires, ghosts, golems, serpents, skeletons and other monsters. He can choose between 13 commands, from firing an arrow and fighting with sword to casting magic spells and searching for hidden paths.

When a battle is engaged, fully animated graphics display the action between player and beast.

Dragon's Eye is available on cassette for the ATARI 400/800 (32K) and PET (32K), or on disk for the APPLE (48K with ROM Applesoft), and ATARI 400/800 (32K), from:

Automated Simulations, Inc.
P.O. Box 4247
Mountain View, CA 94040
$24.95

Commodore Introduces Lowest Priced Modem In The Computer Industry

Valley Forge, PA, January 7, 1982 – A low priced modem has been introduced by Commodore Business Machines, Inc.

The new "VICMODEM," which retails for $109.95, is an easy-to-use plug-in cartridge that connects directly to the user port of Commodore's VIC 20™ home computer, and may be used with any modular style telephone.

The VICMODEM, which is planned for retail sale in the Spring of 1982, allows users to communicate and exchange data with other computer owners over the telephone. This latest VIC peripheral also allows users to inexpensively access telecomputing networks such as the Source™ or Compuserve™, which provide services such as stock quotes and company reports, newswire stories, research data, sports scores, airline reservations, shopping services and more.

The VICMODEM is a direct connect, 300 baud modem with originate/answer and half/full duplex capabilities. The combined cost of the VIC 20 and a VICMODEM is less than $410.00.

Microsette Introduces Mini-Diskettes

Microsette Co. is adding 5¼" diskettes to its line of computer and audio cassettes. The diskettes are useable with Apple, Atari, Commodore, Tandy TRS-80, PMC-80 and PMC-81 computers from Personal Micro Computers and many mini-computer and word processing systems.

The diskette surface is certified error free on one side and is for all soft-sectored, single or double density applications. The burnished diskette surface insures longer head life and excellent media durability. Furthermore, the diskettes feature a reinforced hub which gives longer diskette life in this high wear area.

Microsette MD-5 diskettes are attractively packaged in a sturdy green box with each of the 10 diskettes in a long-lasting Tyvek envelope. Each diskette has a corner label and each box of 10 contains 20 silver write

protect tabs and 20 large color coded labels.

Microsette MD-5 diskettes are sold by mail order in units of 10 (1 box) or 50 (5 boxes). Suggested list price is $3.95 per diskette and mail order prices are $2.50 each in the box of 10, or $2.20 each in the box of 50. Prices include UPS shipping.

Further information and dealer pricing may be obtained from Microsette.

Microsette Co.
475 Ellis Street
Mountain View, CA 94043
(415)968-1604

Five New Programs From Atari

Sunnyvale, CA – January 5, 1982 – Three new home computer game programs, a bookkeeping package and a home filing system were introduced by the Home Computer Division of Atari, Inc.

Pac-Man is the Atari Home Computer version of a very popular coin-operated game. In this version, a player's character must negotiate a maze without being eaten by any of four pursuers. By eating an "energy" dot the player's character can gain the ability to attack and gobble up the pursuers. For use on both the Atari 400 and Atari 800 Home Computers, this $44.95 game comes in cartridge form, and will be available in the second quarter of 1982.

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Centipede is another Atari Home Computer version of a best-selling coin-operated game. In this version, the player uses a "Bug Blaster" to defeat colorful legions of attacking spiders, fleas, scorpions, the Centipede itself, and poisonous mushrooms. The $44.95 game can be used on both Atari 400 and Atari 800 Home Computers. It comes in cartridge form and will be available in the second quarter of 1982.

Caverns Of Mars is a fascinating new game that takes players beneath the surface of Mars. The player's character must penetrate several layers of defenses to reach the Aliens' stronghold. Floating mines, "enemy" ships on patrol and deadly laser fire menace the player constantly. This game was originally developed for the Atari Program Exchange and won a prize in the APX quarterly software contest for its 17-year-old author. This $39.95 game can be used on both the Atari 400 and Atari 800 Home Computers with an Atari 810™ Disk Drive. It comes in diskette form and will be available in the first quarter of 1982.

The Bookkeeper is an accounting system designed to meet the needs of people who do business from their homes and for those who run their personal finances in a business-like fashion. It is a low-cost, comprehensive accounting system that generates professional calibre reports, such as Profit and Loss Statements, Balance Sheets, Accounts Receivable and Payable. It will handle 1,000 transactions a month and up to 350 General Ledger accounts, vendors and customers.

The Bookkeeper consists of four diskettes, including a sample company data diskette that lets you familiarize yourself with The Bookkeeper before you start entering data of your own. The package requires an Atari 800 Home Computer with Atari BASIC language cartridge and 48K of Random Access Memory, an Atari 810 Disk Drive, an Atari 825™ 80-Column Printer and an Atari 850™ Interface Module.

Price and availability will be announced later.

The Home Filing Manager lets a user create, store, edit, retrieve and print information similar to that found on 3"x5" index cards. It provides a convenient way to catalog books, addresses, clothes, recipes, record collections, Christmas card lists, vocabulary words, term paper notes, and the like.

The user can search in alphabetical or reverse alphabetical order or locate an entry by its title or a phrase it contains.

Price and availability will be announced later.

Scheduled Educational Conferences

National Educational Computing Conference (NECC-82)
Kansas City, MO
June 28-30, 1982

The purpose of the conference is to provide a forum for discussion among those interested in educational computing. Based on previous conferences, approximately 1000 people from institutions at all levels are expected to attend. Between 50 and 75 vendors are expected to exhibit at the conference.

Papers will be presented which describe actual experiences with computer use in the classroom or consequences of such use on the educational process in general. The diversity of disciplines and participation by individuals from elementary, secondary, and post secondary education provide a unique opportunity for cross-pollination of ideas and experiences. Additional conference activities include preconference workshops, project presentations, vendor exhibits, special sessions, tutorials, and birds-of-a-feather sessions.

Additional information may be obtained from:

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E. Michael Staman
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University of Missouri-Columbia
305 Jesse Hall
Columbia, MO 65211

* * * * * * *

Computers in Education Conference
Seattle Pacific University
Seattle, WA
March 12 & 13, 1982

The annual conference will include talks, workshops, and exhibits with emphasis on the use of the microcomputer in K-12 classrooms of various disciplines.

Tony Jongejan
Everett High School
2416 Colby
Everett, WA 98201

* * * * * * *

Microcomputer Conference
The University of Victoria
Victoria, British Columbia
May 6-8, 1982

Moving Microcomputers Into The Mainstream Of Education will be an opportunity for both a formal and an informal sharing of ideas, information and experiences amongst educators. The major focus of the conference will be the integration of the microcomputer into the established curriculum into the classroom, and into the administrative offices of school districts.

The conference is designed to provide educators with information regarding applications that have been tried and tested in the schools to achieve this purpose. A series of keynote addresses, workshops, papers, and short presentations have been planned. A call for presentations can be found in the upcoming issue of Micro-scope.

The conceptual threads of the conference are:

1. Classroom applications.
2. Administration applications.
3. Courseware development and evaluation.
4. Future implications of technology in instruction.

University housing will be available at reasonable rates.

University Extension
Conference Office
721-8475

* * * * * * *

Southern California Computers in Education Conference
University High School
Irvine, CA
May 14-15, 1982

This second annual conference is sponsored by Computer-Using Educators.

Workshops and field trips will be held on Friday, May 14 at schools and industry scattered throughout Southern California. On Saturday all sessions will be held at University High School, Irvine starting at 9:00 a.m.

Classroom applications of computers to all areas of the curriculum will be presented covering all grade levels from kindergarten through two-year college. The major emphasis of the conference will be on getting started with microcomputers.

The Friday night banquet speaker will be Prof. Lud Braun, School of Engineering, University of New York. The keynote address on Saturday morning will be delivered by Dr. William "Sandy" Wagner.

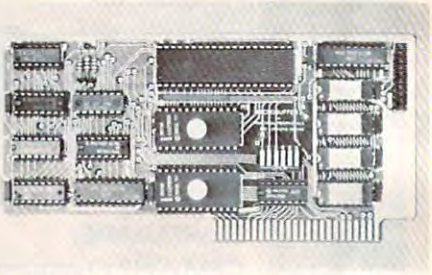
Preregistration is $10 for CUE members and $16 for nonmembers. Preregistration must be received by April 30th, 1982. *No purchase orders accepted.* On-site registration will be available on Saturday for $18. All checks should be made out to CUE (or Computer-Using Educators) and mailed to the address below.

One unique feature of the conference will be several computer workshops held at sea. The unofficial slogan of the conference is "PET your APPLES in Orange County."

Craig Walker
1982 Conference Chairperson
Arrowview Intermediate School
2299 North "G" Street
San Bernardino, CA 92405
(714)886-9118

Buffered Parallel Printer Interface

The Microbuffer II is an intelligent buffered parallel printer interface for the Apple II computer. The Microbuffer II includes 16K of on-board RAM so the computer does not have to wait for the printer to finish before continuing with other



processing. Buffer memory size is user expandable to 32K using industry standard 64K RAM chips. The Microbuffer II is compatible with Applesoft, CP/M, and Pascal and includes advanced high resolution graphics print routines for the Epson MX-80 with Graphtrax, Anadex, IDS Paper Tiger, NEC Prowriter, as well as complete print formatting features. The Microbuffer II is available for $259.

Practical Peripherals, Inc.
31245 La Baya Drive
Westlake Village, CA 91362
(213)991-8200

MIT LOGO For Apple Computers

The Krell Software Corp. Stony Brook, NY is pleased to announce that *MIT's LOGO* for Apple II computers is now available. This is the authorized version of the LOGO language for Apple developed by MIT under the sponsorship of the National Science

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Foundation.

This unique and powerful language was written specifically for educational application. It is highly graphic and ideal for introducing young people to the use of microcomputers. *MIT LOGO For Apple* is by no means an abridged version suitable to children only, it is the full programming language whose capabilities and versatility rival and at many places, supersede those of BASIC, FORTRAN, and PASCAL.

Krell's complete package includes the LOGO language system, Krell's own Instant LOGO tutorial program, and its unique introduction to LOGO, *Alice In LOGOLAND*. The entire package is fully documented for teachers and students. Since LOGO requires a disk system with 64K of memory an optional 16K RAM board extension is available at the special price of $109.95. The entire software package is available for $179.95.

Krell Software Corp.
21 Millbrook Drive
Stony Brook, NY 11790
(516)751-5139

Atari Special Additions

Sunnyvale, CA – January 6, 1982 – One hundred and seventeen vendors are represented with more than 400 products in *Atari Special Additions*, the first edition of a new catalog of programs, equipment accessories, furniture and publications designed for users of Atari 400 and Atari 800 Home Computers.

Atari Special Additions is intended to be a useful guide to equipment, and programs produced by other manufacturers," said Roger H. Badertscher, president of the company's Home Computer Division. "It is a measure of the continuing success of our product line that so many vendors are offering so many products to be used with Atari Home Computers."

The catalog, with a cover price of $3.00, is available from Atari Computer retailers, and will be mailed free to owners of Atari Home Computers who have filed warranty cards and to subscribers of *The Atari Connection*, the quarterly magazine the company publishes for owners of its computer.

New Product releases are selected from submissions for reasons of timeliness, available space, and general interest to our readers. We regret that we are unable to select all new product submissions for publication. Readers should be aware that we present here some edited version of material submitted by vendors and are unable to vouch for its accuracy at time of publication. ©

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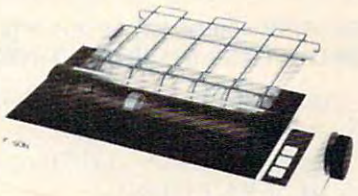

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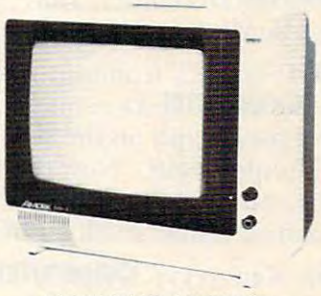

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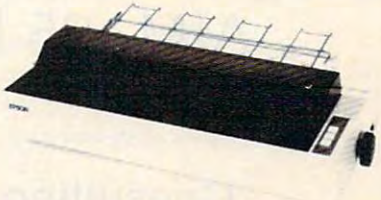

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CAPUTE!:
Corrections And Amplifications

1. "Spacewar Part 2," *Home and Educational COMPUTING!*, Fall 1981, pg. 21: an ?Out Of Memory error can occur after several rounds of the game. The following changes will prevent this as well as the problem with the black hole option:

```
6 SX=50:SY=50:POKEV-9,255:?"[CLEAR]":X=S+A:
  FORI=XTOX+505:POKEI,T:NEXTI
```

And change lines 18 and 45 to contain GOTO 47 (instead of GOSUB47).

Change lines 59 and 70 to contain GOTO17 (instead of RETURN).

Changing line 140 to: 140 POKE52,28: POKE56,28:CLR will allow you to make modifications and debug the program without running out of memory. (Our thanks to Ken Denniston and Ronald Gruenzel for these suggested improvements.)

2. "Window Analysis," **COMPUTE!**, December, 1981, pg. 35, line 720: GOSUB FNTRC should read GOSUB FTRC.

3. "A Simple Printer Interface For Apple II," **COMPUTE!**, December, 1981, pg. 85: 220 OHMS should be 2200 OHMS (and vice versa).

4. "PET To PET Communication Over The User Port," **COMPUTE!**, December, 1981, pg. 142: The second paragraph on the second column of this page should begin, "Now the receiver can leave line 40 and read the data byte (on line 50). The transmitter is now stuck on line 90 . . ."

5. "File Recovery," **COMPUTE!**, December, 1981, pg. 164: to apply Program 1 to the 2040 Disk Drive, the following lines are required.

```
145 PRINT "ENTER TRACK NUMBER OF 1ST
    DATA BLOCK": INPUT TT
414 PRINT#15,"B-P:"3;5+32*R-2
416 PRINT#1,CHR$(TT);
```

6. "The Beginner's Page," **COMPUTE!**, January, 1982, pg. 24: part of the Atari version of the program was missing. Here it is in its entirety:

```
100 DATA SUPER,ACME,AMERICAN,RAINBOW,QUA
LITY,INTERGALACTIC,RELIABLE,FOOLPROOF
110 DATA PROGRAMS,SOFTWARE,COMPUTERWARE,
CODE,LISTINGS,INFORMATION,MAGIC
120 DIM ADJECTIVE$(8*20),NOUN$(7*20),TEM
P$(20),L1(8),L2(7)
130 FOR I=1 TO 8:READ TEMP$:ADJECTIVE$(I
*20-19,I*20)=TEMP$:L1(I)=LEN(TEMP$):NEXT
 I
140 FOR I=1 TO 7:READ TEMP$:NOUN$(I*20-1
9,I*20)=TEMP$:L2(I)=LEN(TEMP$):NEXT I
150 FOR I=1 TO 7
160 FOR J=1 TO 8
170 PRINT ADJECTIVE$((J-1)*20+1,(J-1)*20
+L1(J));" ";NOUN$((I-1)*20+1,(I-1)*20+L2
(I))
180 NEXT J
190 NEXT I
```

7. "Invest," **COMPUTE!**, January, 1982, pg. 39: the author suggests that the following changes be made to his program since equity buildup for an investment should be multiplied by the initial amount financed rather than the yearly payment amount. As the program stands, it makes an investment look
a little better than it really is. The following will correct the problem:

```
7490 PN = PR - DP : REM THIS IS THE AMOUNT
     YOU'RE FINANCING
7500 EB = PN * E1 (Y,I) : REM THIS IS THE EQUITY
     BUILDUP FOR 12 MONTHS, 1ST YEAR
7502 EB = EB/12
7503 EB = EB * M : REM THIS IS THE EQUITY
     BUILDUP FOR THE MONTHS YOU'LL OWN
     IT, THE 1ST YEAR
7505 EB = EB/1000
7510 ET = PN * E2 (Y,I) : REM EQUITY BUILDUP
     FOR THE 2ND YEAR
7515 ET = ET / 1000
```

8. "Apple Addresses," **COMPUTE!**, January, 1982, pg. 83: the program was missing from this article. The entire article is being reprinted in this issue, starting on page 163.

9. "Tinymon1," **COMPUTE!**, January, 1982, pg. 176: Jim Butterfield writes, "I bungled it! In my zeal to make the whole thing as painless and foolproof (!) as possible, I added four bytes to the end of the program. This made the checksum straightforward, and made the hex entry a little simpler.

All of this would have been OK had I not added four bytes to the BASIC pointers, too. The 'first change' should have been:

```
.: 0028 01 04 14 08 14 08 14 08
```

If you punched the whole thing up and it doesn't work, all is not lost. Reload the program, make the above change, go back to BASIC and SAVE...and you will find yourself with a working Tinymon.

My apologies for all those nights of lost sleep. I really was trying to make it easier and bug-free...."

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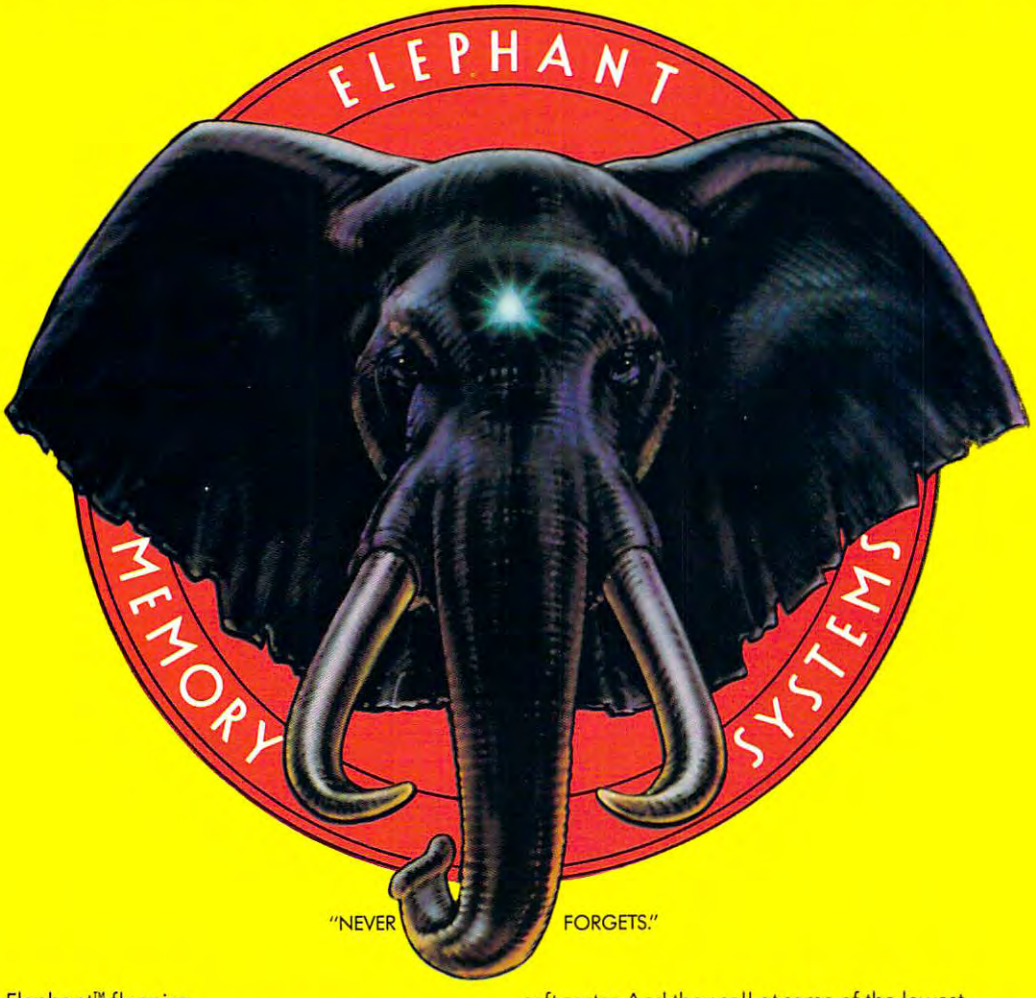

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