

Bowling Simulation for the C-64

Tenpins is a bowling simulation which offers the user something a bit different from most computer games. There is no time limit to worry about, no violent theme, and up to four people can participate. All you need is a single joystick,

By Tony Brantner

plugged into Port 2, which can be shared by all the players.

Moving the joystick up or down moves the bowler on-screen in that direction. Press the fire button when you are ready to release the ball. One advantage *Tenpins* has over most other bowling games is that you can "steer" the ball up or down after its release. Don't roll it to the sides of the alley, though, or you'll lose control. Your score is displayed on a scorecard above the alley, and your total, which is shown to the left of the scorecard, is updated after you finish your frame.

Scoring is just like in regular bowling, your total in each frame depending on what you roll. Knock down all ten pins in one roll (known as a strike), and you'll receive ten points plus the total of the next two rolls. Knock down the pins in two rolls (a spare), and you'll receive ten points plus the total of your next single roll. It should be noted that your score for that frame won't be totalled until you make the next roll(s). If any pins remain after two rolls (an open frame), then the number of those knocked down is added to your score. Rolling a strike in the tenth frame earns you two extra rolls, while a spare in that frame earns you one. □

SEE PROGRAM LISTING ON PAGE 125

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USING 128 COMMANDS IN 64 MODE

When developing Commodore programs to run in 64 or 128 mode, you sometimes cannot find a substitute for BASIC 7.0 commands. These keywords will not load or save correctly on a 64. They can, however, be embedded in PRINT statements and executed on a 128 using the dynamic keyboard technique. An example follows. It changes the 80 column screen color. This cannot be done with POKES.

—Edward Horgan
Coatesville, PA

```
•10 IFFRE(0)<>FRE(1)THENGOSUB1000
•20 END: REM PROGRAM STARTS HERE
•1000 PRINT"[CLEAR]"[4"[DOWN]"]COLOR6,2:CO
NT[3"[UP]"]"
•1010 POKE842,13:POKE208,1:END:RETURN
```

20 PROGRAMMABLE FUNCTION KEYS

The 128 has the ability to perform a whole series of commands with the touch of a single function key. Two problems though: There are only eight keys, and the buffer for storing all key definitions is only 245 bytes.

The method below cures both annoyances by defining the function keys to call a subroutine appended to your program. When implemented, the routine checks location 211 to see if the SHIFT, COMMODORE, SHIFT/COMMODORE, or ALT keys are pressed. Depending on the combination, up to 20 separate routines or commands can be executed with a single stroke. The only limit on length is the amount of available RAM.

—Edward Horgan
Coatesville, PA

```
•10 KEY 1,"GOTO9000"+CHR$(13)
•20 KEY 2,"GOTO9000"+CHR$(13)
•100 REM SHIFT
•200 REM COMMODORE
•300 REM SHIFT & COMMODORE
•400 END:REM ALT
•9000 IFPEEK(211)=0 THEN LIST
•9010 IFPEEK(211)=1 THEN LIST-100
•9020 IFPEEK(211)=2 THEN LIST-200
•9030 IFPEEK(211)=3 THEN LIST-300
•9040 IFPEEK(211)=8 THEN LIST-400
•9050 END
```

TWO FOR ONE

Hearing my computer constantly BEEPING and BUZ-

ZING to get my attention prompted this routine. The routine sounds a pleasant bell after printing "PRESS A KEY TO CONTINUE" on the screen.

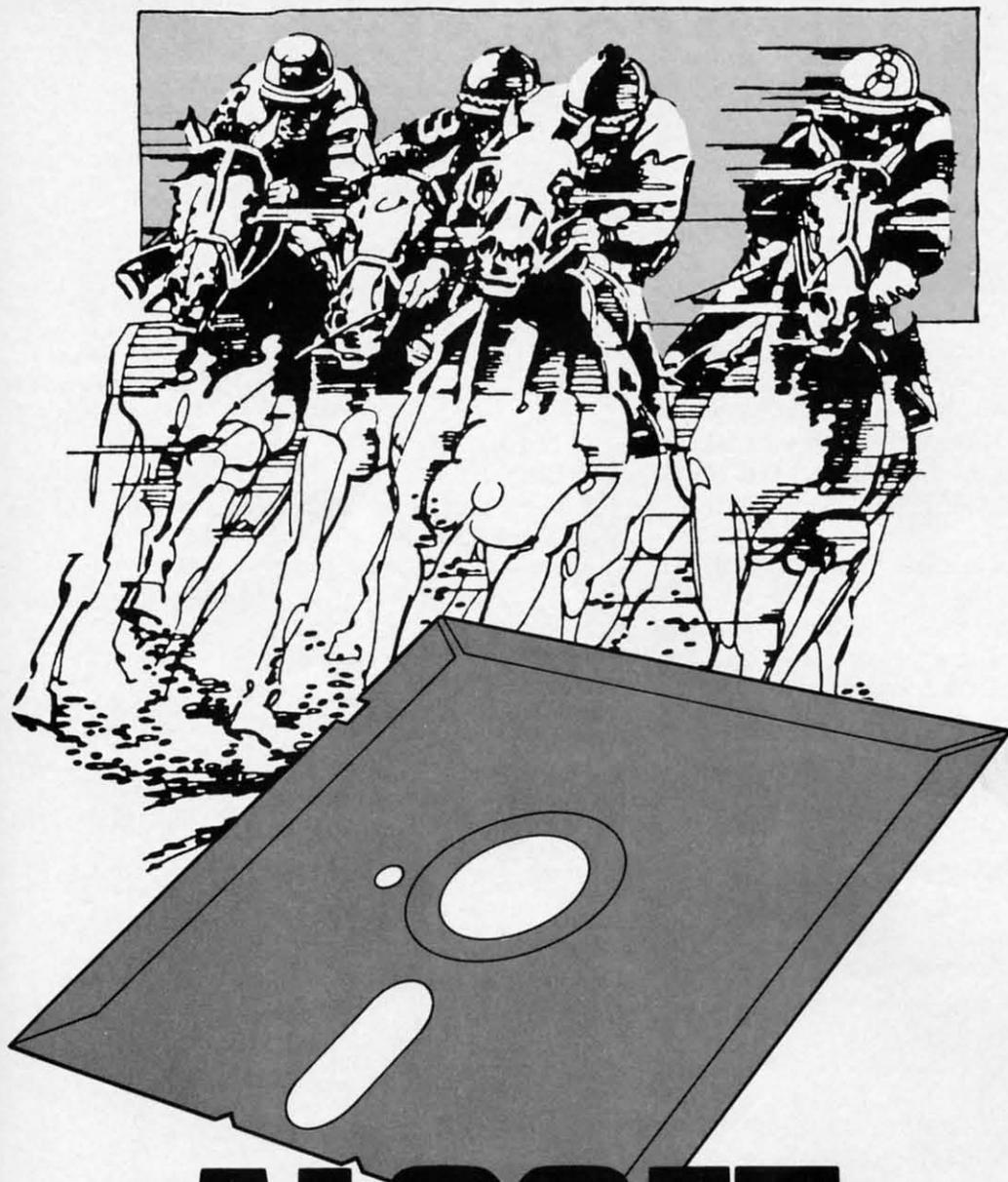
This was all well and good, but the "feature creature" (the little voice that keeps saying "yes, but wouldn't it be better if...") decided a simulated PRINT@ command, to control where the message printed, would be a good way to avoid destroying an aesthetic screen display. To position the cursor anywhere on the screen use line 1010. Note that by entering the KERNAL PLOT routine with SYS 58640 instead of SYS 58634, the routine will work regardless of the status of the carry flag. —Bob Ash
APO, NY

```
•10 REM ** TUNEFULL DELAY ROUTINE **
•20 ROW=24:COL=8
•30 GOSUB 1000
•40 END
•1000 REM ** SIMULATED PRINT-AT **
•1010 POKE214,ROW:POKE211,COL:SYS58640
•1020 REM ** DELAY ROUTINE **
•1030 PRINT"[RVSON] PRESS A KEY TO CONTIN
UE "
•1040 REM ** RING BELL UNTIL KEYPRESS **
•1050 S=54272:POKES+24,15:POKES+1,112:POK
ES,194:POKES+5,12:POKES+6,9
•1060 GETC$:IFC$="" THEN POKES+4,21:POKES
+4,20:FOR T=1TO700:NEXT T:GOTO 1050
•1070 RETURN
```

FLASHER

Here's a little ML routine you can use to brighten up those instructions, displays, or hi-scores. It only takes up 22 bytes, and is totally relocatable. Just change the address in line 10 to somewhere it doesn't interfere with your program and the operating system.

```
•0 SL=828:REM CHANGE SL TO STARTING ADDRE
SS
•10 POKE 53281,0:POKE 53280,0:REM BACKGRO
UND AND BORDER
•20 FOR X=SL TO SL+21:READC:POKEX,C:NEXT
•30 DATA 138,153,0,216,153,250,216,153,24
4,217,153
•40 DATA 238,218,200,232,192,251,144,237,
160,0,96
•50 PRINT"[CLEAR]":FOR X=1 TO 10:PRINT"TE
ST[DOWN][DOWN]";:NEXT
•60 GETA$
•70 FOR T1=1 TO 40:NEXT T1:REM CHANGE 40
TO MAKE FLASH FASTER OR SLOWER
•80 IF A$=""THEN SYS SL:GOTO 60
```



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•90 PRINT"[CLEAR][DOWN]BACK TO NORMAL"

To me a black background and border looks best. After selection is made, just clear the screen and continue with program. I hope you can use this in some of your programs.

—Robert M. Hickey
APO, SF

VARTAB CALCULATOR

Programmers who often load machine language programs may have experienced more than their share of OUT OF MEMORY ERROR's. This is caused by the fact that the end of BASIC pointer (VARTAB) is used as an index during loads. This works just fine for BASIC, but after a non-relocating load, this pointer is moved to point to the end of the data that was loaded, whether it was BASIC or not.

Below is a short utility that will recalculate VARTAB by counting the bytes in the BASIC program currently in memory. It is 100% relocatable, so it may be moved from location 679 by changing the variable L on line 10. Wherever it is located, SYS 2 will always activate it.

To demonstrate its use, suppose you are writing a BASIC program and decide that you need the DOS wedge, so you LOAD"DOS 5.1"8,1 and SYS 52224. Now almost anything you do will cause an OUT OF MEMORY ERROR. Simply enter SYS 2 and the program is left intact and the pointers point to the right places. This program will also restore VARTAB if it has been altered in some other way. A word of caution, though. It will truncate anything after the zeros marking the end of the BASIC program, so any data hidden after the program will be lost if it is saved.

—Danny Faught
Sherman, TX

```
•1 REM VARTAB CALCULATOR
•2 REM DESIGNED BY DANNY FAUGHT
•10 L=679:HI=INT(L/256):LO=L-HI*256
•20 POKE2,76:POKE3,LO:POKE4,HI
•30 FORX=LTOLO+52:READA:POKEX,A:CK=CK+A:NEXT
•40 IFCK<>6541THENPRINT"[DOWN]DATA ERROR
  - RECHECK DATA STATEMENTS":END
•50 PRINT"[8" "]VARTAB CALCULATOR READY":
  PRINTTAB(11)"SYS 2 TO ACTIVATE"
•100 DATA 165,43,133,45,165,44,133,46,160
  ,0,177,45,240,7,200,208,249,230,46,208
•110 DATA 245,200,177,45,208,240,200,177,
  45,208,235,200,152,24
•120 DATA 101,45,133,45,133,47,133,49,165
  ,46,105,0,133,46,133,48,133,50,96
```

64 MEMORY REMINDER

When I'm working with a large program with a lot of string data, I want to be careful not to run out of memory. During program development, I keep a menu option to end the program. At the end of the exit routine, I insert the following lines to let me know how I'm doing

with memory consumption:

```
Y = PEEK(52)*256 + PEEK(51)
PRINT "BOTTOM OF STRING STORAGE: ";Y
Z = PEEK(50)*256 + PEEK(49)
PRINT "      END OF ARRAY SPACE: ";Z
PRINT "
  --"
X = Y - Z
PRINT "      REMAINING FREE MEMORY: ";X
```

—Thomas P. Shultz
Clarion, PA

E-Z DATA

Entering tons of DATA statements on the C-128 is a snap if you RUN this program first:

```
•10 IF DS$ THEN FAST:GOTO30:REM CHECK C
  OMPUTER TYPE
•20 PRINT"COMMODORE 128 REQUIRED.":END
•30 FOR X=1TO8:KEYX,"DATA":NEXT:REM NOW A
  NY FUNCTION KEY WILL PRINT THE WORD 'DAT
  A'
•40 FOR X=0TO88:POKE6912+X,PEEK(64128+X):
  NEXT:REM COPY ROM KEYBOARD DECODER TABLE
  INTO RAM
•50 POKE 830,0:POKE831,27:REM CHANGE POIN
  TERS TO RAM
•60 POKE 6994,44:REM CHANGE PERIOD TO A C
  OMMMA
•70 FOR X=842TO847:READ B$:POKEX,ASC(B$):
  NEXT:POKE848,13:POKE208,7:REM ACTIVATE A
  UTO LINE NUMBERING
•80 DATA "A","U","T","O","1","0"
•90 SLOW
```

What we've done is program all the function keys to print the word "DATA", changed the numeric keypad's period to a comma, and activated the 128's line-numbering utility (instead of 10—the "1" and "0" in line 80—use whatever increment matches the program you are entering). Now you can type entire DATA statements with one hand, leaving the other hand free to keep your place in the *Ahoy!* listing.

Important: If you own an international model 128 (it has an ASCII-DIN key instead of a CAPS-LOCK key) you must add:

```
45 POKE 2757,PEEK(2757) OR 128:REM DISA
  BLE POINTER RESET
```

—Bert Halverson
Joplin, MO

BASIC HIDER

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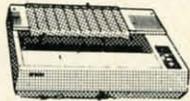
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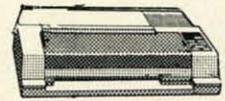
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When it is run, your specially prepared program will be made invisible to the C-64 LIST command and consequently also to all but the most determined of the curious.

Type in the program below, save a copy, and run it. This installs the routine into memory. Now load the program you wish to hide. This source program must be prepared in the following way before activating the *Hi-der* or it will be ruined: Using the insert mode, add exactly five colons between the line number and the first command. A space after the line number is okay, but no other spaces can appear between the first colon and the first command. These colons must be added to each and every line. To illustrate, the program

```
10 PRINT"HELLO"
20 GOTO 10
```

would be changed to

```
10 :::::PRINT"HELLO"
20 :::::GOTO 10
```

When the program is ready, type SYS 49152 in the direct mode. Not much seems to happen, but type LIST and see! Your new program can be saved and loaded like any other BASIC program, but studying or modifying it is a bear.

—Paul Sobolik
Pittsburgh, PA

```
•100 ML=49152:PRINT"[CLEAR][DOWN]REMEMBER
: PREPARE BASIC PROGRAM TO BE"
•110 PRINT"HIDDEN PRIOR TO ACTIIVATING BA
SIC HIDER"
•120 FORX=0TO66:READA:POKEML+X,A:CK=CK+A:
NEXT
•130 IFCK<>8519THENPRINT"ERROR IN DATA ST
ATEMENTS":END
•140 PRINT"[DOWN]SYS49152 TO ACTIVATE"
•150 DATA 169,1,133,251,169,8,133,252
•160 DATA 160,0,177,251,240,45,153,253
•170 DATA 0,200,192,2,208,244,32,45,192
•180 DATA 160,0,177,253,240,32,153,251
•190 DATA 0,200,192,2,208,244,32,52,192
•200 DATA 32,8,192,160,4,169,0,145,251
•210 DATA 96,160,4,169,0,145,253,96,32
•220 DATA 45,192,96,32,52,192,96
```

PRINTING THE LAST LINE

Below is a routine I developed for printing menus on the last line of the screen. Lines 35 and 70 offer two methods of printing text at the bottom right-hand corner of the screen without a carriage return. CHR\$(148) (line 35) is the INSERT character which shows as a reversed T (line 70) when used inside quotes. Also utilized in this routine is the WAIT 198,1 function, which waits for a key to be pressed. Lines 50-60 position the cursor at a

specific screen location (JJ is row#, KK is column #).

—Steven G. Eason
Wichita, KS

```
•5 POKE53281,0:POKE53280,0
•10 JJ=22:KK=0:GOSUB50:PRINT"[RVSON][RED]
PRESS ANY KEY TO CONT[c +][3" "];
•20 PRINT"[RVSON][RED]SYST STATUS [BLUE]O
K ";
•30 PRINT"[RVSON][GREEN] F1 [s B] F2 [s
B] F3 [s B] F4 [s B] F5/F7 [s B] CRS
R";CHR$(94)CHR$(32);
•35 PRINT"[RVSON]MAIN [s B] SUB [s B]SC.P
R[s B]HR.PR[s B]H/L TOG [s B]SCROLL[6"[L
EFT]" "CHR$(148)" ";
•40 WAIT198,1:GETG$:IFG$=""THEN40
•41 STOP
•42 REM *****
•43 REM PRINT AT ROUTINE
•44 REM *****
•50 PRINT"[HOME]";
•55 IFJJ<>0THEN POKE214,JJ-1:PRINT
•60 POKE 211,KK:RETURN
•65 REM *****
•66 REM ALTERNATE
•67 REM *****
•70 PRINT"[RVSON]MAIN [s B] SUB [s B]SC.P
R[s B]HR.PR[s B]H/L TOG [s B]SCROL [LEFT
]L";
```

REMFIX

If your renumber utility scans instead of skipping past the text of REM statements, you can make it "fix" any line numbers referred to in explanatory REMs simply by POKEing a GOTO token into an otherwise blank space preceding the target number. Put the text of the REM statement inside quotes to prevent the LIST command from expanding the token. Example:

```
299 H7=PEEK(61)+256*PEEK(62):POKE(PEEK(H
7+1)+256*PEEK(H7+2)+11),137
300 REM "LINE 470 CALCULATES FREQUENCY N
UMBER FOR VOICE ONE"
301 STOP
```

In the example, Line 300 is a permanent program line. Lines 299 and 301 are temporary and should be deleted after doing RUN 299. A renumber utility will now treat the number 470 in Line 300 exactly the same as any other GOTO destination line number. Note the important number 11 near the end of Line 299. It is a sort of index number that represents the location of the blank space, and may be different each time you use the procedure. You must make it equal to the number of characters that follow REM, over to and including the blank space, plus four. If your REM statement holds several line numbers to be fixed, simply make sure each is preceded by a blank space, change the index number in Line 299, and RUN

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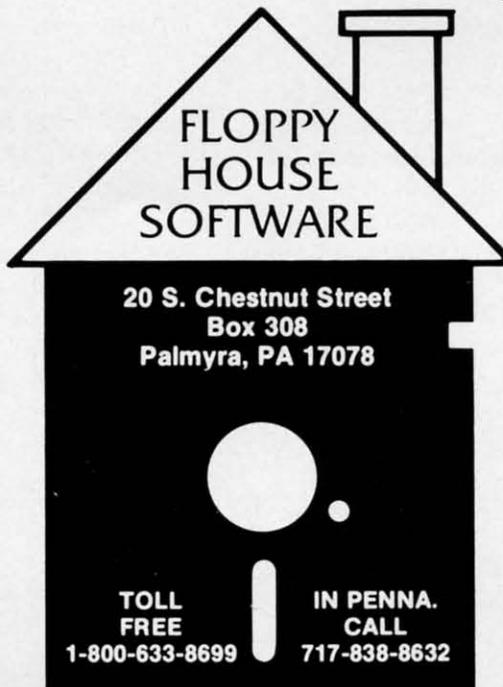
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it again.

—C.C. Stalder
Waynes, NC

LIGHTS OUT

If that flashing red light on the 1541 is trying your patience, turn it out—with *Lights Out*. *Lights Out* tells you what error crept into the 'ol disk drive and mercifully douses the light. It's easy to use and works with both the C-64 and VIC 20.

First load and run *Lights Out*. Now you can load and save all the programs you want. Whenever you need to read an error channel (because that red light won't quit winking at you), type SYS 980 and press RETURN. Presto, you'll see what went wrong, and the panic light will go out.

Lights Out loads into the cassette buffer from 980 to 1018. If necessary, you can relocate it by changing the variable for the starting address (SA), in line 30, to the new starting address. Be sure the new location has room for it (39 bytes). Everything else is automatic.

—Buck Childress
Salem, OR

```
•10 REM *** LIGHTS OUT *** BUCK CHILDRESS
  *** SALEM, OR 97309
•20 PRINTCHR$(147)"LOADING DATA":PRINT
•30 SA=980:REM CHANGE THIS TO RELOCATE
•40 FORJ=SATOSA+38:READA:POKEJ,A:X=X+A:NE
  XTJ
•50 IFX<>5736THENPRINT"ERROR IN DATA":END
•60 PRINT"DATA OK":PRINT:PRINT"SYS"SA"TO
  ACTIVATE":END
•70 DATA169,15,168,162,8,32,186,255,169,0
  ,32,189
•80 DATA255,32,192,255,162,15,32,198,255,
  32,207,255
•90 DATA201,13,240,5,32,210,255,208,244,3
  2,231,255,76,204,255
```

MONAID

Here is an 80 byte ML program, in the form of a BASIC loader, which adds a printer output command to the C-128's machine language monitor. Enter, save, and run *Monaid*. The program will POKE a short ML program into memory and then advise you to SYS 3504 to enable. Executing the SYS will cause you to enter the monitor with two extra commands available, P (printer on) and O (printer off). Selecting P will direct the output of all monitor commands to the printer. Selecting O turns the printer off and redirects output to the screen.

—Bob Ossentjuk
Sierra Vista, AZ

```
•3468 PRINT"[CLEAR][DOWN]LOADING MONAID D
  ATA, PLEASE WAIT"
•3480 FORX= 3504 TO 3583 :READA:CS=CS+A:P
  OKEX,A:PRINT".":NEXTX:PRINT
•3492 IFCS <> 9012 THENPRINTCHR$(7)"DATA
```

ERROR!":STOP

```
•3504 DATA 169,194,141,46,3,169,13
  ,141,47,3,32,125
•3516 DATA 255,7,0,76,33,176,201,
  80,240,7,201,79
•3528 DATA 240,36,76,6,176,32,125,
  255,7,13,0,169
•3540 DATA 0,141,0,255,32,189,255,
  169,4,170,160,1
•3552 DATA 32,186,255,32,192,255,1
  62,4,32,201,255,76
•3564 DATA 139,176,169,0,141,0,255
  ,169,4,32,231,255
•3576 DATA 32,125,255,7,0,76,139,
  176
•3588 PRINT"[DOWN][DOWN]SYS 3504 : REM TO
  ENABLE[3"[UP]]":NEW
```

REVERSE VIDEO

The Commodore 128 has a feature that turns the 80-column screen into reverse video when ESC and then R is pressed. This sounds impressive; however, when I purchased my system, I did not obtain the necessary accessories to produce 80-column output. Therefore, I wrote *Reverse Video* for my 40-column screen. It will turn anything that is reversed to non-reversed and anything that's non-reversed into reversed.

Below are totally relocatable versions for the C-128 in 40-column mode and the C-64. An SYS to the starting address will instantly perform the deed.

Note that the last three lines of the loader are there just to offer a quick example. —Shawn K. Smith
Bronx, NY

```
•1 REM REVERSE VIDEO BY SHAWN K. SMITH
•2 REM FOR C64 OR C128 IN C64 MODE....
•3 S=00830:FORD=STOS+20:READY:POKED,Y
•4 NEXT:PRINT"[RVSON]SYS"S" FOR REVERSE V
  IDEO!
•5 DATA 234,162,024,160,039,032,240,233
•6 DATA 177,209,073,128,145,209,136,016
•7 DATA 247,202,016,239,096
•9 FORD=0TO39:A$=A$+CHR$(32):NEXT:N=99
•10 FORD=1TO16:POKE646,D:PRINTA$;:NEXT
•11 FORT=1TON:FORD=1TON-T:NEXT:SYSS:NEXT
```

```
•1 REM REVERSE VIDEO BY SHAWN K. SMITH
•2 REM FOR C128 IN 40 COLUMN MODE ONLY
•3 S=5555:BANK (1+2+3+4+5):PRINT
•4 FORD=STOS+23:READY:POKED,Y:NEXT
•5 PRINT"[RVSON]SYS"S"[RVSOFF]FOR REVERSE
  VIDEO!
•6 DATA 165,215,208,019,162,024,160,039
•7 DATA 032,094,193,177,224,073,128,145
•8 DATA 224,136,016,247,202,016,239,096
•9 FORD=0TO39:A$=A$+CHR$(32):NEXT:N=99
•10 FORD=1TO16:COLOR5,D:PRINTA$;:NEXT
•11 FORT=1TON:FORD=1TON-T:NEXT:SYSS:NEXT
```

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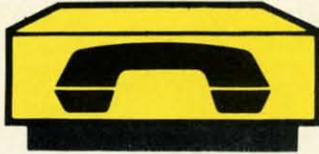


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By Dale Rupert

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PROBLEM #35-1: ROUND ABOUT

This problem was submitted by Bill Sinclair Jr. of Hurlock, MD. The user inputs a string, and the computer scrolls it counterclockwise in a marquee fashion around the outer perimeter of the screen. The string will start on the top line of the screen and crawl down the left side of the screen. As it moves across the bottom line of the screen, it will be in reverse order. Then it crawls up the right side, and the process is repeated. (Bill suggests that you more advanced programmers do this as a machine language interrupt routine so the message could be displayed during another program.)

PROBLEM #35-2: SERIES SEQUENCE

James Bickers (Shepherdsville, KY) suggested this problem for you baseball and/or permutations fans. In a seven-game World Series, games are played until one team has won four games. Write a program which displays all possible win/loss sequences for the winning team. A few possibilities are

W W W W
W W W L W
W L L W W W
L L L W W W W

Can your program be easily modified to handle any series of X wins out of Y (maximum) games?

PROBLEM #35-3: TIME CONVERTER

Jim Speers (Niles, MI) suggested this little challenge. The user enters a number of hours in decimal format, and the computer converts it to hours:minutes:seconds format. For example, 6.42135 becomes 6:25:17.

PROBLEM #35-4: BAD LUCK

Here is a possible application of the Date Ditty solutions discussed below. The user enters today's date, and the computer responds with the date of the next Friday the 13th. Good luck.

This month we will look at readers' solutions to *Commodares* from the July 1986 issue. *Problem #31-1: Date Ditty* brought numerous solutions. The problem was for the computer to give the day of the week for any date in the 1900's. A programming "ditty" is meant to be a small, single-purpose routine. The solutions ranged from very short programs that work for most days in the twentieth century to much longer programs that give valid results from the year 100 AD to 2099 AD.

One of the shortest programs is listed below, from Keith Kushner (Brooklyn, NY).

```
•1 REM COMMODORES PROBLEM #31-1:
•2 REM     DATE DITTY
•3 REM SOLUTION BY
•4 REM     KEITH KUSHNER
•5 REM
•10 REM -VALID FOR 1900'S AFTER 2/28/1900
•20 REM -ENTER JULY 4, 1986 AS 7,4,86
•30 REM
•40 FOR N=0 TO 6:READ D$(N):NEXT
•50 DATA SATURDAY,SUNDAY,MONDAY,TUESDAY,W
EDNESDAY,THURSDAY,FRIDAY
•60 INPUT"M,D,Y";M,D,Y:IF M<3 THEN M=M+12
:Y=Y-1
•70 N=D+2*M+INT(.6*(M+1))+Y+INT(Y/4)+3 :
N=INT((N/7-INT(N/7))*7+.5):PRINT D$(N)
```

Keith's program doesn't allow for the fact that the year 1900 was *not* a leap year, so January and February dates for that year are given as a day earlier than they should be. For example, January 1, 1900 was a Monday, not a

Sunday as the program says. Of course, it wouldn't take much effort to check for those two months and fix the program. Give it a try.

Most of the programs submitted allow the user to enter almost anything for the date. The following program from Karen Middaugh (San Diego, CA) adds error-checking to make sure that only valid dates are given.

```

•1 REM COMMODARES PROBLEM #31-1:
•2 REM     DATE DITTY
•3 REM SOLUTION BY
•4 REM     KAREN MIDDGAUGH
•5 REM
•10 DIM K(12):FOR I=1 TO 7:READ D$(I):NEXT
  T:FOR I=1 TO 12:READ K(I):NEXT
•20 INPUT "INPUT YEAR: 19";Y
•30 INPUT"INPUT MONTH (1-12): ";M :IF M<1
  OR M>12 THEN 30
•40 INPUT "INPUT DAY: ";D :IF M=2 AND D>2
  8 AND (Y/4<>INT(Y/4) OR Y=0) THEN 40
•50 IF (M=4 OR M=6 OR M=9 OR M=11) AND D>
  30 THEN 40
•60 IF D<1 OR D>31 OR (M=2 AND D>29) THEN
  40
•70 L=INT((Y+3)/4):DA=6+Y+L+K(M)+D :IF IN
  T(Y/4)=Y/4 AND M>2 THEN DA=DA+1
•75 IF Y=0 AND M<3 THEN DA=DA+1
•80 IF DA>7 THEN DA=DA-7 :GOTO 80
•90 PRINT M"/"D"/"Y" IS A "D$(DA)"DAY"
•100 DATA MON,TUES,WEDNES,THURS,FRI,SATUR
  ,SUN,0,3,3,6,1,4,6,2,5,7,3,5

```

Don't try to enter February 29, 1900 into this program. It allows only valid months and their corresponding days to be entered. The IF/THEN statement in line 40 determines if a date of 29 or greater is entered for February in a non-leap year. Notice that Y/4 is an integer for leap years. The Y=0 condition handles the special case that 1900, by definition or agreement, was not a leap year.

Line 50 implements the expression "Thirty days hath September, April, June, and November," and line 60 checks the other months. From line 40, a February date greater than 28 is allowed only in a leap year. Line 60 makes sure that any such date is not more than 29. The heavy work is done by line 70. Line 75 fixes the January, February 1900 dilemma discussed earlier. Line 80 implements the MOD 7 function. This line repeatedly subtracts 7 from a number until the result is between 0 and 6. Compare this line with the corresponding statement in line 70 of Keith's program:

$$N = \text{INT}((N/7 - \text{INT}(N/7))*7 + .5)$$

The repeated subtraction works fine but it can take quite a while if the original number is large.

There were nearly as many algorithms for calculating the day as there were programs submitted. The use of "month values" in Karen's program reminded me of the

discussion of this problem in Martin Gardner's book *Mathematical Carnival* (Vintage, 1977). Martin Gardner presents a procedure (originated by Lewis Carroll in 1887) by which anyone can mentally calculate the day of the week for any date. The procedure involves being able to "cast out 7s" and requires memorizing 12 simple month values. You too can amaze your friends with your mental prowess. The calculations can be performed in your head in less than 30 seconds with practice. Who needs a computer?

Doug Vanderploeg (Norwich, CT) sent a lengthy program which he claims will handle all dates from 01JAN 0100 to 31DEC2099. It takes into account the change to the calendar in 1752 made by Pope Gregory XIII in which 11 days were dropped. (The day after September 2, 1752 was September 14, 1752 in the English-speaking countries.) If you want a listing of Doug's program, send a legal size, self-addressed, stamped envelope to me with your request clearly stated. Look into Gardner's book or an encyclopedia for more information on calendars.

Problem # 31-2: Cryptic Math was just plain tedious. The problem was to find which permutations of the numerals 0 through 9 make this expression true: $AB * CDE = FGH * IJ$, where each letter represents a different numeral. There are only 10! (ten factorial) possibilities, since there are ten choices for A, nine choices for B once A has been picked, eight choices for C, and so forth. The total is $10*9*8*7*6*5*4*3*2*1$ or 3,628,800.

Congratulations to Dennis McGrath (Cicero, IL) who wrote his first major program in COMAL 2.0 to solve this problem. He realized that BASIC was not going to be fast enough. Dennis' four page (double spaced) program found 198 solutions in an elapsed time of 2,505,027 jiffies. That translates to just under 12 hours. Send me a legal size, self-addressed, stamped envelope if you are interested in seeing Dennis' COMAL solution. He found the high product to be 58560 ($80*732 = 915*64$) and the low product to be 3588 ($23*156 = 897*04$).

Paul Sobolik (Pittsburgh, PA) wrote the following BASIC program, based upon the permutation scheme from Allan Flippin in the April 1986 *Commodares*.

```

•1 REM COMMODARES PROBLEM #31-2:
•2 REM     CRYPTIC MATH
•3 REM SOLUTION BY
•4 REM     PAUL SOBOLIK
•5 REM
•10 CLR : DIM C(9) : S$="9876543210"
•20 J=9
•30 W=VAL(LEFT$(S$,2)):X=VAL(MID$(S$,3,3)
  )
•40 Y=VAL(MID$(S$,6,3)):Z=VAL(RIGHT$(S$,2
  ))
•50 IF W*X=Y*Z THEN PRINT W"*"X="Y"*"Z
•60 S$=LEFT$(S$,J-1)+RIGHT$(S$,10-J)+MID$(
  S$,J,1)
•70 C(J)=C(J)+1 : IF C(J)<=10-J THEN 20
•80 C(J)=0 : IF J>1 THEN J=J-1 : GOTO 60

```

Add line 55 PRINT W,X,Y,Z to see how the program works. After running this program, Paul realized why people go out and buy Cray-2 supercomputers. Paul's program had churned out only 27 solutions in over 19 hours of running when he took the philosophical attitude that "the problem is solved, so who cares about the solution?" At that rate, the program would be done in less than 6 days. Evidently Paul had better things to do with his computer. Congratulations also to David Shiloh (Eugene, OR) for his work on this problem.

In the April 1984 *Rupert Report*, I calculated that the C-64 BASIC has a speed of roughly 0.0002 megaflop/second. This is the number of "million (mega) Floating-point Operations (flop)" the computer can perform each second. One of my references gives the CDC Cyber 205 supercomputer a rating of 25 megaflop/second. Just to put this into perspective, Paul's six-day program on the 64 should take under five seconds on the Cyber 205. That's why people use supercomputers. (To put things further into perspective, what do you suppose *your* megaflop/second rating would be, even with a calculator?)

Problem #31-3: Farm Figures from Vern Leween (Brantford, ONT) brought a whole herd of solutions. With \$10 cows, \$3 sheep, and 50¢ pigs, the task was to buy exactly 100 head of livestock (including at least one of each) for exactly \$100. The most straightforward solution is represented by this COMAL program from Sol Katz (Lakewood, CO):

```

•1 REM COMMODARES PROBLEM #31-3:
•2 REM     FARM FIGURES
•3 REM COMAL SOLUTION BY
•4 REM     SOL KATZ
•5 REM
•10 :FOR C=1 TO 98 OPEN
•11 : FOR S=1 TO 98 OPEN
•12 :  FOR P=1 TO 98 OPEN
•13 :   IF C+S+P=100 AND (C*10)+(S*3)+(P*
      .5)=100 THEN
•14 :     PRINT"PIGS, COWS, SHEEP =",P,C,S
•15 :     STOP
•16 :     ENDIF
•17 :   ENDFOR P
•18 : ENDFOR S
•19 :ENDFOR C

```

Sol and most others did some additional pre-computation figuring in order to simplify and accelerate their programs. An easy calculation shows that no more than 9 cows or 29 sheep can be bought if there is to be at least one of each animal within the \$100 limit. Also, if C is the number of cows, and S is the number of sheep, then the number of pigs must be $100 - C - S$. The tiny program from Keith Kushner (Brooklyn, NY) nicely implements this insight.

```

•1 REM COMMODARES PROBLEM #31-3:

```

```

•2 REM     FARM FIGURES
•3 REM SOLUTION BY
•4 REM     KEITH KUSHNER
•5 REM
•10 FORC=1TO9:FOR S=1TO29:P=100-(C+S):ON-(
  C*10+S*3+P*.5=100)GOSUB20:NEXTS,C:END
•20 PRINT C;"COWS";S;"SHEEP";P;"PIGS" :RE
  TURN

```

Keith's ON/GOSUB statement in line 10 merits some discussion. It contains the logical expression $(C*10 + S*3 + P*.5 = 100)$ which the computer interprets as either True (equal to -1) or False (equal to 0). This expression compares the cost of the animals with \$100. If the cost does not equal \$100, the expression is False. Negative zero is zero, and the ON/GOSUB statement falls through to the NEXT S,C statement. If the expression is True, the negative of -1 is 1, and the ON/GOSUB statement branches to the first line number following the GOSUB, namely line 20.

The advantage of using this ON/GOSUB statement is that other statements may follow it in the same program line. The alternative is to use the standard IF/THEN statement which would require an additional program line for the NEXT S,C and END statements. As a simple example, in the line

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10 IF A=B THEN GOSUB 50 : PRINT A

the PRINT statement is executed only when A=B, since the remainder of the line is skipped when the IF condition is false. If the PRINT statement is to be executed every time line 10 is reached, we must rewrite line 10 and add another line:

10 IF A=B THEN GOSUB 50
15 PRINT A

These two lines can be reduced to one as follows:

10 ON -(A=B) GOSUB 50 : PRINT A

The only disadvantage of this method is the relative obscurity of its operation. This concept can be further extended if the program should temporarily branch to one of two different places depending upon the equivalence of A and B. For example,

10 ON 1-(A=B) GOSUB 50,60 : PRINT A

Now if A does not equal B, 1-(A=B) has a value of 1, and the program branches to line 50. If A equals B, 1-(A=B) has a value of two since (A=B) is -1, and the program branches to line 60. In either case, execu-

tion returns to the PRINT A statement after the appropriate subroutine is completed.

After Paul Sobolik (Pittsburgh, PA) finished figuring that no more than 9 cows or 29 sheep could be bought, he went a step further and thought, why not do some additional pre-computing and make the program as short as possible? His result is essentially this:

10 PRINT "BUY 5 COWS, 1 SHEEP, AND 94 PIGS"

Sure enough, his program gives the right answer!

Problem #31-4: Repeated Compression from Thomson Fung (San Diego, CA) was a fun challenge for many readers. The problem was to input a string and compress any multiple characters into single ones. For example, "ttteeeessstt" becomes "test." You might think that such a simple problem would not allow for much creativity, but Commodores fans are not your ordinary thinkers.

The shortest solution is this one-liner from Keith Kushner (Brooklyn, NY):

```
• 1 REM COMMODARES PROBLEM #31-4:
• 2 REM REPEATED COMPRESSION
• 3 REM SOLUTION BY
• 4 REM KEITH KUSHNER
• 5 REM
• 10 INPUT I$: FORT=1TOLN(I$): A$=MID$(I$, T,
  1): C$=C$+CHR$(ASC(A$)*-(B$<>A$)): B$=A$: N
  EXT: PRINT C$
```

You must use abbreviations to fit this on one C-64 line. Keith builds the string C\$ by adding either the next letter or the null character CHR\$(0) depending upon whether the current letter in A\$ matches the previous letter which is in B\$. Refer to the discussion above about logical expressions to see how the CHR\$() value is determined. If the current letter is different from the previous letter, (B\$<>A\$) is true and has a value of -1, otherwise the expression has a value of 0. Since CHR\$ and ASC are inverse functions, CHR\$(ASC(A\$)*-(-1)) equals CHR\$(ASC(A\$)) which is just A\$, and CHR\$(ASC(A\$)*-(0)) is CHR\$(0).

Timothy Williams (Henderson, KY) uses magic in his solution to this problem listed below.

```
• 1 REM COMMODARES PROBLEM #31-4:
• 2 REM REPEATED COMPRESSION
• 3 REM SOLUTION BY
• 4 REM TIMOTHY W. WILLIAMS
• 5 REM
• 10 INPUT A$: FORA=1TOLN(A$): B$=MID$(A$, A,
  1): PRINT B$; : IFC$=B$ THEN PRINT CHR$(20);
• 20 C$=B$: NEXT
```

The magic is CHR\$(20), the delete character. Enter a string with many repeated characters and watch the duplicates vanish before your very eyes.

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Gary Hudach (Youngstown, OH) added some animation to his disappearing letters magic show.

```

1 REM COMMODARES PROBLEM #31-4:
2 REM REPEATED COMPRESSION
3 REM SOLUTION BY
4 REM GARY HUDACH
5 REM
10 U$=CHR$(145):INPUTA$:B$=CHR$(32)+A$:P
RINTU$" "B$:FORT=2TOLLEN(B$)
20 IFMID$(B$,T,1)=MID$(B$,T-1,1)THENPRIN
TU$SPC(T)CHR$(32):FORX=1TO200:NEXT
30 IFMID$(B$,T,1)<>MID$(B$,T-1,1)THENC$=
C$+MID$(B$,T,1)
40 NEXT:FORA=1TOLLEN(C$):PRINTU$SPC(A)MID
$(C$,A,1)
50 FORB=LEN(C$)TOLLEN(B$):PRINTU$SPC(1+B)
CHR$(32):NEXTB,A

```

You must not enter a string longer than one screen line for this program to work properly.

Buck Buchanan (of parts unknown) sent a BASIC solution and a functionally equivalent COMAL solution to this problem. COMAL can treat strings as arrays of single characters. Consequently some of the string operations are easier in COMAL. For example, these BASIC statements:

```

10 IF MID$(CI$,J,1)<>MID$(CI$,K,1) ...
20 CF$ = LEFT$(CF$,N-1) + MID$(CI$,J,1)
+ MID$(CF$,N+1)

```

are equivalent to these COMAL statements:

```

10 IF CI$(J)<>CI$(K) ...
20 CF$(N) = CI$(J)

```

Line 10 compares the Jth character to the Kth character in CI\$. Line 20 replaces the Nth character in CF\$ with the Jth character in CI\$. Line 20 in BASIC 7.0 may be written as

```
20 MID$(CF$,N,1) = MID$(CI$,J,1)
```

Jim Speers didn't like the idea that "SSPPPEEERRSSS" was compressed to "SPERS." His modification allows double letters to be included as long as they are separated by "/".

```

1 REM COMMODARES PROBLEM #31-4:
2 REM REPEATED COMPRESSION
3 REM SOLUTION BY
4 REM JIM SPEERS
5 REM
10 INPUT"ENTER TEXT";X$:P$=LEFT$(X$,1)
20 FORI=2TOLLEN(X$):IFMID$(X$,I,1)=MID$(X$,I-1,1)THEN40
25 IFMID$(X$,I,1)="/"THEN40
30 P$=P$+MID$(X$,I,1)
40 NEXT I:PRINT P$

```

Line 25 of the program checks for the separation character. Now he can enter "SSPPPEEE/EEERRRRSS" and the computer responds with "SPEERS." Without running this program, can you predict the result of having several consecutive /s?

Thanks and congratulations this month to the following people not already mentioned who wrote with challenges and solutions:

- | | |
|--------------------------------|--------------------------------------|
| Tim Bauer (Sapulpa, OK) | William Ballance (Jacksonville, NC) |
| Eric Biberhofer (Dundas, ONT) | Raymund Eich (Marshfield, MO) |
| Kent Black (Kountze, TX) | Richard France (Red Bank, TN) |
| Sean Connor (Melfort, SASK) | Robert Frazier (San Diego, CA) |
| Bo Cordle (Leesburg, FL) | W.T. Mallison (Rocky Mount, MC) |
| Charles Grady (Cleveland, TN) | Michael Marron (Stony Brook, NY) |
| J.P. Grandbois (Hanmer, ONT) | M. Mottel (LaGrange Highlands, IL) |
| David Hoffner (Brooklyn, NY) | Milum Perry, Jr. (Monterey, CA) |
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Special thanks to Pol Magermans who sent *Commodares* solutions all the way from Verviers, Belgium.



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PROMAL: A Look at a Programmer's Language

By Cheryl Peterson

So far in this three-part series, we've compared Commodore BASIC, Pascal, and COMAL. We've seen that Pascal is very structured, while COMAL and BASIC can be structured but don't have to be. In this final installment, we take a look at another structured language. It is, in fact, as rigid as Pascal.

PROMAL (PROgrammer's Micro Application Language) was designed for programmers who want to sell their end product. It comes in two versions: one for commercial developers and one for those who plan to use their programs only for themselves. There is no royalty or fee charged for selling programs you write using the developer's system.

PROMAL programs must be compiled before they are

run on the function keys, both of these are fairly easy to use.

GETTING DOWN TO PROGRAMMING

PROMAL programs are structured similarly to Pascal programs. Each program must start with a program name and variables must be declared before being used. Procedures and functions are defined at the beginning. As with Pascal, PROMAL procedures and functions are called by name from within the body of the program.

PROMAL contains many of the same statements and commands as Pascal, but there are some major differences (see accompanying list of reserved words). One of these is the handling of I/O routines. In the language itself, there is no

PROMAL RESERVED WORDS

Commands

AND	CHOOSE	FUNC	OR	TO
ARG	DATA	IF	OWN	TRUE
ASM	END	INCLUDE	PROC	UNTIL
AT	ELSE	INT	PROGRAM	WHILE
BYTE	ESCAPE	LIST	REAL	WORD
BEGIN	EXT	NEXT	REFUGE	XOR
BREAK	FALSE	NOT	REPEAT	
CON	FOR	NOTHING	RETURN	

Data Types

BYTE	INTEGER	CONSTANT	DATA	PROCEDURE
WORD	REAL	VARIABLE	FUNCTION	PROGRAM

Other Names

run. A deficit of using a compiler-based program is having to recompile during the debugging process. If you have errors in your program, you have to reload the program into the editor, make any changes, leave the editor, and then recompile. This process must be repeated until all the mistakes are found. In some cases, even if the compiled program runs, errors can still occur. Finding these runtime errors is even more difficult than finding compile errors.

Knowing that the language is a bit more difficult to use than a non-compiled language, why would anyone choose it? Because the compiled programs run much faster than those written in interpreted languages like BASIC and COMAL. They also occupy less disk space. The end user does not need a copy of PROMAL to run the programs. And once the program is compiled, it is difficult for the end user to examine or modify the program, making it ideal for commercial programs.

PROMAL includes an editor and what is called the executive. The editor is used to type in your programs. The executive handles disk functions, other I/O (input/output) operations, and compiling. With the commands included

PRINT or its equivalent. Instead, several routines found in a library on the disk control this type of activity. Designed as procedures and functions, the library contains routines corresponding to the more complicated Pascal or BASIC commands. Because of this, one of the first lines in many programs will be INCLUDE LIBRARY. Our sample program will demonstrate the use of a couple of these library procedures.

Another major difference is the handling of strings. You can use literal strings to output text messages to the screen, but there is no variable type designed to handle strings. Instead, you must designate an array of type BYTE to hold any strings you wish to manipulate within the program. Although the data type WORD would seem appropriate to hold string variables, PROMAL defines WORDs as unsigned integer numbers between 0 and 65,535. This does give a little more flexibility than many other Commodore languages that have trouble handling integers over 32,767. However, it doesn't help with string manipulation.

SYNTAX DIFFERENCES

In PROMAL you are limited to one statement per line.

PROGRAM LABELS

INCLUDE LIBRARY

WORD LINES
WORD PASSES
WORD X
WORD Y
WORD P
WORD R
BYTE NAME[21]
BYTE ADDRESS[41]
BYTE CITY[21]
BYTE ST[3]
BYTE ZIP[19]
BYTE BUF[81]
BYTE INDEX
BYTE W

PROC LABELFORMAT

```
BEGIN
PUT "How many lines per label?",CR
GETL BUF
INDEX = STRVAL(BUF,#LINES)
END
```

PROC PRINTNUMBER

```
BEGIN
PUT "How many labels to print?",CR
GETL BUF
INDEX = STRVAL(BUF,#PASSES)
END
```

PROC READDATA

```
BEGIN
PUT "Enter full name--20 characters or less.",CR
GETL NAME,20
PUT "Enter address--40 characters or less.",CR
GETL ADDRESS,40
PUT "Enter city--20 characters or less.",CR
GETL CITY,20
PUT "Enter 2 character state code.",CR
GETL ST,2
PUT "Enter zip code--9 characters or less.",CR
GETL ZIP,9
END
```

PROC PRINT

```
BEGIN
R = OPEN("P","W")
FOR X = 1 TO PASSES
  OUTPUTF R, "#S#C", NAME
  OUTPUTF R, "#S#C", ADDRESS
  OUTPUTF R, "#S ", CITY
  OUTPUTF R, "#S ", ST
  OUTPUTF R, "#S ", ZIP
FOR Y = 1 TO LINES
  PUTF R, CR
CLOSE R
END
```

BEGIN

```
LINES = 0
PASSES = 0
```

```
LABELFORMAT
PRINTNUMBER
READDATA
LINES=LINES-3
X = 1
Y = 1
PRINT
END
```

PROMAL SELF- ADDRESSED LABELS

There is no punctuation needed at the end of lines. A semicolon is used to designate a remark. In a line containing a semicolon, everything after the semicolon is ignored.

PROMAL's variables and other identifiers can have up to 31 characters, all of them significant, unlike BASIC which only looks at the first two characters. Although PROMAL's reserved words cannot be used as variables, they can be used within variables. For instance, TON is a legal variable even though it contains the reserved word TO. When compiled, these variables use no more memory than short variables, so highly descriptive variables aren't a liability.

Procedures and functions start with a name, followed by a BEGIN and then any local variables or definitions. Any looping segments are indented. Looping commands include IF/THEN, FOR, REPEAT/UNTIL, WHILE, and CHOOSE. The CHOOSE statement is similar to Pascal's CASE. Functions and procedures end with an END statement.

UNIQUE COMMANDS

PROMAL has two unique statements available. ESCAPE allows you to jump out of a procedure or function if a problem is detected or you need to exit early. REFUGE is the place to which the program jumps. You are allowed up to three refuge locations. This is the closest to a GOTO that you will find in PROMAL.

OUR SAMPLE PROGRAM

In order to stay consistent with the other segments of the series, we'll once again create our self-addressed labels program, this time using PROMAL (refer to listing at left). As in past installments, we'll use our four subroutines: labelformat, printnumber, readdata, and print. Since PRINT is not a reserved word in PROMAL, we are free to use it as a procedure name.

We start with the program name and then use the INCLUDE LIBRARY command, because we will need the library procedures for I/O. Next we have a lot of variables to declare.

You'll remember that WORDs are integers from 0 to 65,535. By defining some variables as WORDs, we prevent the use of negative numbers. LINES is used to hold the number of lines per label. PASSES holds the number of labels to print. X, Y, P, and R are used in the print procedure.

Since strings must be contained in arrays, we define NAME, ADDRESS, CITY, ST, ZIP, and BUF as being of type BYTE and follow each with the number of characters to be held. BUF is a temporary storage area, which we'll detail when we get to the procedures that use it. INDEX is used in conjunction with BUF.

There's a little idiosyncrasy of PROMAL that you should know. In the declaration of the length of the array you must add one extra space for an end of array marker. This means that instead of declaring an array with two spaces for our state code, we must use three. You would not believe the headache that will result if you forget this. So remember it if you intend to use PROMAL at all.

The labelformat procedure uses the PUT procedure (found in the library that we included earlier) to print our prompt on the screen. GETL is short for "get line," and this we use to get the number of lines per label. GETL works similarly to INPUT in BASIC. One of the peculiarities of

PROMAL is that getting numbers (as opposed to letters) requires an extra step.

The input must be buffered and then converted to a number value using the STRVAL function (also found in the library routine). This function is a bit difficult to understand. If you remember the Pascal column, I mentioned that you "evaluate a function and execute a procedure." We would expect STRVAL to return the numeric value of the buffered characters. Instead, it returns the memory location where the value is stored. This adds an extra variable to our function.

INDEX is the variable (must be a BYTE variable) that points to where the value of LINES is stored. The function does store the value that we need in the variable LINES, so we can use that value later. It just goes about it a little strangely.

The printnumber routine uses the same function to obtain the PASSES value.

The readdata procedure uses the PUT and GETL procedures to obtain our values for NAME, ADDRESS, CITY, ST, and ZIP. While we defined our variables at the beginning and set the number of characters for our arrays, we must follow the variable name in each GETL statement with a comma followed by the number of characters of input to accept. This limits the input to prevent us from overrunning the variable's capacity.

The print procedure is a bit complicated. The R variable is used to designate a path for information flow. In this case, we open a channel to the printer ("P") in write access ("W") mode. We then use our two FOR loops to output each label's information the required number of times. Lastly, the procedure closes the channel to the printer.

There are two commands that can be used to send the information to the printer: OUTPUTF and PUTF. OUTPUTF allows a little more flexibility as to how the information is printed out. In the OUTPUTF statements you'll notice the #S and #C designators. These identify how the information is to be printed. #S stands for "print as a string of characters." #C stands for "print a carriage return." There are other designators for printing as a signed real number, an unsigned real number, or an unsigned integer value.

Unlike BASIC, PROMAL does not automatically end each printed line with a carriage return. Instead, these are added individually as needed. Notice the ,CR at the end of our prompt lines in the readdata procedure, for instance. In our OUTPUTF statements we must also add the carriage returns.

That covers the procedures used. The main body of the program sets the LINES and PASSES variables equal to 0. It calls the labelformat, printnumber, and readdata procedures. Before it can print the labels, we need to reduce the number of lines per label by three. As you recall, we use the variable LINES to determine the number of carriage returns we must place after our data to take us to the top of the next label.

In PROMAL, until you set a variable it contains a "garbage" value. So we must set X and Y equal to one before we execute our print procedure. This could have been done just below where we set LINES and PASSES equal to zero, but I was feeling lazy. That leaves only executing the print procedure, and the program's done.

NEXT MONTH

With next month's column heralding the approach of

Christmas, I'd like to take a look at some nice presents you might want to buy for your computer. After all, you'll be buying presents for all your friends and relatives. While I've had my computers long enough to think of most of them as relatives, even those of you have only had yours a short while should have gotten a friendship started by now.

If there are any comments you'd like to make about the *Cadet's Column* or any criticisms you'd like to voice, send a letter via *Ahoy!* or stop in the two rooms where I hang out on PlayNET. The *For Starters* room is intended to help those who are just starting to use their computers, although we'll gladly answer any questions that come up. It's currently open on Sunday nights. My room, *Cherp's Library*, is open on Friday and Tuesday nights. If you need help finding articles or books on any particular topic, stop in and I'll check my collection and see what I can recommend. And don't forget the *Ahoy! Port of Call* on Saturday (moved from Thursday) nights. □

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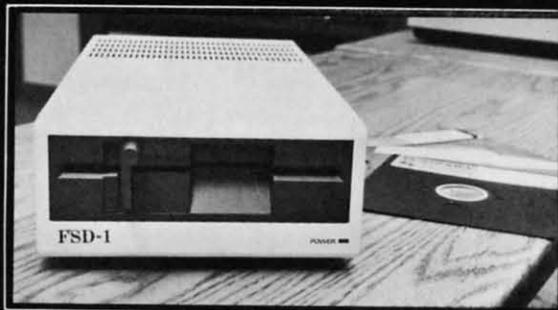
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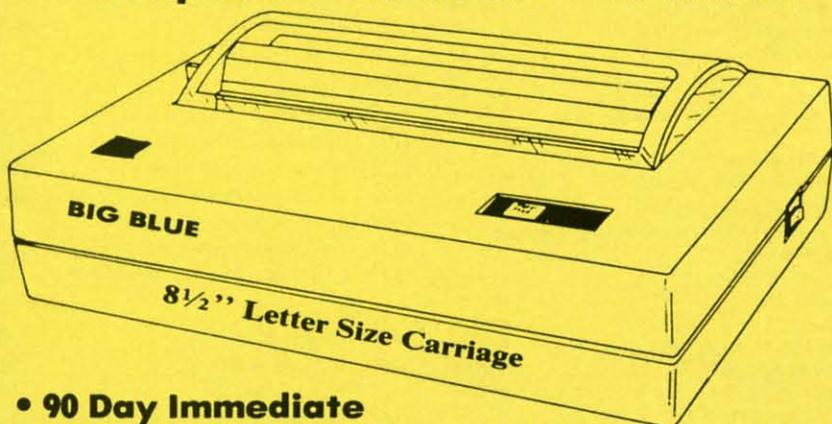
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2160	Sargon II (D)	\$9.95
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5022	Word Writer (D)	\$49.95
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5026	SwiftCalc/Sideways (D)	\$49.95

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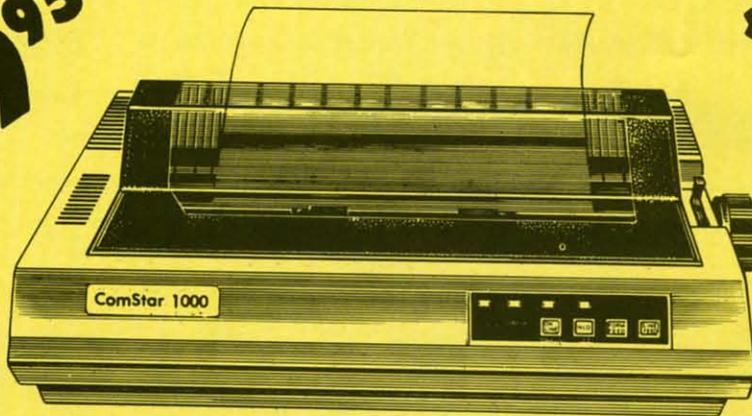
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The Comstar 1000 is one of the best values in the United States today. Print your letters, documents, programs, pictures, and more at a blazing 100 Characters Per Second or 20 cps in the Near Letter quality mode. (Looks just like it came from a typewriter.) Plus, choose your printing mode (NLQ, Draft) from your wordprocessor or by simply pushing the controls on the front panel. Fantastic Quality at a Fantastic Price. List \$349.00 SALE \$179.95.

Print Method

Serial impact dot matrix (9 pin)

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Draft- 100 CPS NLQ- 20 CPS

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96 ASCII Characters, Marker, Symbols (Includes Italic font)

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Approx. 10 lbs

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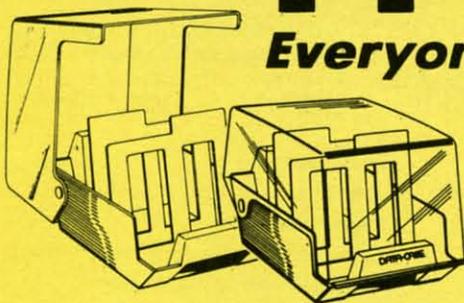
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Facts:

- Dust and Dirt particles can hurt your disks
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The Floppy Disk Filer is an inexpensive hard plastic flip-top case that will allow for easy filing, and protect your disks from dust, smoke, and dirt. Plus, the Floppy Disk Filer will keep all your disks out of unwanted hands and in one place where you can easily find them. (Holds Over 50 Disks)

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Keys/characters	44/96
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Good quality 5¼" single sided double density with hub rings.			
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CADILLAC QUALITY (Double Sided, Double Density) *Specifically designed for use with C-128*
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0029 Paper Economy Sleeves (10) 50¢

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PARTY QUIZ ONLY \$14.95

Trivia Controller & Software

Discover a better way to learn while you play, at a new, low price. Learning and entertainment are probably the reasons you bought a home computer. We've created a new, unique hardware/software system, like nothing ever produced for home computers, that satisfies those two motivations. It's called PQ, The Party Quiz Game. Included in each package are four special controllers (one for each player), a program disk and General Edition 1 disk containing 2700 questions covering a variety of subjects. PQ's Question / Answer Library (6 optional packages) expands the total number of questions to over 18,000. PQ asks the players a question; all are allowed to respond at once. Points are awarded for correct answers which are displayed on screen after a time elapses. All age and education levels, from reading age on up, can play thanks to PQ's "handicap" feature. Find out for yourself why Party Quiz gets 4 star ratings. List \$49.95. **Sale \$14.95.**



PQ's four exclusive Quick Response™ controllers free players from keyboard captivity.

Additional Trivia Software Modules

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Education Edition	\$39.95	\$12.95
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Without Tying Up Your Computer

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Free Lamp Module (\$19.95 value) with purchase of X-10 computer interface.

The X-10 POWERHOUSE Computer Interface is programmed from your Commodore 64 or 128. You can then turn off your computer or use it for something else. It does not tie up your computer. The software shows a graphical representation of your home and allows you to select a room, then select a light or appliance to be controlled, all just by pointing with the joystick. The interface sends digital signals over your existing house wiring to control your lights and appliances which are connected to plug-in modules (sold separately) List \$99.95. **Sale \$49.95.**

It can wake you up to stereo or TV news. Light up your bedroom, hallway, bathroom. Start the coffee, start your central heating or air conditioning, warm up the curlers, all before you even get out of bed. But it's smart enough not to wake you up on weekends. At night it can lower the heat, play music or your favorite late night TV show for as long as you want, and can first dim and later turn out the lights automatically.

Many types of modules are available including appliance modules for TV's, hi fi's, coffee pots, etc. Lamp modules which contain a dimmer and can be used for incandescent lamps up to 300 watts. Wall switch modules which also contain a dimmer and can be used for incandescent outside lights and ceiling lights of up to 500 watts. 220V heavy duty appliance modules for 220V air conditioners and water heaters. The thermostat controller for central heating and air conditioning. The 3 way wall switch for controlling incandescent lights operated by two switches. The heavy duty wall receptacle module to replace your existing wall receptacle, etc.

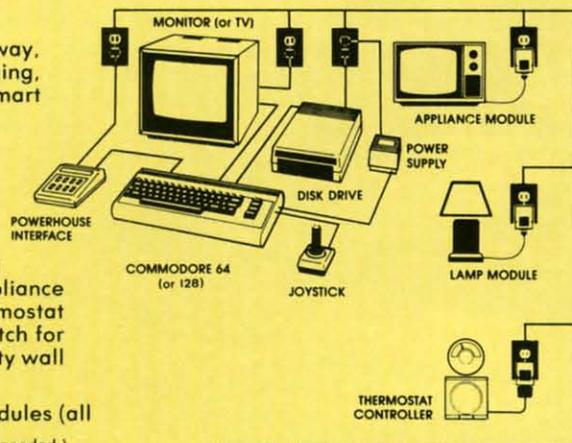
Plus, works with BSR, GE, Leviton, Radio Shack, and Sears Roebuck modules (all 256 codes addressable).

(Price does not include modules, please order modules as needed.)

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	List	Sale
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C64 & C128

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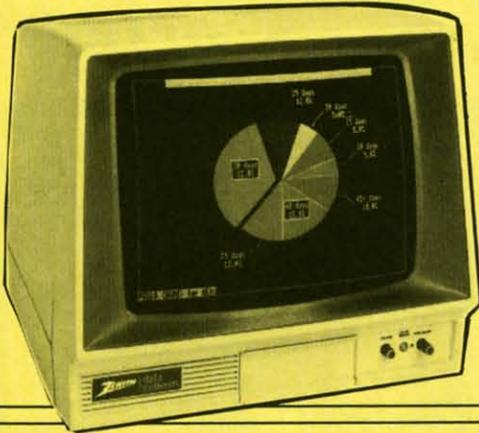
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Reduce eye fatigue by increasing the clarity of your TV or monitor screen. This kit contains a hard wax formulation to cover surface imperfections on TV screens and monitors. This restores maximum optical clarity, making what you see more distinct. Plus high absorbency cloths and an auto static spray cleaner allows you to clean your screen on a regular basis to keep your screen looking better than new. (This is a must for those who watch monitors or TVs for extended lengths of time.) List \$19.95. **Sale \$9.95.**

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Sale \$9.95

- 60% of all drive downtime is directly related to poorly maintained drives.
- Drives should be cleaned each week regardless of use.
- Drives are sensitive to smoke, dust & all micro particles.
- Systematic operator performed maintenance is the best way of ensuring error free use of your computer system.

This unique twin slot jacket design gives twice as many "wet-dry" cleanings per rotation as other leading brands. Non abrasive, 100% lint free, random fiber cleaners capture dust, smoke particles and disk oxide build up which insures you against disk and data loss from dirty disk drive heads just like you must clean your albums and tape players you must clean your disk drive heads to keep your disk drive working well. (24 cleanings per kit.) List \$19.95. **Sale \$9.95.**



ANTI-STATIC KEYBOARD CLEANER **Sale \$9.95**

Now you can clean your computer keyboard fast, efficiently, and safely. The keyboard cleaning solution is exclusively formulated to remove skin oils, dust, and dirt that can destroy your equipment. Plus this non residue solution with anto-static properties will not build up like ordinary household cleaners so you can clean as much as you like without worry. Plus the lint free, high absorbency, non-abrasive cloths will not scratch or mar your equipment as they pick up dirt and grime in a matter of seconds. List \$19.95. **Sale \$9.95.**

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(Premium Quality)

- Beautiful Color Contrast
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- Sharp Clear Text
- Anti-Glare Screen
- 40 Columns x 24 Lines
- Front Panel Controls

List \$329⁰⁰

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80 Columns RGB
Super High Resolution

13" Color Computer Monitor¹

*C64/Atari composite cable \$9.95
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14" RGB & Composite Color Monitor

Allows use of C-128 and C64 mode - composite and 80 column RGB mode. Must be used to get 80 columns in color with 80 column computers. Specially designed for use with the C128's special composite video output, plus green screen only option switch. (add \$14.50 shipping)

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Super high resolution composite green or amber screen monitor. 80 columns x 24 lines, easy to read. Fantastic value. Limited Quantities.

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Turn Your Monitor into a TV Set Without Moving Your Computer

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DesignWare

Commodore 64
SALE

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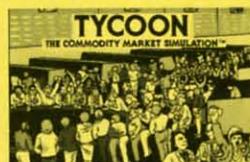
European Nations and Locations — An exploration of the continent that combines important facts and information in a challenging game format. The only European geography program that allows you to add questions of your own. If you miss a question during game play it is recycled to guarantee learning. Each game, you move nations to the proper location on a map of Europe. The map fills in with color as questions are correctly answered. Fast answers are rewarded with bonus points. Winner of the Parents Choice Award. (Disk)

List \$44.95 **SALE \$26.95**



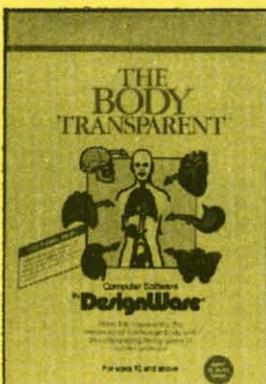
Tycoon — It takes an individual with loads of confidence and driving ambition, to deal in the commodities marketplace. To foresee market trends and develop a plan of action before trading, are talents that can make or break you as you deal in precious metals, oil, grains and other items of necessity. Armed with charts and details from real-life situations of the past, you can research the market and make your move accordingly. The element of risk makes the game play a real challenge for all aspiring tycoons, or even established entrepreneurs. (Disk)

List \$29.95 **SALE \$16.95**



The Body Transparent — Learn basic anatomy as you play a game of facts and functions of the human body. Choose a male or female body and move bones and organs to their location. Then learn what the body parts perform. Find out where food is digested, the importance of kidneys and much much more. Add your own biology questions to help make homework fun or to challenge a friend. The game has multiple difficulty levels and bonus points for fast answers, plus color graphics. (Disk)

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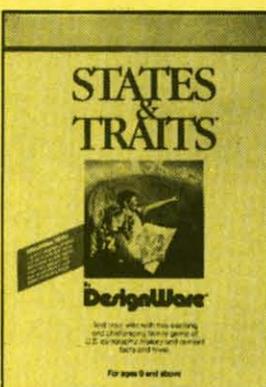
Baron — If you were given the opportunity to invest in real estate with a complimentary sum of money, say \$35,000 and a time limit of 52 game -weeks to turn that into a million, how would you proceed? Baron is a program that offers you the chance to find out what your chances of success in this complicated venture will be. You must utilize the allocated funds wisely in buying, selling and developing land because real life influences like fluctuating mortgage rates and other headaches that affect property owners will be apparent during play. It's challenging and risky to win the title of Baron (Disk)

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States & Traits — A valuable learning tool for geography and history students. Learn basic geography and then go on to find out interesting facts about every region in the country. Find out where historical events happened on the map. As you play quick answers are rewarded with bonus points. In the "States" part of the program you must move states into the right place on the map and the state lights up in bright color. In "Traits" you identify state capitals and landmarks. You can also design your own games (Disk)

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Millionaire — Put yourself in high gear and join the risk takers, because you are about to experience the New York Stock Exchange. To get you started in investments you are given \$10,000 and 154 stocks from 5 industry categories, the rest is up to you. Learn the market as you are faced with influences based on true to life events, good judgement is essential to whether you buy or sell and the status of your personal portfolio depends on making the right choices. The play includes an introduction to buying-on-margin, call options, put options and borrowing against your net worth. (Disk)

List \$29.95 **SALE \$16.95**



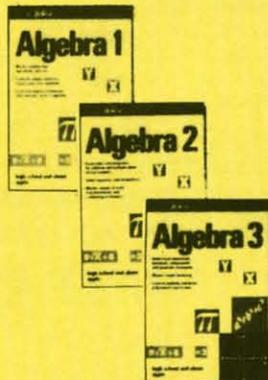
Commodore 64
SALE

EduWare

Commodore 64
SALE

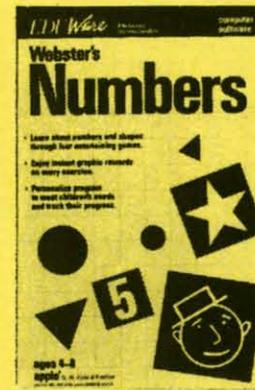
Algebra 1, 2, or 3 — An introduction to Algebra concepts and definitions. Helps students master the fundamentals of first year Algebra, addition of real numbers, multiplication of real numbers, solving equations, solving inequalities and absolute value sets. Students can learn in 4 ways: They can work the sample problems, read discussions of concepts, watch equations being solved, or study rules that govern mathematic operations. The result is that the student creates a learning process that he or she is most comfortable with. (Disk)

List \$39.95 **SALE \$19.95**



Webster's Numbers — Introduce your young children to basic arithmetic concepts with this program that combines lively animation with four action games. For children with minimal reading skills, they will learn shape discrimination, eye-hand coordination, number recognition and sequential counting to name just a few. Children will delight in maneuvering a hot air balloon, leading a mosquito to safety and pushing blocks and triangles into different shapes. (Disk)

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☆☆ **Britannica Learning Companies** ☆☆

C64

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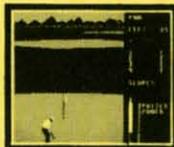
C128

Access Software

Best Multi Level Graphics Games in the U.S.A.



No. 1 Golf Game



Leader Board — This is not just another golf program, it is the most realistic one on the market because it is really a simulator that allows true perspective of the game. Three levels of play take you from beginner to pro. The courses are difficult and require concentration to come in under par. (Disk) List \$39.95. **Sale \$23.95. Coupon \$22.95.**

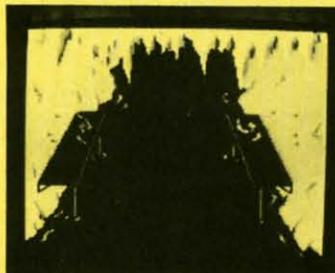
Disk No. 1 — Courses for Leader Board. Four different golf courses are on this disk of varying degrees of difficulty. List \$19.95. **Sale \$13.95.**

Disk Drive Speeder-Uppers

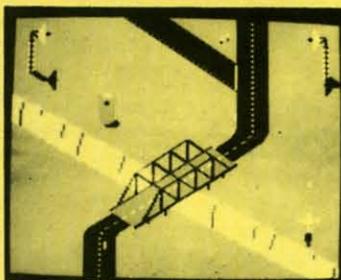


Mach 5 — Plug Mach 5 into the cartridge port and turn on the computer, the cartridge works automatically to load programs up to 5 times faster than normal. Loads 99% of all software, even copy protected games. Works with all popular printers. Will list directories without disturbing programs in memory. Commands such as LOAD, SAVE, OPEN etc. are executed with one keystroke. More features than most other "fast loaders". Does not disturb RAM. (Cart.) List \$34.95. **Sale \$19.95.**

Mach 128 — This "fast loader" will load programs up to 500% faster on the 1541 disk drive or the 1571 drive in 1541 mode, plus it has features that make it one of the best on the market. A full help menu, screen dump, 95% compatibility, 10 second formatting, plus much, much more. (Disk) List \$49.95. **Sale \$28.95.**



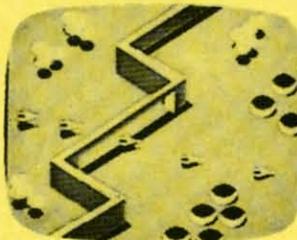
Beachhead II — Fantastic hi-res scrolling screens will lead you to new levels of excitement. Three scenarios, each with fantastic scrolling screens, add great realism to the game. First you maneuver your helicopter past tanks and artillery to the fortress wall. Then you must time your moves quickly as you go through the opening and closing gates. Scene 2 starts after you drop your paratroopers and make your way to the dictators machine gun emplacement. You must attack the dictator and rescue his hostages. Finally in Scene 3 you have the final confrontation plus you can be the rescuer or the dictator and play against an opponent or the computer. Fantastic two player Head to Head action. Highly recommended. (Disk) List \$49.95. **Sale \$22.95**



Beach Head — Multi Screen computer graphics at its finest. First you must maneuver your fleet through the mine laden channel while torpedoes are fired at you from all sides. Next you must engage the enemy planes with your anti-aircraft guns (best scenario graphics anywhere). Then you must sink the enemy fleet before they sink you. Next you maneuver to the beach head where your tanks must get through an obstacle course and finally fight the ultimate battle at Headquarters. All scenes in stunning 3-D graphics. List \$39.95. **Sale \$17.95.** (Disk or Tape.)



Raid over Moscow — The ultimate in multi screen computer graphics has arrived. (over six screens) The Soviets have launched an attack. First you must locate and destroy the ICBM missiles from your Stealth Bomber, then you must lead your squadron through the Soviet terrain to the Kremlin itself. Destroy the defenses, then destroy the defense center and finally the attack operations themselves. Fly planes, launch grenades, shoot bazookas. Super Fantastic Graphics, Sound, Animation. List \$39.95. **Sale \$22.95.** (Disk.)



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The World's Greatest Football Game — This one has it all — strategy, action, three views of the field. It's in a class all its own! Finally, a football game that not only puts you on the field, but also on the sidelines in the coach's shoes. Use the "Playbook" or design your own offensive and defensive plays. Then, grab the joystick and put your strategy to the test. You control key players to run a sweep, make a tackle, throw a pass and even kick a fieldgoal. All the action and all the strategy make this your favorite football game. (Disk) List \$39.95. Sale \$22.95.

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The New World's Greatest Baseball Game — One of the season's hottest offerings is this new enhanced baseball program. Fans can take over managing their favorite team, or create an All-Star team with players from the past or present. Two double sided disks are filled with teams, players and their stats. The graphics are improved and the team roster is the most complete that is currently available. A scoreboard will challenge your knowledge of baseball trivia. Two game modes allow you to play and manage or just manage. Fantastic. (Disk) List \$34.95. Sale \$18.95.

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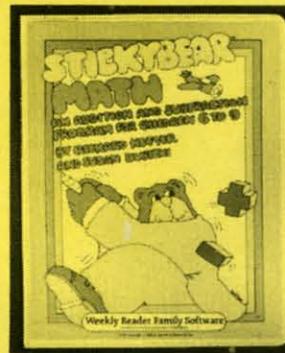
Stickybear Typing — Stickybear makes learning the keyboard both easy & fun for anyone. A 3 game format provides different levels so that as typing skills improve so does the level of difficulty. **Stickybear Keypress** is geared to the needs of the child or the beginner, the stress is on the keyboard. To increase typing speed and accuracy the fast-paced **Stickybear Thump** will provide a real challenge. **Stickybear Stories** allows further practice with real text for timed practice. Everything from jokes, stories and bright amusing graphics make this one of the most delightful typing programs ever, plus you can keep track of your progress and store on disk. (Disk) List \$29.95. **Sale \$14.95.**



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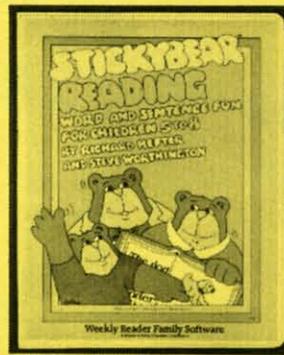
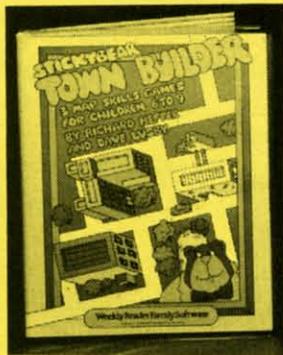
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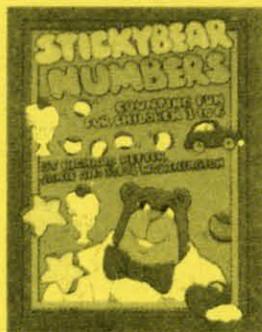
Stickybear Spellgrabber — 3 games in one: Picture Spell contains over 200 word/picture combinations. Word Spell is a scramble game, players recreate words shown on the screen. Bear Dunk involves guessing a word to save Stickybear from a dunking. (Disk) List \$29.95. **Sale \$14.95.**

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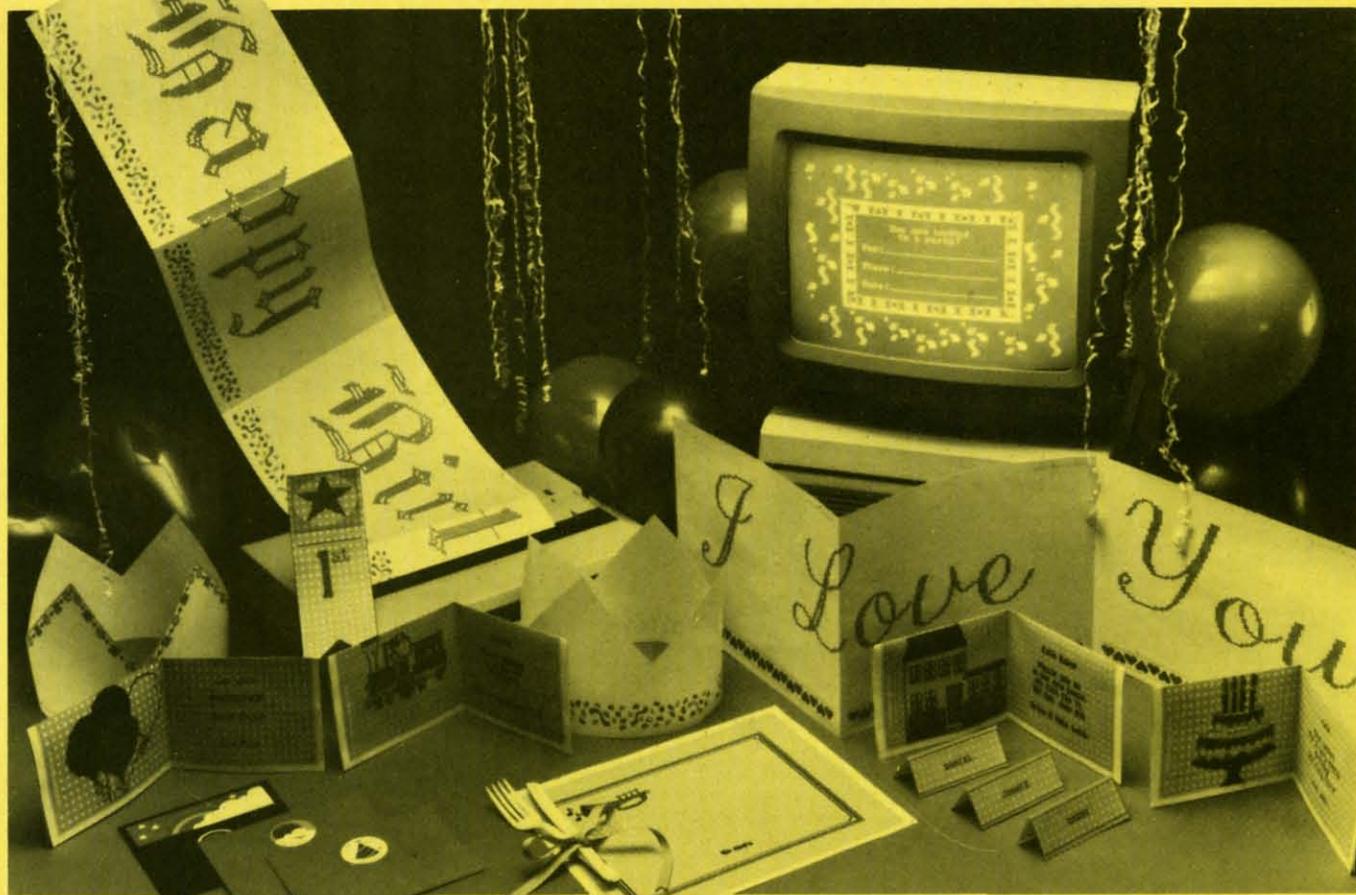
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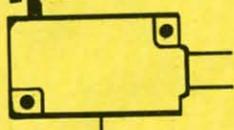
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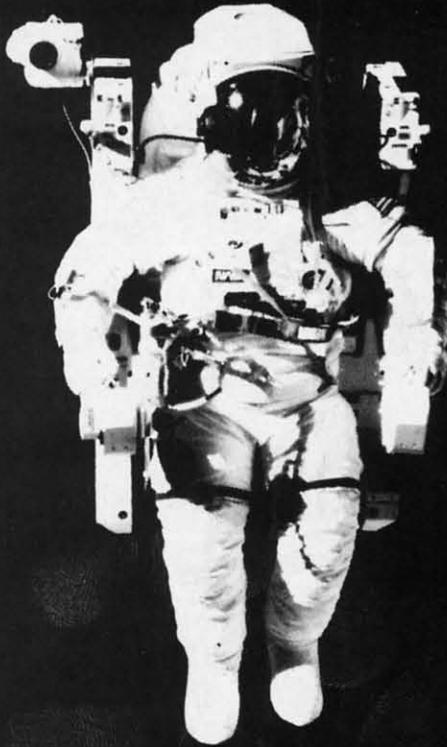
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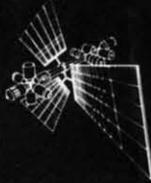
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ELCOTSAM

I just received GEOS in the mail and immediately consumed the reference manual. With preliminaries out of the way, I sat down to experience my new world. My fun soon turned to despair as the backup utility failed to copy onto a brand new disk. With a little testing, I determined a misaligned disk drive was the culprit. Oh brother. I considered ordering a disk alignment program through the mail, but that takes time and my new program would lie dormant. I was not about to invite tragedy by working with the original disk. But somewhere in the back of my mind, I remembered such a utility being published in a magazine. After a frantic search through all of my back issues with no luck, I finally dug up a magazine I had been entering a program from and had not yet checked. *Ahoy!* issue 26—Feb. '86—on page 83. *Yes!* That's where it was! For two hours I performed surgery with the tools and instructions I found there. The patient not only survived, but is doing great! And best of all, I got to dive head first into GEOS that night! So all I really wrote to say is THANK YOU!! for such a useful article.

—Thomas P. Shultz
Clarion, PA

I am not a subscriber to your magazine, but I do pick it up at the newsstand fairly regularly. It's reasonably well done and the price makes it stand out. Though in general I approve of what you do, I take offense at an ad which appeared in the June 1986 issue on page 55. It's for a C-64 program called *The Attractor*. This kind of sexist sleaze has no business in this magazine. Perhaps Bob Guccione would run it, but a mature computer magazine should not. The ad appears to be aimed at 14 year old boys and at lonely, desperate computer jocks. It is degrading to both women and computer professionals. Be it known that there is at least one computer professional who reads this magazine who is above the age of 14 and who has a perfectly healthy social life. I suspect that I'm not alone. It might be interesting to poll your readers as to age group and profession to see if such an ad really reaches its intended audience.

I think it might behoove your editorial staff to take a closer look at what is getting printed. I dislike the thought of anyone playing censor, but on the other hand, this kind of sleazeware gives the software industry a bad name. The "programmers" who write this kind of pseudo-psychological crap and the marketing people who foist it off on us don't deserve a second look, let alone a full page ad. *New Yorker* would likely not print an ad for those "How to get a girl" books and *Science Digest* would not run an ad for spanish fly, so why should you feel obligated to run this sort of ad? If you need to increase revenue, try raising your price by a dime or so. Surely quality is worth that.

—Gary R. Heffelfinger
Greenville, SC

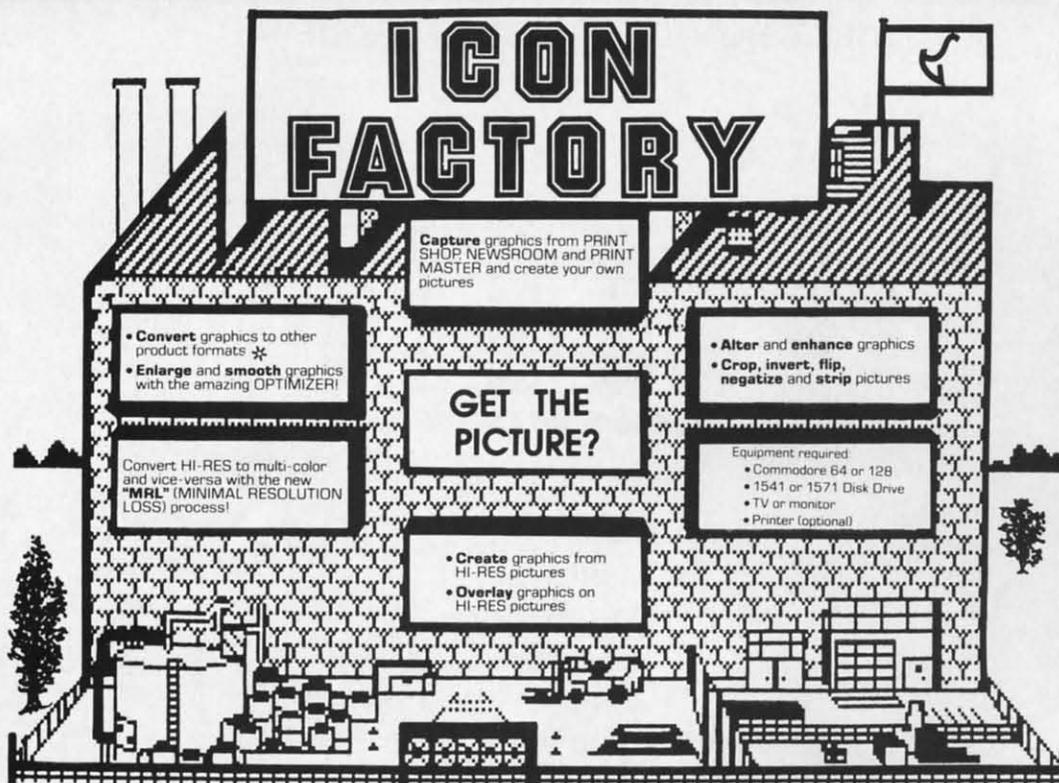


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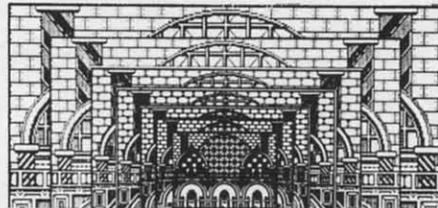
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M3B 1Z3**

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PROGRAM LISTINGS

Attention new *Ahoy!* readers! You must read the following information very carefully prior to typing in programs listed in *Ahoy!* Certain Commodore characters, commands, and strings of characters and commands will appear in a special format. Follow the instructions and listing guide on this page.

On the following pages you'll find several programs that you can enter on your Commodore computer. But before doing so, read this entire page carefully.

To insure clear reproductions, *Ahoy!*'s program listings are generated on a daisy wheel printer, incapable of printing the commands and graphic characters used in Commodore programs. These are therefore represented by various codes enclosed in brackets []. For example: the SHIFT CLR/HOME command is represented onscreen by a heart . The code we use in our listings is [CLEAR]. The chart below lists all such codes which you'll encounter in our listings, except for one other special case.

The other special case is the COMMODORE and SHIFT characters. On the front of most keys are two symbols. The symbol on the left is obtained by pressing that key while holding down the COMMODORE key; the symbol on the right, by pressing that key while holding down the SHIFT key. COMMODORE and SHIFT characters are represented in our listings by a lower-case "s" or "c" followed by the symbol of the key you must hit. COMMODORE J, for example, is represented by [c J],

and SHIFT J by [s J].

Additionally, any character that occurs more than two times in a row will be displayed by a coded listing. For example, [3 "[LEFT]"] would be 3 CuRSor left commands in a row, [5 "[s EP]"] would be 5 SHIFTEd English Pounds, and so on. Multiple blank spaces will be noted in similar fashion: e.g., 22 spaces as [22 " "].

Sometimes you'll find a program line that's too long for the computer to accept (C-64 lines are a maximum of 80 characters, or 2 screen lines long; VIC 20 lines, a maximum of 88 characters, or 4 screen lines). To enter these lines, refer to the *BASIC Command Abbreviations Appendix* in your User Manual.

On the next page you'll find our *Bug Repellent* programs for the C-128 and C-64. The version appropriate for your machine will help you proofread our programs after you type them. (Please note: the *Bug Repellent* line codes that follow each program line, in the whited-out area, should *not* be typed in. See the instructions preceding each program.)

Also on the following page you will find *Flankspeed*, our ML entry program, and instructions on its use. Call *Ahoy!* at 212-239-0855 with any problems.

When You See	It Means	You Type	You Will See	When You See	It Means	You Type	You Will See
[CLEAR]	Screen Clear	SHIFT CLR/HOME		[BLACK]	Black	CNTRL 1	
[HOME]	Home	CLR/HOME		[WHITE]	White	CNTRL 2	
[UP]	Cursor Up	SHIFT ↑ CRSR ↓		[RED]	Red	CNTRL 3	
[DOWN]	Cursor Down	↑ CRSR ↓		[CYAN]	Cyan	CNTRL 4	
[LEFT]	Cursor Left	SHIFT ← CRSR →		[PURPLE]	Purple	CNTRL 5	
[RIGHT]	Cursor Right	← CRSR →		[GREEN]	Green	CNTRL 6	
[SS]	Shifted Space	SHIFT Space		[BLUE]	Blue	CNTRL 7	
[INSERT]	Insert	SHIFT INST/DEL		[YELLOW]	Yellow	CNTRL 8	
[DEL]	Delete	INST/DEL		[F1]	Function 1	F1	
[RVSON]	Reverse On	CNTRL 9		[F2]	Function 2	SHIFT F1	
[RVSOFF]	Reverse Off	CNTRL 0		[F3]	Function 3	F3	
[UPARROW]	Up Arrow	↑		[F4]	Function 4	SHIFT F3	
[BACKARROW]	Back Arrow	←		[F5]	Function 5	F5	
[PI]	PI	π		[F6]	Function 6	SHIFT F5	
[EP]	English Pound	£		[F7]	Function 7	F7	
				[F8]	Function 8	SHIFT F7	

BUG REPELLENT By MICHAEL KLEINERT and DAVID BARRON

Bug Repellent is a checksum program used for proofreading BASIC listings typed in from *Ahoy!* magazine. For each program line you enter, *Bug Repellent* will produce a two-letter code that should match the code listed beside that line in the magazine.

Type in, save, and run the *Bug Repellent*. (If you have a C-64, type in the C-64 version. If you have a C-128, you will need to type in the C-64 version for use with C-64 programs, and the C-128 version for use with C-128 programs.) If you have typed in *Bug Repellent* properly, you will get the message BUG REPELLENT INSTALLED; otherwise you will get an error message. If you get an error message, double check the *Bug Repellent* program for typing mistakes. Type NEW and hit RETURN. Then type in and save, or load, the *Ahoy!* program you wish to check. Type in SYS 49152 for the C-64 version or SYS 3072 for the C-128 version and hit RETURN (this will begin execution of *Bug Repellent*). You will see the prompt SCREEN OR PRINTER? Hit S if you want the codes listed on the screen, or P if you want them listed on the printer. To pause the listing depress and hold the SHIFT key.

Compare the codes your machine generates to those listed to the right of the corresponding program lines. If you spot a difference, that line contains an error. Write down the numbers of the lines where the contradictions occur. LIST each line, locate the errors, and correct them.

COMMODORE 64 VERSION

```

100 FOR X = 49152 TO 49488:READY:S=S+Y      AB
110 IF Y<0 OR Y>255 THEN 130                EA
120 POKE X,Y:NEXT:GOTO140                   ID
130 PRINT"[CLEAR][DOWN]**ERROR**":PRINT"[DOWN]
PLEASE CHECK LINE"PEEK(64)*256+PEEK(63):END ID
140 IF S<>44677 THEN PRINT"[CLEAR][DOWN]**ERR
OR**":PRINT"[DOWN]PLEASE CHECK DATA LINES 170
-500":END                                     HJ
150 PRINT"[CLEAR]":POKE53280,0:POKE53281,6:PO
KE646,1                                       NP
160 PRINT"[RVSON][6" "]C-64 BUG REPELLENT INS
TALLED[6" "]"                               LF
170 DATA32,161,192,165,43,133,251,165,44,133 DL
180 DATA252,160,0,132,254,32,37,193,234,177 DB
190 DATA251,208,3,76,138,192,230,251,208,2   OF
200 DATA230,252,76,43,192,76,73,78,69,32    KN
210 DATA35,32,0,169,35,160,192,32,30,171    CA
220 DATA160,0,177,251,170,230,251,208,2,230 CE
230 DATA252,177,251,32,205,189,169,58,32,210 JE
240 DATA255,169,0,133,253,230,254,32,37,193 CL
250 DATA234,165,253,160,0,76,13,193,133,253 NB
260 DATA177,251,208,237,165,253,41,240,74,74 MB
270 DATA74,74,24,105,65,32,210,255,165,253 EP
280 DATA 41,15,24,105,65,32,210,255,169,13  GH
290 DATA32,220,192,230,63,208,2,230,64,230 AN
300 DATA251,208,2,230,252,76,11,192,169,153 NG
310 DATA160,192,32,30,171,166,63,165,64,76  BF
320 DATA231,192,96,76,73,78,69,83,58,32    EP
330 DATA0,169,247,160,192,32,30,171,169,3   PJ
340 DATA133,254,32,228,255,201,83,240,6,201 FK
350 DATA80,208,245,230,254,32,210,255,169,4 FL
360 DATA166,254,160,255,32,186,255,169,0,133 CL
370 DATA63,133,64,133,2,32,189,255,32,192   GC
380 DATA255,166,254,32,201,255,76,73,193,96 NN
390 DATA32,210,255,173,141,2,41,1,208,249  NH
400 DATA96,32,205,189,169,13,32,210,255,32 IM
410 DATA204,255,169,4,76,195,255,147,83,67  KC
420 DATA82,69,69,78,32,79,82,32,80,82     DC
430 DATA 73,78,84,69,82,32,63,32,0,76     ML
440 DATA44,193,234,177,251,201,32,240,6,138 GN
450 DATA113,251,69,254,170,138,76,88,192,0  JK
460 DATA0,0,0,230,251,208,2,230,252,96    NA
470 DATA170,177,251,201,34,208,6,165,2,73  DM
480 DATA255,133,2,165,2,208,218,177,251,201 JA
490 DATA32,208,212,198,254,76,29,193,0,169 FM
500 DATA13,76,210,255,0,0,0              PA

```

COMMODORE 128 VERSION

```

100 FAST:FOR X = 3072 TO 3520:READ Y:POKE X,Y
:S=S+Y:TRAP110:NEXT:SLOW                    IH
110 SLOW:IF S<>49057 THEN PRINT"[CLEAR][DOWN]
**ERROR**":PRINT"[DOWN]PLEASE CHECK DATA LINE
S 140-390":END                               JA

```

```

120 PRINT"[CLEAR][DOWN] C-128 BUG REPELLENT
INSTALLED"                                  II
130 PRINT"[4" "]TYPE SYS 3072 TO ACTIVATE"   IN
140 DATA 32,161,12,165,45,133,251,165,46,133,
252,160,0,132,254,32,37                    OF
150 DATA 13,234,177,251,208,3,76,138,12,230,2
51,208,2,230,252,76,43                      NC
160 DATA 12,76,73,78,69,32,35,32,0,169,35,160
,12,32,80,13,160,0,177                     OL
170 DATA 251,170,230,251,208,2,230,252,177,25
1,32,89,13,169,58,32,98                     EF
180 DATA 13,169,0,133,253,230,254,32,37,13,23
4,165,253,160,0,76,13                       JO
190 DATA 13,133,253,177,251,208,237,165,253,4
1,240,74,74,74,74,24                         LC
200 DATA 105,65,32,98,13,165,253,41,15,24,105
,65,32,98,13,169,13,32                     DE
210 DATA 220,12,230,65,208,2,230,66,230,251,2
08,2,230,252,76,11,12                       GM
220 DATA 169,153,160,12,32,80,13,166,65,165,6
6,76,231,12,96,76,73,78                     CP
230 DATA 69,83,58,32,0,169,247,160,12,32,80,1
3,169,3,133,254,32,107                       HC
240 DATA 13,201,83,240,6,201,80,208,245,230,2
54,32,98,13,169,4,166                       GK
250 DATA 254,160,255,32,116,13,169,0,133,65,1
33,66,133,250,32,125,13                     LB
260 DATA 32,134,13,166,254,32,143,13,76,73,13
,96,32,98,13,165,211                         JF
270 DATA 234,41,1,208,249,96,32,89,13,169,13,
32,98,13,32,152,13,169,4                     GD
280 DATA 76,161,13,147,83,67,82,69,69,78,32,7
9,82,32,80,82,73,78,84,69                   PL
290 DATA 82,32,63,32,0,76,44,13,234,177,251,2
01,32,240,6,138,113,251,69                   OK
300 DATA 254,170,138,76,88,12,0,0,0,0,230,251
,208,2,230,252,96,170,177                   FJ
310 DATA 251,201,34,208,6,165,250,73,255,133,
250,165,250,208,218,177                     GA
320 DATA 251,201,32,208,212,198,254,76,29,13,
0,169,13,76,98,13,0,0,32                   FI
330 DATA 170,13,32,226,85,76,180,13,32,170,13
,32,50,142,76,180,13,32                     OF
340 DATA 170,13,32,210,255,76,180,13,32,170,1
3,32,228,255,76,180,13,32                   AK
350 DATA 170,13,32,186,255,76,180,13,32,170,1
3,32,189,255                                 BP
360 DATA 76,180,13,32,170,13,32,192,255,76,18
0,13,32,170,13                               FP
370 DATA 32,201,255,76,180,13,32,170,13,32,20
4,255,76,180,13,32,170                       ID
380 DATA 13,32,195,255,76,180,13,133,67,169,0
,141,0,255,165,67,96                         BJ
390 DATA 133,67,169,0,141,1,255,165,67,96,0,0
,0                                             IF

```

FLANKSPEED FOR THE C-64 By GORDON F. WHEAT

Flankspeed will allow you to enter machine language *Ahoy!* programs without any mistakes. Once you have typed the program in, save it for future use. While entering an ML program with *Flankspeed* there is no need to enter spaces or hit the carriage return. This is all done automatically. If you make an error in a line a bell will ring and you will be asked to enter it again. To LOAD in a program Saved with *Flankspeed* use LOAD "name",1,1 for tape, or LOAD "name",8,1 for disk. The function keys may be used after the starting and ending addresses have been entered.

f1 - SAVES what you have entered so far.

f3 - LOADs in a program worked on previously.

f5 - To continue on a line you stopped on after LOADing in the previous saved work.

f7 - Scans through the program to locate a particular line, or to find out where you stopped the last time you entered the program.

f7 temporarily freezes the output as well.

```

•100 POKE53280,12:POKE53281,11
•105 PRINT"[CLEAR][c 8][RVSON][15" "]FLANKSPEED[15" "];
•110 PRINT"[RVSON][5" "]MISTAKEPROOF ML ENTRY PROGRAM[6" "
]"
•115 PRINT"[RVSON][9" "]CREATED BY G. F. WHEAT[9" "]]
•120 PRINT"[RVSON][3" "]COPR. 1984, ION INTERNATIONAL INC.
[3" "]]
•125 FORA=54272TO54296:POKEA,0:NEXT
•130 POKE54272,4:POKE54273,48:POKE54277,0:POKE54278,249:PO
KE54296,15
•135 FORA=680TO699:READB:POKEA,B:NEXT
•140 DATA169,251,166,253,164,254,32,216,255,96
•145 DATA169,0,166,251,164,252,32,213,255,96
•150 B$="STARTING ADDRESS IN HEX":GOSUB430:AD=B:SR=B
•155 GOSUB480:IFB=0THEN150
•160 POKE251,T(4)+T(3)*16:POKE252,T(2)+T(1)*16
•165 B$="ENDING ADDRESS IN HEX":GOSUB430:EN=B
•170 GOSUB470:IFB=0THEN150
•175 POKE254,T(2)+T(1)*16:B=T(4)+1+T(3)*16
•180 IFB>255THENB=B-255:POKE254,PEEK(254)+1
•185 POKE253,B:PRINT
•190 REM GET HEX LINE
•195 GOSUB495:PRINT": [c P][LEFT]";:FORA=0TO8
•200 FORB=0TO1:GOTO250
•205 NEXTB
•210 A%(A)=T(1)+T(0)*16:IFAD+A-1=ENTHEN340
•215 PRINT" [c P][LEFT]";
•220 NEXTA:T=AD-(INT(AD/256)*256):PRINT" "
•225 FORA=0TO7:T=T+A%(A):IFT>255THENT=T-255
•230 NEXT
•235 IFA%(8)<>TTHENGOSUB375:GOTO195
•240 FORA=0TO7:POKEAD+A,A%(A):NEXT:AD=AD+8:GOTO195
•245 REM GET HEX INPUT
•250 GETA$:IFA$=""THEN250
•255 IFA$=CHR$(20)THEN305
•260 IFA$=CHR$(133)THEN535
•265 IFA$=CHR$(134)THEN560
•270 IFA$=CHR$(135)THENPRINT" ":GOTO620
•275 IFA$=CHR$(136)THENPRINT" ":GOTO635
•280 IFA$>"@ANDAS<"G"THENT(B)=ASC(A$)-55:GOTO295
•285 IFA$>"/ANDAS<"":THENT(B)=ASC(A$)-48:GOTO295
•290 GOSUB415:GOTO250
•295 PRINTA$"[c P][LEFT]";
•300 GOTO205
•305 IFA>0THEN320
•310 A=-1:IFB=1THEN330
•315 GOTO220
•320 IFB=0THENPRINTCHR$(20);CHR$(20);:A=A-1
•325 A=A-1
•330 PRINTCHR$(20);:GOTO220
•335 REM LAST LINE
•340 PRINT" ":T=AD-(INT(AD/256)*256)
•345 FORB=0TOA-1:T=T+A%(B):IFT>255THENT=T-255
•350 NEXT
•355 IFA%(A)<>TTHENGOSUB375:GOTO195
•360 FORB=0TOA-1:POKEAD+B,A%(B):NEXT
•365 PRINT:PRINT"YOU ARE FINISHED!":GOTO535
•370 REM BELL AND ERROR MESSAGES
•375 PRINT:PRINT"LINE ENTERED INCORRECTLY":PRINT:GOTO415
•380 PRINT:PRINT"INPUT A 4 DIGIT HEX VALUE!":GOTO415
•385 PRINT:PRINT"ENDING IS LESS THAN STARTING!":B=0:GOTO41
LL 5
ED •390 PRINT:PRINT"ADDRESS NOT WITHIN SPECIFIED RANGE!":B=0:
GOTO415
MC •395 PRINT:PRINT"NOT ZERO PAGE OR ROM!":B=0:GOTO415
DM •400 PRINT"?ERROR IN SAVE":GOTO415
•405 PRINT"?ERROR IN LOAD":GOTO415
DH •410 PRINT:PRINT:PRINT"END OF ML AREA":PRINT
IM •415 POKE54276,17:POKE54276,16:RETURN
•420 OPEN15,8,15:INPUT#15,A,A$:CLOSE15:PRINTA$:RETURN
NH •425 REM GET FOUR DIGIT HEX
KO •430 PRINT:PRINTB$;:INPUTT$
HJ •435 IFLEN(T$)<>4THENGOSUB380:GOTO430
JB •440 FORA=1TO4:A$=MID$(T$,A,1):GOSUB450:IFT(A)=16THENGOSUB
KA 380:GOTO430
GN •445 NEXT:B=(T(1)*4096)+(T(2)*256)+(T(3)*16)+T(4):RETURN
KE •450 IFA$>"@ANDAS<"G"THENT(A)=ASC(A$)-55:RETURN
LO •455 IFA$>"/ANDAS<"":THENT(A)=ASC(A$)-48:RETURN
EE •460 T(A)=16:RETURN
MN •465 REM ADDRESS CHECK
GE •470 IFAD>ENTHEN385
HN •475 IFB<SRORB>ENTHEN390
IL •480 IFB<256OR(B>4096)AND(B<49152)ORB>53247THEN395
NH •485 RETURN
MP •490 REM ADDRESS TO HEX
ME •495 AC=AD:A=4096:GOSUB520
LE •500 A=256:GOSUB520
IK •505 A=16:GOSUB520
PD •510 A=1:GOSUB520
LK •515 RETURN
IA •520 T=INT(AC/A):IFT>9THENA$=CHR$(T+55):GOTO530
LE •525 A$=CHR$(T+48)
BI •530 PRINTA$;:AC=AC-A*T:RETURN
AB •535 A$="**SAVE**":GOSUB585
HK •540 OPEN1,T,1,A$:SYS680:CLOSE1
HF •545 IFST=0THENEND
KH •550 GOSUB400:IFT=8THENGOSUB420
JM •555 GOTO535
EG •560 A$="**LOAD**":GOSUB585
AB •565 OPEN1,T,0,A$:SYS690:CLOSE1
DL •570 IFST=64THEN195
MD •575 GOSUB405:IFT=8THENGOSUB420
JJ •580 GOTO560
OA •585 PRINT" ":PRINTTAB(14)A$
CF •590 PRINT:A$="":INPUT"FILENAME";A$
PG •595 IFA$=""THEN590
OI •600 PRINT:PRINT"TAPE OR DISK?":PRINT
BM •605 GETB$:T=1:IFB$="D"THENT=8:A$="@0:"+A$:RETURN
HG •610 IFB$<>"T"THEN605
BE •615 RETURN
LK •620 B$="CONTINUE FROM ADDRESS":GOSUB430:AD=B
AD •625 GOSUB475:IFB=0THEN620
GJ •630 PRINT:GOTO195
PL •635 B$="BEGIN SCAN AT ADDRESS":GOSUB430:AD=B
IA •640 GOSUB475:IFB=0THEN635
NF •645 PRINT:GOTO670
HN •650 FORB=0TO7:AC=PEEK(AD+B):GOSUB505:IFAD+B=ENTHENAD=SR:G
JA OSUB410:GOTO195
FL •655 PRINT" ";:NEXTB
DA •660 PRINT:AD=AD+8
DF •665 GETB$:IFB$=CHR$(136)THEN195
•670 GOSUB495:PRINT" ";:GOTO650

```

THE SHADOW KNOWS

FROM PAGE 27

Assembler required for entry! See introductory article.

SPRITE 1

```

1 *
2 * SPRITE1
3 *
4      ORG      $1300
5 *
6 COLOR EQU     $E0
7 *
8 TABLEN EQU   $800
9 MAPLEN EQU   1000
10 SCRLLEN EQU  8000
11 SPOADR EQU   $4E00
12 COLMAP EQU   $5C00
13 NEWADR EQU   $4000
14 *
15 SPRPTR EQU   $5FF8
16 SPENA EQU   $D015
17 SPOCOL EQU   $D027
18 SPOX EQU    $11D6
19 SPOY EQU    $11D7
20 MSIGX EQU   $11E6
21 YXPAND EQU   $D017
22 XXPAND EQU   $D01D
23 *
24 INDFET EQU   $FF74
25 *
26 HMAX EQU    320
27 VMID EQU   100-8
28 *
29 R6510 EQU   $0001
30 BASE EQU   $6000
31 CHRBAS EQU  $D000
32 SCROLY EQU  $D011
33 SVMCSB EQU  $A2D
34 BORDER EQU  $D020
35 CIACRE EQU  $DC0E
36 CI2PRA EQU  $DD00
37 CIADIR EQU  $DD02
38 *
39 TMPA EQU    $C8
40 TMPB EQU   TMPA+2
41 TPTR EQU    TMPA
42 *
43 MSRC EQU    $FA
44 MDST EQU   MSRC+2
45 BPTR EQU   MDST+2
46 *
47 TABSIZ EQU  $0C00
48 *
49 HPSN EQU   TABSIZ+2
50 VPSN EQU   HPSN+2
51 CHAR EQU   VPSN+1

```

```

52 ROW EQU     CHAR+1
53 LINE EQU    ROW+1
54 BYTE EQU    LINE+1
55 BITT EQU    BYTE+2
56 *
57 MPRL EQU    BITT+1
58 MPRH EQU    MPRL+1
59 MPDL EQU    MPRH+1
60 MPDH EQU    MPDL+1
61 PRODL EQU   MPDH+1
62 PRODH EQU   PRODL+1
63 FILVAL EQU  PRODH+1
64 LENPTR EQU  FILVAL+1
65 CHCODE EQU  LENPTR+2
66 HPTR EQU    CHCODE+2
67 VPTR EQU    HPTR+2
68 ONEBYT EQU  VPTR+1
69 COUNT EQU   ONEBYT+2
70 LTTR EQU    COUNT+1
71 *
72      JMP     START
73 *
74 TEXT DFB    9,32,32,13
75      DFB    25,32,3,15
76      DFB    13,13,15,4
77      DFB    15,18,5,32
78      DFB    49,50,56,0
79 *
80 * BLOCK FILL ROUTINE
81 *
82 BLKFIL LDA   FILVAL
83      LDX   TABSIZ+1
84      BEQ   PARTPG
85      LDY   #0
86 FULLPG STA   (TPTR),Y
87      INY
88      BNE   FULLPG
89      INC   TPTR+1
90      DEX
91      BNE   FULLPG
92 PARTPG LDX   TABSIZ
93      BEQ   FINI
94      LDY   #0
95 PARTLP STA   (TPTR),Y
96      INY
97      DEX
98      BNE   PARTLP
99 FINI  RTS
100 *
101 * MULTIPLICATION ROUTINE
102 *
103 MULT16 LDA  #0
104      STA  PRODL
105      STA  PRODH
106      LDX  #17
107      CLC
108 MULT  ROR  PRODH
109      ROR  PRODL

```

```

110      ROR  MPRH
111      ROR  MPRL
112      BCC  CTDOWN
113      CLC
114      LDA  MPDL
115      ADC  PRODL
116      STA  PRODL
117      LDA  MPDH
118      ADC  PRODH
119      STA  PRODH
120 CTDOWN DEX
121      BNE  MULT
122      RTS
123 *
124 * PLOT ROUTINE
125 *
126 * ROW=VPSN/8
127 *
128 PLOT  LDA  VPSN
129      LSR  A
130      LSR  A
131      LSR  A
132      STA  ROW
133 *
134 * CHAR=HPSN/8
135 *
136      LDA  HPSN
137      STA  TMPA
138      LDA  HPSN+1
139      STA  TMPA+1
140      LDX  #3
141 DLOOP LSR  TMPA+1
142      ROR  TMPA
143      DEX
144      BNE  DLOOP
145      LDA  TMPA
146      STA  CHAR
147 *
148 * LINE=VPSN AND 7
149 *
150      LDA  VPSN
151      AND  #7
152      STA  LINE
153 *
154 * BITT=7-(HPSN AND 7)
155 *
156      LDA  HPSN
157      AND  #7
158      STA  BITT
159      SEC
160      LDA  #7
161      SBC  BITT
162      STA  BITT
163 *
164 * BYTE=BASE+ROW*HMAX
165 *      +8*CHAR+LINE
166 * MULTIPLY ROW * HMAX
167 *

```

168	LDA	ROW	226	STA	TMPB+1	284	STA	ONEBYT
169	STA	MPRL	227	*		285	*	
170	LDA	#0	228	*	BYTE=PEEK(BYTE)OR2^BIT	286	*	THE INSIDE LOOP:
171	STA	MPRH	229	*		287	*	
172	LDA	#<HMAX	230	LDX	BITT	288	*	(Y IS ZERO AT START)
173	STA	MPDL	231	INX		289	*	
174	LDA	#>HMAX	232	LDA	#0	290	RSHIFT	LDA ONEBYT
175	STA	MPDH	233	SEC		291	ASL	A
176	JSR	MULT16	234	SQUARE	ROL	292	STA	ONEBYT
177	LDA	MPRL	235	DEX		293	BCS	SHOW
178	STA	TMPA	236	BNE	SQUARE	294	*	
179	LDA	MPRL+1	237	LDY	#0	295	INC	HPSN
180	STA	TMPA+1	238	ORA	(TMPB),Y	296	BNE	ITSOK
181	*		239	STA	(TMPB),Y	297	INC	HPSN+1
182	*	ADD PRODUCT TO BASE	240	RTS		298	ITSOK	JMP NOSHOW
183	*		241	*		299	*	
184	CLC		242	*	CALCULATE CHCODE	300	*	DISPLAY BIT
185	LDA	#<BASE	243	*	ADDRESS	301	*	
186	ADC	TMPA	244	GETADR	LDA #0	302	*	SAVE X AND Y REGISTERS
187	STA	TMPA	245	STA	CHCODE+1	303	*	
188	LDA	#>BASE	246	LDA	CHCODE	304	SHOW	TXA
189	ADC	TMPA+1	247	CLC		305		PHA
190	STA	TMPA+1	248	ASL	A	306		TYA
191	*		249	ROL	CHCODE+1	307		PHA
192	*	MULTIPLY 8 * CHAR	250	ASL	A	308	*	
193	*		251	ROL	CHCODE+1	309		JSR PLOT
194	LDA	#8	252	ASL	A	310	*	
195	STA	MPRL	253	ROL	CHCODE+1	311	*	NOW DO IT AGAIN
196	LDA	#0	254	STA	CHCODE	312	*	
197	STA	MPRH	255	*		313	INC	HPSN
198	LDA	CHAR	256	CLC		314	BNE	NOINC
199	STA	MPDL	257	LDA	CHCODE	315	INC	HPSN+1
200	LDA	#0	258	ADC	#<NEWADR	316	*	
201	STA	MPDH	259	STA	BPTR	317	NOINC	JSR PLOT
202	JSR	MULT16	260	LDA	CHCODE+1	318	*	
203	LDA	MPRL	261	ADC	#>NEWADR	319	*	RETRIEVE X, Y
204	STA	TMPB	262	STA	BPTR+1	320	*	REGISTERS
205	LDA	MPRH	263	RTS		321		PLA
206	STA	TMPB+1	264	*		322		TAY
207	*		265	*	DRAW A CHARACTER	323		PLA
208	*	ADD LINE	266	*		324		TAX
209	*		267	DRAWCH	LDA LTR	325	*	
210	CLC		268	STA	CHCODE	326	NOSHOW	INC HPSN
211	LDA	TMPB	269	JSR	GETADR	327		BNE LEAP
212	ADC	LINE	270	*		328		INC HPSN+1
213	STA	TMPB	271	*	A NESTED LOOP:	329	*	
214	LDA	TMPB+1	272	*		330	LEAP	INY
215	ADC	#0	273	*	(X IS THE OUTSIDE	331		CPY #8
216	STA	TMPB+1	274	*	LOOP)	332		BCC RSHIFT
217	*		275		LDX #8	333	*	
218	*	TMPA + TMPB = BYTE	276	*		334		INC VPSN
219	*		277	*	DRAW 2 VERT LINES	335	*	
220	CLC		278	*		336		LDA HPTR
221	LDA	TMPA	279	SETLIN	LDA #2	337		STA HPSN
222	ADC	TMPB	280		STA COUNT	338		LDA HPTR+1
223	STA	TMPB	281	*		339		STA HPSN+1
224	LDA	TMPA+1	282	DRAWLN	LDY #0	340	*	
225	ADC	TMPB+1	283		LDA (BPTR),Y	341	*	2 VERT LINES DONE YET?

```

342 *
343     DEC     COUNT
344     BNE     DRAWLN
345 *
346     INC     BPTR
347     BNE     OKMSB
348     INC     BPTR+1
349 OKMSB     DEX
350     BNE     SETLIN
351     RTS
352 *
353 * COPY CHR SET INTO RAM
354 *
355 * PUT DATA IN NEW SPOT
356 *
357 COPYCHRS LDA #<CHRBAS
358     STA     MSRC
359     LDA     #>CHRBAS
360     STA     MSRC+1
361 *
362     LDA     #<NEWADR
363     STA     MDST
364     LDA     #>NEWADR
365     STA     MDST+1
366 *
367     LDA     #<TABLEN
368     STA     LENPTR
369     LDA     #>TABLEN
370     STA     LENPTR+1
371 *
372     LDY     #0
373     LDX     LENPTR+1
374     BEQ     MVPART
375 MVPAGE     JSR     GETDATA
376     INY
377     BNE     MVPAGE
378     INC     MSRC+1
379     INC     MDST+1
380     DEX
381     BNE     MVPAGE
382 MVPART     LDX     LENPTR
383     BEQ     MVEXIT
384 MVLAST     JSR     GETDATA
385     INY
386     DEX
387     BNE     MVLAST
388 MVEXIT     RTS
389 *
390 * USE INDFET ROUTINE
391 *
392 GETDATA     PHA
393     TXA
394     PHA
395     LDA     #MSRC
396     LDX     #14
397     JSR     INDFET
398     STA     (MDST),Y
399     PLA
400     TAX
401     PLA
402     RTS
403 *
404 *
405 * MAIN ROUTINE
406 *
407 START     JSR     COPYCHRS
408 *
409     LDA     #$20
410     STA     $D8
411 *
412 * USE VIDEO BANK 2
413 *
414     LDA     #0
415     STA     $FFF0
416     LDA     CI2PRA
417     AND     #$FC
418     ORA     #$02
419     STA     CI2PRA
420     STA     $FF01
421 *
422 * SCREEN MAP AT $6000,
423 * COLOR MAP AT $5C00
424 *
425     LDA     #$78
426     STA     SVMCSB
427 *
428 * CLEAR BIT MAP
429 *
430     LDA     #0
431     STA     FILVAL
432     LDA     #<BASE
433     STA     TPTR
434     LDA     #>BASE
435     STA     TPTR+1
436     LDA     #<SCRLEN
437     STA     TABSIZ
438     LDA     #>SCRLEN
439     STA     TABSIZ+1
440     JSR     BLKFIL
441 *
442 * SET COLORS
443 *
444     LDA     #COLOR
445     STA     FILVAL
446     LDA     #<COLMAP
447     STA     TPTR
448     LDA     #>COLMAP
449     STA     TPTR+1
450     LDA     #<MAPLEN
451     STA     TABSIZ
452     LDA     #>MAPLEN
453     STA     TABSIZ+1
454     JSR     BLKFIL
455     LDA     #13
456     STA     BORDER
457 *
458 * POSITION MESSAGE ON
459 * SCREEN
460     LDA     #8
461     STA     HPSN
462     STA     HPTR
463     LDA     #0
464     STA     HPSN+1
465     STA     HPTR+1
466     LDA     #VMID
467     STA     VPSN
468     STA     VPTR
469 *
470 * PRINT LARGE TYPE
471 *
472     LDX     #0
473 DISP     LDA     TEXT,X
474     CMP     #0
475     BEQ     DONE
476     STA     LTTR
477     TXA
478     PHA
479     JSR     DRAWCH
480     PLA
481     TAX
482 *
483 * ADVANCE CURSOR
484 *
485     CLC
486     LDA     HPTR
487     ADC     #16
488     STA     HPTR
489     STA     HPSN
490     LDA     HPTR+1
491     ADC     #0
492     STA     HPTR+1
493     STA     HPSN+1
494     LDA     VPTR
495     STA     VPSN
496 *
497 * PRINT NEXT LETTER
498 *
499     INX
500     JMP     DISP
501 *
502 DONE     JMP     DONE

```

PROGRAMS NEEDED!

Send yours on disk, accompanied by a program printout, documentation, and a stamped, self-addressed envelope to:

Ahoy! Program Submissions
Ion International Inc.

45 West 34th Street—Suite 407
New York, NY 10001

TENPINS FROM PAGE 77

Starting address in hex: C000

Ending address in hex: C71E

SYS to start: 49152

Flankspeed required for entry! See page 121.

C000: A9 FF A0 00 99 40 3E C8 2B
 C008: C0 2A 90 F8 A9 00 99 40 FF
 C010: 3E C8 C0 40 90 F8 A8 B9 04
 C018: DF C5 99 80 3E C8 D0 F7 A7
 C020: B9 DF C6 99 80 3F C8 C0 63
 C028: 40 90 F5 A9 00 99 80 3F F1
 C030: C8 10 FA A9 78 8D EF 3F E2
 C038: 8D FB 3F A9 FC 8D F2 3F 67
 C040: 8D F5 3F 8D F8 3F A0 18 81
 C048: B9 D0 C4 99 00 D4 88 10 9E
 C050: F7 8C F9 07 C8 8C 20 D0 1C
 C058: 8C 25 D0 8C 28 D0 C8 8C B5
 C060: 1C D0 A0 0A 8C 26 D0 C8 44
 C068: 8C 29 D0 A9 04 8D 1B D0 16
 C070: 8D 1D D0 8D 04 D0 A9 F9 F1
 C078: 8D FA 07 78 A9 7F 8D 0D 44
 C080: DC A9 01 8D 1A D0 8D 12 20
 C088: D0 A9 1B 8D 11 D0 A9 66 9D
 C090: 8D 14 03 A9 C4 8D 15 03 49
 C098: 58 A9 00 8D 15 D0 A9 75 2D
 C0A0: A0 C5 20 1E AB A9 B7 20 72
 C0A8: 3D C4 A0 01 84 05 84 FB 56
 C0B0: A2 04 C8 18 20 F0 FF A9 F2
 C0B8: 20 20 D2 FF 20 D2 FF A6 65
 C0C0: FB A9 00 20 CD BD E6 FB F4
 C0C8: A5 FB C9 0B 90 E9 A9 6D D0
 C0D0: A0 C5 20 1E AB A2 08 8A 56
 C0D8: 29 01 A8 B9 BC C4 20 D2 D9
 C0E0: FF 20 D2 FF A0 0C 20 D2 73
 C0E8: FF 48 BD BE C4 20 D2 FF 65
 C0F0: 68 20 D2 FF 88 D0 EF 20 B5
 C0F8: D2 FF BD C7 C4 20 D2 FF 09
 C100: CA 10 D4 A9 C4 20 3D C4 40
 C108: A9 08 8D 86 02 A9 0D 20 A6
 C110: D2 FF A9 B7 20 3D C4 A2 09
 C118: 17 A0 00 18 20 F0 FF A9 A2
 C120: C4 20 3D C4 A2 13 A0 0D 6A
 C128: 18 20 F0 FF A9 3D A0 C5 9E
 C130: 20 1E AB A9 00 85 C6 A5 B5
 C138: A2 29 10 0A 0A 0A 09 20 5B
 C140: 8D 13 07 20 E4 FF C9 31 E7
 C148: 90 ED C9 35 B0 E9 20 D2 53
 C150: FF 29 0F 8D A3 C4 A2 00 21
 C158: 20 79 C3 A2 13 20 FF E9 75
 C160: A9 07 8D 15 D0 A9 00 85 B3
 C168: 04 A4 04 B9 A7 C4 8D 27 EF
 C170: D0 B9 AC C4 8D 05 D0 BE 8E
 C178: B8 C4 A5 05 0A 18 65 05 2D
 C180: A8 C8 18 20 F0 FF 20 3F 7A
 C188: C2 A0 00 20 24 C4 20 D2 E7

C190: FF C9 D6 D0 05 A9 2D 4C 2A
 C198: A2 C1 20 52 C2 A0 01 20 F3
 C1A0: 24 C4 20 D2 FF 20 82 C3 E2
 C1A8: A2 02 A0 1E B1 02 C9 2D B6
 C1B0: F0 05 CA C9 4E D0 5C 8E 45
 C1B8: A4 C4 8A 09 30 8D 5D C5 96
 C1C0: BD 6A C5 8D 69 C5 A9 5D 72
 C1C8: A0 C5 20 46 C4 A9 5D A0 02
 C1D0: C5 20 46 C4 A4 04 BE B8 E1
 C1D8: C4 A0 22 18 20 F0 FF 20 A9
 C1E0: 3F C2 A0 00 20 24 C4 20 AC
 C1E8: D2 FF C9 D6 D0 12 A9 2D 16
 C1F0: 20 D2 FF A9 1D 20 D2 FF 9D
 C1F8: CE A4 C4 D0 E2 4C 10 C2 04
 C200: CE A4 C4 F0 0B 20 52 C2 69
 C208: A0 01 20 24 C4 20 D2 FF A5
 C210: 20 82 C3 E6 04 A5 04 CD D8
 C218: A3 C4 B0 03 4C 69 C1 E6 92
 C220: 05 A5 05 C9 0B B0 03 4C A4
 C228: 65 C1 A9 00 85 C6 A9 4F 3E
 C230: A0 C5 20 46 C4 20 E4 FF C6
 C238: C9 00 F0 F2 4C 99 C0 A0 2D
 C240: 09 BE E9 C4 B9 F3 C4 9D C6
 C248: F6 06 A9 01 9D F6 DA 88 E7
 C250: 10 EF A9 D6 8D A2 C4 A9 6F
 C258: 00 8D 10 D0 8D 03 D0 85 AD
 C260: FB A9 1B 8D 00 D0 A9 FE 28
 C268: 8D F8 07 AD 00 DC 29 03 AC
 C270: A8 18 B9 9B C4 6D A2 C4 20
 C278: C9 A7 90 07 C9 D7 B0 03 D6
 C280: 8D A2 C4 A2 0A 20 79 C3 7F
 C288: AD 00 DC 29 10 D0 DC A0 9A
 C290: 03 A2 3A 20 79 C3 CE F8 95
 C298: 07 EE 00 D0 88 10 F2 AD 98
 C2A0: A2 C4 8D 03 D0 A9 25 8D C5
 C2A8: 02 D0 A9 81 8D 04 D4 AD BA
 C2B0: 1F D0 AD 02 D0 29 1F D0 3A
 C2B8: 18 AD 00 DC 29 03 AA AD DF
 C2C0: 03 D0 C9 A7 90 0B C9 D7 43
 C2C8: B0 07 18 7D 9B C4 8D 03 07
 C2D0: D0 EE 02 D0 D0 05 A9 02 E4
 C2D8: 8D 10 D0 C0 0A 90 2D 98 68
 C2E0: 10 5E AD 1F D0 29 02 F0 09
 C2E8: 57 A2 80 8E 0B D4 8E 12 72
 C2F0: D4 E8 8E 0B D4 8E 12 D4 92
 C2F8: 38 AD 03 D0 E9 AF 0A AA 01
 C300: BD FD C4 8D 9F C4 BD FE 2F
 C308: C4 8D A0 C4 C8 C0 0A B0 04
 C310: 17 4E A0 C4 6E 9F C4 90 3E
 C318: F3 BE E9 C4 A9 20 DD F6 18
 C320: 06 F0 E9 9D F6 06 E6 FB 7E
 C328: 98 29 01 49 01 0A 48 0A 91
 C330: 0A 8D 0F D4 68 18 69 07 9C
 C338: 8D 08 D4 A2 02 20 79 C3 A4
 C340: A2 03 20 79 C3 AD 10 D0 D1
 C348: F0 07 AD 02 D0 C9 50 B0 8B
 C350: 03 4C B2 C2 A9 80 8D 04 D0
 C358: D4 A9 D7 8D 03 D0 A2 02 B4

C360:	20	79	C3	AC	02	D0	D0	03	11	C530:	02	A0	02	A0	02	00	02	00	79
C368:	8C	10	D0	CE	02	D0	AD	10	35	C538:	02	00	02	00	02	90	50	4C	6B
C370:	D0	D0	EB	88	C0	2D	B0	E6	0C	C540:	41	59	45	52	53	20	28	31	3F
C378:	60	EE	A1	C4	D0	FB	CA	D0	96	C548:	2D	34	29	20	20	9D	00	50	01
C380:	F8	60	A4	04	B9	B0	C4	85	37	C550:	52	45	53	53	20	41	4E	59	97
C388:	02	B9	B4	C4	85	03	BE	B8	BD	C558:	20	4B	45	59	00	31	20	45	F8
C390:	C4	A0	00	84	FD	84	FE	18	14	C560:	58	54	52	41	20	52	4F	4C	AE
C398:	20	F0	FF	A0	01	84	A7	A5	1D	C568:	4C	20	00	20	53	20	2A	20	B2
C3A0:	A7	0A	18	65	A7	A8	20	04	44	C570:	20	2A	90	0D	00	8E	08	93	82
C3A8:	C4	85	A8	8A	C9	20	F0	1F	20	C578:	20	20	20	20	20	20	20	20	79
C3B0:	A2	02	C9	2D	F0	27	CA	C9	F8	C580:	9F	B0	B2	AE	20	B2	C3	AE	77
C3B8:	4E	F0	22	A5	A8	20	18	C4	65	C588:	20	B2	C3	C9	20	B2	C3	C9	49
C3C0:	88	20	04	C4	20	18	C4	E6	16	C590:	20	B2	20	B2	C3	C9	20	D5	B9
C3C8:	A7	A5	A7	C9	0B	90	D0	EE	E2	C598:	C3	C9	0D	20	20	20	20	20	D3
C3D0:	86	02	A6	FD	A5	FE	20	CD	90	C5A0:	20	20	20	20	C2	20	20	AB	CF
C3D8:	BD	CE	86	02	60	8E	AB	C4	4D	C5A8:	C3	20	20	C2	20	C2	20	AB	1E
C3E0:	C8	C8	20	04	C4	E0	20	F0	4D	C5B0:	C3	CB	20	C2	20	C2	20	C2	E8
C3E8:	E6	E0	56	D0	02	C8	C8	18	83	C5B8:	20	CA	C3	C9	0D	20	20	20	9E
C3F0:	65	A8	85	A8	CE	AB	C4	D0	3D	C5C0:	20	20	20	20	20	B1	20	53	
C3F8:	E8	A5	A8	E0	4E	D0	02	A9	DB	C5C8:	20	B1	C3	BD	20	BD	20	AD	C7
C400:	14	4C	C4	C3	B1	02	AA	C9	11	C5D0:	20	B1	20	20	20	B1	20	BD	92
C408:	56	F0	08	C9	4E	F0	04	C9	2E	C5D8:	20	AD	20	CA	C3	CB	0D	00	2E
C410:	2D	D0	02	A9	0A	29	0F	60	5C	C5E0:	01	50	00	05	FC	00	05	FF	39
C418:	18	65	FD	85	FD	A5	FE	69	25	C5E8:	00	0F	FC	00	03	F0	00	2A	13
C420:	00	85	FE	60	A6	FB	98	F0	31	C5F0:	C0	00	AA	80	02	8A	80	02	EB
C428:	05	8A	18	65	FC	AA	86	FC	60	C5F8:	8A	80	00	AA	80	00	2D	40	9C
C430:	E0	0A	90	04	B9	A5	C4	60	34	C600:	00	0D	40	00	05	00	00	05	57
C438:	A5	FB	09	30	60	A0	27	20	5B	C608:	00	00	05	00	00	05	00	00	12
C440:	D2	FF	88	10	FA	60	48	98	E7	C610:	05	00	00	05	00	00	0A	00	24
C448:	48	A2	0F	A0	0E	18	20	F0	1A	C618:	00	05	40	00	00	00	26	00	83
C450:	FF	68	A8	68	20	1E	AB	A2	56	C620:	00	00	00	00	00	00	00	00	20
C458:	00	20	79	C3	A2	0F	20	FF	87	C628:	00	01	50	00	05	FC	00	05	80
C460:	E9	A2	C8	4C	79	C3	A2	01	E2	C630:	FF	00	0F	FC	00	03	F0	00	30
C468:	8E	19	D0	A0	09	AD	12	D0	1B	C638:	0A	C0	00	2A	80	00	2A	80	58
C470:	30	0C	A2	A5	A0	0C	C9	5E	C9	C640:	00	29	80	00	29	80	00	1A	AD
C478:	B0	04	A2	5E	A0	06	8E	12	75	C648:	40	00	16	B0	00	15	BC	06	27
C480:	D0	8C	21	D0	E0	A5	D0	06	2D	C650:	55	50	06	54	50	04	00	A0	45
C488:	AD	A2	C4	8D	01	D0	AD	0D	B7	C658:	04	00	54	00	00	00	00	00	B0
C490:	DC	29	01	F0	03	4C	31	EA	F3	C660:	00	00	00	00	00	00	05	40	A5
C498:	4C	BC	FE	00	01	FF	00	00	A1	C668:	00	17	F0	00	17	FC	00	3F	C3
C4A0:	00	00	00	00	00	D6	CE	03	49	C670:	F0	00	0F	C0	0A	AB	00	2A	11
C4A8:	0D	0E	07	00	5F	6F	7F	8F	A8	C678:	AA	00	38	2A	00	1C	2A	B0	7C
C4B0:	F2	42	92	E2	04	05	05	05	6E	C680:	54	2A	00	54	2A	00	54	15	E6
C4B8:	06	08	0A	0C	C3	20	B1	C2	35	C688:	40	10	15	50	00	55	50	06	E9
C4C0:	DB	C2	DB	C2	DB	C2	B2	BD	0D	C690:	54	50	06	50	50	04	00	A0	80
C4C8:	C2	B3	C2	B3	C2	B3	C2	B2	A1	C698:	04	00	54	00	00	00	00	00	F0
C4D0:	18	12	00	00	80	09	6A	96	85	C6A0:	00	00	00	54	00	01	7F	00	75
C4D8:	08	00	00	00	0A	00	C8	00	B3	C6A8:	01	7F	C0	03	FF	00	00	FC	E9
C4E0:	00	00	00	0A	00	00	1B	A1	A7	C6B0:	00	02	B0	00	0A	A0	00	0A	18
C4E8:	1F	26	27	4F	28	00	50	29	46	C6B8:	A0	00	0A	60	00	0A	60	40	6E
C4F0:	51	01	79	7B	7E	7E	7B	7B	2C	C6C0:	06	9D	50	05	AF	50	01	55	10
C4F8:	7B	7E	7E	7E	7E	00	01	00	6F	C6C8:	50	01	54	40	19	54	00	19	35
C500:	01	00	01	00	01	50	01	50	A4	C6D0:	54	00	10	14	00	10	28	00	81
C508:	01	50	01	50	01	DA	01	DA	62	C6D8:	00	15	00	00	00	00	00	05	F2
C510:	01	DA	01	52	01	FF	03	FF	43	C6E0:	40	00	17	F0	00	17	FC	00	3D
C518:	02	EF	00	FF	00	FF	00	DF	E9	C6E8:	3F	F0	00	0F	C0	00	2B	01	15
C520:	00	FF	01	FF	03	A4	02	EC	B7	C6F0:	00	AA	05	40	A6	F5	40	A5	63
C528:	02	EC	02	EC	02	A0	02	A0	4B	C6F8:	F5	40	AA	81	00	55	00	00	B0

C700: 55 00 00 54 00 00 14 00 BD
 C708: 00 14 00 00 14 00 00 14 44
 C710: 00 00 14 00 00 28 00 00 4C
 C718: 15 00 00 00 00 00 00 2D

•5 REM *** C-128 VERSION *** MN
 •6 REM JD
 •7 REM ===== OM
 •200 F\$="XX" :REM PUT DEFAULT NAME HERE FN
 •210 DOPEN#8,(F\$) DM
 •220 DD=DS : IF DD<>0 THEN GOTO 2000 LE
 •230 REM ***** DD
 •240 REM THIS LOOP READS DATA GK
 •250 REM AND MANIPULATES IT GG
 •260 REM ----- DD
 •270 DO OP
 •280 :N=N+1 : D0=D BA
 •290 :INPUT#8,D GI
 •300 :SS=ST:IF SS<>64 AND SS<>0 THEN 2000 LE
 •310 :PRINT N,D,D-D0 BC
 •320 LOOP UNTIL SS=64 LL
 •330 REM ----- DD
 •340 REM END OF LOOP DL
 •350 REM ***** DD
 •360 DCLOSE AM
 •370 END IC
 •2000 REM --- ERROR HANDLER --- OI
 •2010 DCLOSE : IF DD=62 THEN 2030 NN
 •2020 PRINT :PRINT DS\$:PRINT "I/O STATUS
 ERROR # ";SS : END MB
 •2030 PRINT "FILE "F\$" DOES NOT EXIST." EI
 •2040 F\$="":INPUT"WHAT FILENAME DO YOU WA
 NT (D FOR DIRECTORY; RETURN TO QUIT)";F\$ EG
 •2050 IF F\$="" THEN END CF
 •2060 IF F\$="D" THEN DIRECTORY :GOTO 2040 HC
 •2070 GOTO 210 BP

TONS OF DATA FROM PAGE 20

DATAWRITER (C-128)

•1 REM JD
 •2 REM DATAWRITER JP
 •3 REM RUPERT REPORT #35 ON
 •4 REM JD
 •5 REM *** C-128 VERSION *** MN
 •6 REM JD
 •7 REM ===== IO
 •10 EE\$=CHR\$(27)+"J"+CHR\$(27)+"Q" :REM
 LINE ERASER CB
 •20 F\$="TIME1" :REM DEFAULT FILENAME HK
 •30 DOPEN#8,(F\$),W MG
 •40 DD=DS : IF DD<>0 THEN GOTO 1000 LJ
 •50 REM ***** DD
 •60 REM THIS LOOP GENERATES THE DATA KI
 •70 REM AND WRITES IT TO DISK JH
 •80 REM ----- DD
 •90 FOR N=1 TO 100 PA
 •100 T2=TI[UPARROW]2 LA
 •110 PRINT#8,T2 IM
 •120 SS=ST: IF SS<>0 THEN 1000 IG
 •130 PRINT EE\$;N; :REM SHOW ACTIVITY FO
 •140 NEXT IA
 •150 REM ----- DD
 •160 REM END OF LOOP DL
 •170 REM ***** DD
 •180 DCLOSE AM
 •190 END IC
 •1000 REM --- ERROR HANDLER --- JB
 •1010 DCLOSE : IF DD=63 THEN 1030 PP
 •1020 PRINT :PRINT DS\$:PRINT "I/O STATUS
 ERROR # ";SS : END MB
 •1030 PRINT "FILE "F\$" EXISTS." AC
 •1040 A\$="" : INPUT "DO YOU WANT TO WRITE
 OVER IT (Y/N) (RETURN TO EXIT)";A\$ GJ
 •1050 IF A\$="" THEN END BA
 •1060 IF A\$="Y" THEN SCRATCH(F\$) :GOTO 30 LL
 •1070 IF A\$<>"N" THEN 1040 EE
 •1080 INPUT"WHAT FILENAME DO YOU WANT";F\$ BC
 •1090 GOTO 30 OJ

DATAREADER (C-128)

•1 REM JD
 •2 REM DATAREADER IJ
 •3 REM RUPERT REPORT #35 ON
 •4 REM JD

DATAWRITER (C-64)

•1 REM JD
 •2 REM DATAWRITER - 64 DP
 •3 REM RUPERT REPORT #35 ON
 •4 REM JD
 •5 REM *** C-64 VERSION *** IJ
 •6 REM JD
 •7 REM ===== IO
 •20 F\$="TIME1" :REM DEFAULT FILENAME HK
 •30 OPEN15,8,15:OPEN8,8,8,F\$+"",W" BI
 •40 INPUT#15,DS,DS\$:DD=DS :IF DD<>0 THEN
 GOTO 1000 MB
 •50 REM ***** DD
 •60 REM THIS LOOP GENERATES THE DATA KI
 •70 REM AND WRITES IT TO DISK JH
 •80 REM ----- DD
 •90 FOR N=1 TO 100 PA
 •100 T2=TI[UPARROW]2 LA
 •110 PRINT#8,T2 IM
 •120 SS=ST: IF SS<>0 THEN 1000 IG
 •130 PRINT N; :REM SHOW ACTIVITY NL
 •140 NEXT IA

SYNTAX PATROL FROM PAGE 52

Starting address in hex: C738
Ending address in hex: CC27
SYS to start: 51000

Flanspeed required for entry! See page 121.

```

.150 REM ----- DD
.160 REM          END OF LOOP DL
.170 REM ***** DD
.180 CLOSE8:CLOSE15 BC
.190 END IC
.1000 REM      -- ERROR HANDLER -- JB
.1010 CLOSE8 :CLOSE15 :IF DD=63 THEN 1030 BB
.1020 PRINT :PRINT DS$ :PRINT "I/O STATUS
      ERROR # ";SS : END MB
.1030 PRINT "FILE "F$" EXISTS." AC
.1040 A$="" : INPUT "DO YOU WANT TO WRITE
      OVER IT (Y/N) (RETURN TO EXIT)";A$ CJ
.1050 IF A$="" THEN END BA
.1060 IF A$="Y" THEN OPEN15,8,15,"S:"+F$:
      CLOSE15 : GOTO 30 KH
.1070 IF A$<>"N" THEN 1040 EE
.1080 INPUT"WHAT FILENAME DO YOU WANT";F$ BC
.1090 GOTO 30 OJ
  
```

DATAREADER (C-64)

```

.1 REM          JD
.2 REM          DATAREADER - 64 DB
.3 REM          RUPERT REPORT #35 ON
.4 REM          JD
.5 REM          *** C-64 VERSION *** IJ
.6 REM          JD
.7 REM          ===== OM
.200 F$="XX" BH
.210 OPEN15,8,15 : OPEN8,8,8,F$ LG
.220 INPUT#15,DS,DS$ :DD=DS:IF DD<>0 THEN
      GOTO 2000 MK
.230 REM ***** DD
.240 REM          THIS LOOP READS DATA GK
.250 REM          AND MANIPULATES IT GG
.260 REM          ----- DD
.270 REM          JD
.280 :N=N+1 : D0=D BA
.290 :INPUT#8,D GI
.300 :SS=ST:IF SS<>64 AND SS<>0 THEN 2000 LE
.310 :PRINT N,D,D-D0 BC
.320 IF SS<>64 THEN 280 GL
.330 REM          ----- DD
.340 REM          END OF LOOP DL
.350 REM ***** DD
.360 CLOSE8 : CLOSE15 BG
.370 END IC
.2000 REM      --- ERROR HANDLER --- OI
.2010 CLOSE8 :CLOSE15 :IF DD=62 THEN 2030 AP
.2020 PRINT :PRINT DS$ :PRINT "I/O STATUS
      ERROR # ";SS : END MB
.2030 PRINT "FILE "F$" DOES NOT EXIST." :
      F$="" GM
.2040 INPUT"WHAT FILENAME DO YOU WANT (RE
      TURN TO QUIT)";F$ OI
.2050 IF F$="" THEN END CF
.2060 GOTO 210 BP
  
```

```

C738: A9 C9 CD 03 03 D0 48 AD 46
C740: BD CB D0 23 A2 05 BD B6 D9
C748: CB 9D 68 C0 CA 10 F7 A9 57
C750: AD A2 4C A0 93 8D 00 C0 6F
C758: 8E AA C0 8E FB C0 8C 7C A6
C760: C1 20 6E C7 4C 68 C1 A9 98
C768: 83 A2 A4 20 90 CB 20 56 26
C770: CA A9 8B A2 E3 A0 03 4C E6
C778: 97 CB B9 BD CB F0 07 20 37
C780: D2 FF C8 4C 7A C7 60 20 2B
C788: 44 E5 A2 01 A0 0E 18 20 3D
C790: F0 FF A0 01 20 7A C7 20 A5
C798: E4 FF C9 4E D0 11 8D BD C2
C7A0: CB 20 A7 C7 4C F4 C7 20 25
C7A8: D2 FF A0 3B 4C 7A C7 C9 AF
C7B0: 59 D0 E4 20 A7 C7 8D BD 9A
C7B8: CB A2 04 A0 3F BD B0 CB 45
C7C0: DD 47 C0 D0 B5 CA 10 F5 FD
C7C8: A9 EA A2 02 9D 19 C0 9D 17
C7D0: 68 C0 9D 6B C0 9D 0F C1 32
C7D8: 9D 12 C1 CA 10 EE A9 60 1E
C7E0: 8D 00 C0 8D AA C0 8D FB B1
C7E8: C0 A9 0D 8D 7C C1 20 0F 5B
C7F0: C0 20 7A CA A9 A0 A2 00 04
C7F8: A0 E0 85 FC 86 FB 86 FD 04
C800: 84 FE A1 FB 81 FB A1 FD 3E
C808: 81 FD E6 FB E6 FD D0 F2 13
C810: E6 FC E6 FE D0 EC A9 4C 8D
C818: 8D 96 A4 8D 9C A4 8D 49 86
C820: A7 8D 5D A7 8D 78 A7 8D 95
C828: A5 A7 8D 83 A8 8D 34 A9 9A
C830: 8D 57 A9 8D A5 AB 8D CB F6
C838: AB 8D B8 AA 8D 8D AB 8D 29
C840: 1E AD 8D FC B2 8D 48 B7 D6
C848: 8D 53 B8 8D EA B9 8D 2D CE
C850: E1 8D 59 E1 8D 6F E1 8D 67
C858: C1 E1 A9 0E A2 62 A0 B3 0D
C860: 8D 31 A9 8D FD B2 8E B0 46
C868: AA 8C FE B2 A9 50 A2 CA B8
C870: 8D 97 A4 8E 98 A4 A9 18 C7
C878: A2 CA 8D 9D A4 8E 9E A4 87
C880: A9 95 A2 CA 8D A1 A8 8E 93
C888: A2 A8 A9 01 A2 CB 8D 35 AF
C890: A9 8E 36 A9 A9 85 A2 CA 45
C898: 8D 58 A9 8E 59 A9 A9 A0 04
C8A0: A2 CA 8D 1F AD 8E 20 AD C4
C8A8: A9 09 A2 CB 8D 54 B8 8E F2
C8B0: 55 B8 A9 5D A2 CB 8D EB AD
C8B8: B9 8E EC B9 A9 37 A2 CA F5
  
```

C8C0:	8D	CC	A7	8E	CD	A7	A9	72	E2	CA90:	D0	41	4C	85	CA	C9	30	90	C9
C8C8:	A2	CB	8D	49	B7	8E	4A	B7	56	CA98:	38	C9	3A	B0	34	4C	6B	A9	1B
C8D0:	A9	5C	A2	CB	8D	A4	BF	8E	C5	CAA0:	20	C7	CA	C9	41	90	2C	C9	E4
C8D8:	A5	BF	A9	60	8D	10	03	8D	76	CAA8:	5B	B0	28	20	73	00	F0	28	89
C8E0:	44	A6	8D	BB	A6	8D	59	A8	4B	CAB0:	C9	2C	D0	06	20	73	00	4C	5D
C8E8:	8D	7A	A8	8D	C0	A8	8D	D4	F2	CAB8:	A3	CA	C9	30	90	15	C9	3A	CA
C8F0:	A8	8D	A6	B3	8D	AE	B3	8D	FE	CAC0:	F0	16	90	E7	4C	A3	CA	20	1B
C8F8:	27	B8	8D	3C	B8	8D	50	B8	F1	CAC8:	79	00	F0	0A	C9	3A	F0	06	38
C900:	A2	00	8E	CA	A7	8E	57	AC	36	CAD0:	60	68	68	4C	08	AF	68	68	D6
C908:	8E	DB	AC	8E	13	BB	A9	45	6B	CAD8:	4C	AE	A7	85	FD	86	FE	A6	2B
C910:	8D	A1	AA	A9	9D	A2	AA	8D	0C	CAE0:	7A	E8	CA	30	EC	BD	00	02	EB
C918:	B9	AA	8D	9B	AC	8E	BA	AA	46	CAE8:	C5	FD	D0	F6	E8	30	E2	BD	2E
C920:	A9	AE	A2	A7	8D	A6	A7	8D	2C	CAF0:	00	02	C5	FE	D0	F6	E8	30	98
C928:	52	A8	8D	55	A8	8E	4B	A7	30	CAF8:	D8	BD	00	02	C9	20	F0	F6	63
C930:	8E	5F	A7	8E	7A	A7	8E	A7	AC	CB00:	60	20	FF	AE	F0	CD	4C	40	7A
C938:	A7	8E	53	A8	8E	56	A8	A9	A1	CB08:	A9	A5	6A	F0	23	C9	81	B0	D1
C940:	5A	A2	6D	A0	92	8D	4A	A7	5D	CB10:	1F	A5	69	D0	1B	A5	62	F0	23
C948:	8E	5E	A7	8C	79	A7	A9	A0	D4	CB18:	08	C9	81	B0	0B	A5	61	D0	FE
C950:	A2	A8	8D	84	A8	8E	85	A8	13	CB20:	07	A9	88	85	69	4C	30	CB	90
C958:	A9	0F	A2	B0	A0	0D	8D	FF	9F	CB28:	A5	61	85	69	A5	62	85	6A	16
C960:	B2	8E	00	B3	8C	01	B3	A9	40	CB30:	A5	66	49	FF	4C	57	B8	8E	70
C968:	85	A2	AB	8D	A6	AB	8E	A7	52	CB38:	1F	CC	20	DB	CA	4C	43	CB	46
C970:	AB	A9	08	8D	C2	AB	A9	0B	7E	CB40:	20	F6	CA	C9	00	F0	15	C9	BB
C978:	A2	06	A0	AC	8D	81	AB	8E	B7	CB48:	30	90	F5	C9	3B	90	0D	C9	6B
C980:	CC	AB	8E	8E	AB	8C	8F	AB	89	CB50:	41	90	ED	C9	5B	B0	E9	A9	79
C988:	8C	CD	AB	8C	9C	AC	A9	EA	F8	CB58:	00	8D	1F	CC	60	A9	BC	A2	3B
C990:	9D	90	AA	9D	A8	AB	9D	AD	A6	CB60:	28	20	37	CB	AD	1F	CC	D0	16
C998:	AB	9D	B3	AB	CA	10	F1	8D	9B	CB68:	03	4C	F4	B9	20	2B	BC	4C	BA
C9A0:	4E	A9	8D	11	AB	8D	12	AB	2E	CB70:	ED	B9	20	61	B7	86	FB	84	58
C9A8:	8D	7B	AB	8D	7C	AB	8D	7D	1E	CB78:	FC	A9	CA	A2	2C	20	37	CB	DB
C9B0:	AB	8D	56	B8	A9	F0	A2	03	39	CB80:	A6	FB	A4	FC	AD	1F	CC	D0	2F
C9B8:	A0	05	8D	D0	B4	8E	D1	B4	86	CB88:	03	4C	4D	B7	8A	4C	4B	B7	B6
C9C0:	8C	8F	B7	A9	E7	A2	FF	8D	56	CB90:	8D	02	03	8E	03	03	60	8D	A5
C9C8:	5A	E1	8D	70	E1	8D	C2	E1	17	CB98:	00	03	8E	01	03	B9	A9	CB	5D
C9D0:	8E	5B	E1	8E	71	E1	8E	C3	D0	CBA0:	F0	06	20	D2	FF	C8	D0	F5	1A
C9D8:	E1	A9	FE	A2	C9	20	90	CB	4C	CBA8:	60	4F	4E	00	4F	46	46	00	82
C9E0:	A9	E9	A2	C9	A0	00	4C	97	65	CBB0:	84	FE	20	0A	C1	00	8D	02	AF
C9E8:	CB	AD	00	02	C9	B2	F0	03	D4	CBB8:	03	8E	03	03	00	4E	12	53	04
C9F0:	4C	8B	E3	20	61	CA	A0	00	99	CBC0:	59	4E	54	41	58	20	50	41	08
C9F8:	20	9D	CB	4C	74	A4	20	56	5E	CBC8:	54	52	4F	4C	0D	0D	44	4F	B8
CA00:	CA	A5	2D	A6	2E	85	2F	85	AC	CBD0:	20	59	4F	55	20	57	41	4E	F5
CA08:	31	86	30	86	32	20	61	CA	F4	CBD8:	54	20	54	4F	20	55	53	45	FE
CA10:	A9	35	20	58	CA	4C	83	A4	A6	CBE0:	0D	0D	46	41	49	4C	53	41	AC
CA18:	C9	30	90	0A	C9	3A	B0	06	67	CBE8:	46	45	2C	20	54	4F	4F	3F	F2
CA20:	20	73	00	4C	18	CA	A2	58	DD	CBF0:	20	28	59	2F	4E	29	20	00	59
CA28:	BD	00	02	9D	22	CC	CA	10	4F	CBF8:	0D	0D	00	11	11	11	50	4C	E2
CA30:	F7	20	79	A5	4C	E1	A7	20	5D	CC00:	45	41	53	45	20	4C	4F	41	1C
CA38:	56	CA	A9	00	A2	58	A0	02	A0	CC08:	44	20	46	41	49	4C	53	41	1E
CA40:	85	7A	84	7B	BD	22	CC	9D	8A	CC10:	46	45	2E	2E	2E	11	0D	00	44
CA48:	00	02	CA	10	F7	4C	9C	A4	AA	CC18:	41	48	4F	59	21	21	21	00	AD
CA50:	20	56	CA	4C	96	A4	A9	37	F9	CC20:	00	00	00	00	00	00	00	00	20
CA58:	A2	2F	78	85	01	86	00	58	08										
CA60:	60	AD	BD	CB	D0	FA	20	6F	53										
CA68:	CA	20	6F	C0	4C	7A	CA	A2	B7										
CA70:	03	BD	19	CC	95	FB	CA	10	83										
CA78:	F8	60	A2	03	B5	FB	9D	19	DF										
CA80:	CC	CA	10	F8	60	20	73	00	15										
CA88:	20	95	CA	20	C7	CA	C9	2C	B1										

**All programs in this issue of
Ahoy! are available on disk.
See page 93 for details.**

TELEPORTER FROM PAGE 35

•10 REM *****	CE	FORX=.TO48:POKED+25*64+X,255:NEXT	NI
•15 REM * TELEPORTER *	PB	•160 FORX=48TO63:POKED+25*64+X,.:NEXT	GH
•20 REM *BY CLEVELAND M. BLAKEMORE*	PF	•165 FORX=.TO63:POKED+26*64+X,255:NEXT	GA
•25 REM *****	CE	•170 POKEV+4,250:POKEV+5,216:POKED+1016,2	EH
•30 POKE53281,.:POKE53280,12:DIM A(63,2),	FN	0:POKED+1017,26:POKED+1018,24	EH
S\$(48)	FN	•175 POKED+1019,24:POKEV+6,159:POKEV+7,13	LN
•35 VI=5:K=.:F=.:NB=.:NT=.:W=.:W\$="" :I\$=""	DC	3:POKEV+39,11:POKEV+40,PEEK(V+33)	LN
[WHITE]:C\$I:D\$I:C=.:CL=.:SB=.:SC=.:L=.	DC	•180 A=780:X=781:Y=782:P=783:POKEV+2,159:	IM
•40 X\$="[BLACK]":R\$="[RVSON]"	LJ	GOSUB380	IM
•45 X=RND(-TI/37):PLOT=65520:PRINT"[CLEAR	LJ	•185 POKEV+3,133:S=54272:FORSC=STOS+24:PO	KP
][BLUE][3"[RIGHT]] PLEASE WAIT[3"."]INI	OI	KESC,.:NEXT	KP
TIALIZING GAME."	OI	•190 GOSUB510:PRINTS\$(.)	EE
•50 S\$(.)="[c 8][RVSOFF]&[RVSON]CAPTAIN:[	LP	•195 POKES+1,34:POKES,10:POKES+5,129:POKE	EH
30" "]:S\$(1)="STAND BY [5"."]"	LP	S+6,129:POKES+24,10:POKES+4,129	EH
•55 S\$(2)="PREPARE FOR ":S\$(3)="KRELL":S\$(	PD	•200 POKEV+21,27:FORSC=26TO255:POKED+1016	PH
4)="ALGON":S\$(5)="BETA IV":S\$(6)="CETA	PD	,SC:POKED+1020,SC:NEXT:GOSUB550	PH
•60 S\$(7)="ALPHAN":S\$(8)="SOL":S\$(9)="TIR	CE	•205 POKED+1020,25:POKED+1016,20:POKES+4,	CI
US":S\$(10)="AMBASSADOR":S\$(11)="TRADER	CE	.:GOSUB510:PRINTTAB(9)S\$(1)	CI
•65 S\$(12)="CREWMEMBER":S\$(13)="PILOT":S\$(	PP	•210 F=.:GOSUB640:R%=22+RND(0)*3:IFRND(1)	BF
14)="ENGINEER":S\$(15)="INSPECTOR	PP	>.5THENF=1	BF
•70 S\$(16)="OFFICER":S\$(17)="PASSING THRU	BI	•215 NB=INT(RND(1)*45+50):NT=INT(RND(1)*3	LI
RADIATION STORM"	BI	0+65)	LI
•75 S\$(18)=" \$%# COMPUTER ON THE FRITZ !	AE	•220 NB=NB+INT(RND(1)*10)/10:NT=NT+INT(RN	BK
:S\$(19)="TRANSMISSION GARBLED!"	AE	D(1)*10)/10:POKED+1018,R%	BK
•80 S\$(20)="PHONY[3"."]":S\$(21)="WE TRY T	BB	•225 POKED+1019,R%:IFFANDRND(1)*7>LTHENPO	BL
O CONSERVE ENERGY HERE":S\$(22)="LUNCHTIM	BB	KED+1019,22+INT(RND(0)*3)	BL
E	BB	•230 GOSUB550	CO
•85 S\$(23)="METEOR BELT-TURBULENCE AHEAD"	OB	•235 N\$=S\$(3+(RND(1)*7)):T\$=S\$(10+(RND(1)	FO
:S\$(24)="ANOTHER ALIEN FREELoader."	OB	*7)):N\$=N\$+CHR\$(32)+T\$	FO
•90 S\$(25)="YOU JUST FRIED THE ":S\$(26)="	CA	•240 GOSUB510:PRINTTAB(9);CHR\$(18);S\$(2);	LM
YOU'RE FIRED!GET OFF MY SHIP!"	CA	N\$;CHR\$(19):GOSUB550	LM
•95 S\$(27)="GOOD JOB."	LE	•245 POKEX,20:POKEY,16:POKEP,.:SYSPLOT:PR	MG
•100 FORX=.TO10:READA\$:S\$(28+X)=A\$:NEXT	FP	INTI\$;MID\$(STR\$(NB)+"."0",2,4);	MG
•105 FORX=.TO9:READA\$:S\$(39+X)=A\$:NEXT	BA	•250 POKEX,22:POKEY,16:POKEP,.:SYSPLOT:PR	NE
•110 FORX=.TO32:READA\$:POKE679+X,A:NEXT	JK	INTMID\$(STR\$(NT)+"."0",2,4);	NE
•115 POKE56334,PEEK(56334)AND254	DN	•255 POKED+1016,21:POKEV+37,RND(0)*10:POK	PD
•120 POKE1,PEEK(1)AND251:SYS679:POKE1,PEE	GD	EV+38,RND(0)*10:POKEV+41,RND(0)*10	PD
K(1)OR4:POKE56334,PEEK(56334)OR1	GD	•260 POKEV+42,PEEK(V+41):IFFANDRND(1)*12>	AA
•125 READA:IFA=-1THEN135	KJ	LTHENPOKEV+42,RND(0)*10	AA
•130 FORX=.TO7:READD:POKE61440+A*8+X,D:NE	DE	•265 POKEV+21,PEEK(V+21)OR4	LH
XT:GOTO125	DE	•270 W=INT(RND(0)*5)*2:W\$=S\$(39+W)	LE
•135 POKE648,192:PRINT"[CLEAR][3"[DOWN]]	AN	•275 POKEX,20:POKEY,23:POKEP,.:SYSPLOT:PR	GL
[RIGHT][RIGHT][RVSON] WELCOME ABOARD THE	AN	INTW\$;:GOSUB550	GL
U.S.S. NEFARIUS !"	ID	•280 GOSUB640:IFL>12THENGOSUB565	DJ
•140 POKE56576,PEEK(56576)AND252:POKE5327	ID	•285 GOSUB550:FORSC=STOS+24:POKESC,.:NEXT	EJ
2,12:V=53248:POKEV+21,.	ND	:POKES,.:POKES+5,8	EJ
•145 D=49152:FORX=.TO319:READA\$:POKED+20*6	ND	•290 POKES+6,123:POKES+24,15:POKES+4,21:S	BB
4+X,A:NEXT:POKEV,92:POKEV+1,208	ND	C=133	BB
•150 POKEV+8,240:POKEV+9,210:POKEV+23,27:	PD	•295 FORIR=.TO1:F1=PEEK(V+3):POKES+15,F1*	EH
POKEV+43,14	PD	.1:POKES+1,F1*.01	EH
•155 POKEV+27,23:POKEV+28,12:POKEV+29,27:	PD	•300 EC=(INT(RND(1)*VI)+INT(RND(1)*8*F))*	HE
	PD	.1:VI=-VI	HE
	PD	•305 POKEX,20:POKEY,16:POKEP,.:SYSPLOT:PR	DP
	PD	INTC\$;MID\$(STR\$(NB+EC)+"."0",2,4);	DP
	PD	•310 PRINT"[DOWN][DOWN][4"[LEFT]]";MID\$(	JK
	PD	STR\$(NT+EC)+"."0",2,4);	JK

```

315 IFSBTHENPOKEV+22,(PEEK(V+22)AND248)O
RRND(1)*8 NK
320 POKEY,22:POKEY,23:POKEY,..:SYSLOT:PR
INTD$;S$(39.6+W+ABS(EC)):NEXT LG
325 POKED+1016,21.5-ABS(EC)-(RND(1)*.1) PI
330 IFPEEK(56321)=239THEN615 CI
335 SC=SC-1:POKEV+3,SC:IFSC>90THEN295 EC
340 POKEV+22,(PEEK(V+22)AND248):POKES+4,
. MI
345 GOSUB510:PRINTS$(.);:GOSUB510 JA
350 IFFTHENPRINTTAB(9)S$(24);:POKED+1016
,20:K=K+1:GOSUB640:GOSUB520:GOTO360 LM
355 GOSUB550:PRINTTAB(9)S$(27);:POKED+10
16,21 HE
360 L=L+1:GOSUB640:C$=I$:D$=I$:POKEV+21,
27:SB=. OI
365 IFL<21THENGOSUB550:GOTO185 DD
370 IFK>6THENGOSUB510:PRINTS$(.);:GOSUB5
10:PRINTTAB(9);S$(26); LF
375 GOTO650 CH
380 PRINT"[CLEAR]"TAB(8)"[c 5][s M][22"[
c @]"[s N] KL
385 PRINTTAB(9)"[s T][RVSON][sEP][3" "[
TELEPORTER[3" "[c *][RVSOFF][s Y] NA
390 PRINTTAB(9)"[s T][RVSON][sEP][18"[c
@]"[c *][RVSOFF][s Y] CO
395 PRINTTAB(9)"[s T][RVSON][20"[s V]"[
RVSOFF][s Y] EI
400 PRINTTAB(9)"[s T][4" "[s T][RVSON][
10"[c T]"[RVSOFF][s Y][4" "[s Y] BF
405 PRINTTAB(9)"[s T][4" "[s T][RVSON]
[8"[s W]"[RVSOFF][s Y][4" "[s Y] CI
410 PRINTTAB(9)"[s T][4" "[s T][RVSON]
[s W][6" "[s W][RVSOFF][s Y][4" "[s Y] IF
415 PRINTTAB(9)"[s T][4" "[s T][RVSON]
[s W][sEP][c *][s W][RVSOFF][s Y][4
" "[s Y] BO
420 PRINTTAB(9)"[s T][4" "[s T][RVSON]
[s W][sEP][c *][s W][RVSOFF][s Y][4
" "[s Y] ND
425 PRINTTAB(9)"[s T][4" "[s T][RVSON]
[s W][c *][sEP][s W][RVSOFF][s Y][4
" "[s Y] PC
430 PRINTTAB(9)"[s T][4" "[s T][RVSON]
[s W][c *][sEP][s W][RVSOFF][s Y][4
" "[s Y] ND
435 PRINTTAB(9)"[s T][4" "[s T][RVSON]
[s W][6" "[s W][RVSOFF][s Y][4" "[s Y] FN
440 PRINTTAB(9)"[s T][4" "[s T][RVSON]
[8"[s W]"[RVSOFF][s Y][4" "[s Y] OF
445 PRINTTAB(9)"[s T][4" "[s T][RVSON]
[9"[c @]"[RVSOFF][s Y][4" "[s Y] KK
450 PRINTTAB(8)"[s N][3" "[c Y]"[RVSON][s
EP][s N][s N][s O][6" "[c Y]"[s P][s M]
[s M][c *][RVSOFF][3" "[c Y]"[s M] PB
455 PRINTTAB(7)"[s N][3" "[RVSON][sEP][

```

```

s N][c @][s N][RVSOFF][sEP][8" "[c *][R
VSON][s M][c @][s M][c *][RVSOFF][3" "[
s M] FH
460 PRINTTAB(6)"[s N][3" "[RVSON][sEP][
18"[c @]"[c *][RVSOFF][3" "[s M] EC
465 PRINTTAB(5)"[s N][4" "[RVSON][20"[s
V]"[RVSOFF][4" "[s M] OG
470 PRINTTAB(4)"[s N]"SPC(30)"[s M]" OG
475 PRINTTAB(3)"[s N][RVSON][sEP][c G]
[c A]HELM[s C][c R][5" "[s C]"[c R][5" "[s
C]"[c R]IMAGE[s C][c M][c *][RVSOFF][s
M] DA
480 PRINTTAB(2)"[s N][RVSON][sEP][s Q]
[c G][s B][RVSOFF][5" "[RVSON][s B][c 6
]B[RVSOFF][c 5][4" "[RVSON][s B][c 6]R[
BACKARROW][RVSOFF][c 5][3" "[RVSON][s B
][RVSOFF][6" "[RVSON][c M][s Q][c *][RV
SOFF][s M] LK
485 PRINT"[s N][RVSON][sEP][s Q][c G]
[s B][RVSOFF][5" "[RVSON][s B][c 6][R
VSOFF][c 5][4" "[RVSON][s B][c 6][RVS
OFF][c 5][3" "[RVSON][s B][RVSOFF][6" "
][RVSON][c M][s Q][c *][RVSOFF][s M] IH
490 PRINT"[s N][RVSON][sEP][s W][c G]
[s B][RVSOFF][5" "[RVSON][s B][c 6]T[R
VSOFF][c 5][4" "[RVSON][s B][c 6]W[BACK
ARROW][RVSOFF][c 5][3" "[RVSON][s B][RV
SOFF][6" "[RVSON][c M][s W][c *][RVSO
FF][s M]"; OA
495 PRINT"[RVSON][sEP][s Q][3" "[c G]
[s B][RVSOFF][5" "[RVSON][s B][c 6][RV
SOFF][c 5][4" "[RVSON][s B][c 6][RVSO
FF][c 5][3" "[RVSON][s B][RVSOFF][6" "
][RVSON][c M][3" "[s Q][c *][RVSOFF]";S
$(0); NK
500 PRINTCHR$(157);CHR$(148);CHR$(32);CH
R$(19);:RETURN FA
505 REM SET CURSOR KC
510 POKEY,..:POKEY,..:POKEY,24:SYSLOT:RET
URN KI
515 REM ABORT/FRY ALIEN BM
520 FORSC=STOS+24:POKESC,..:NEXT:POKES+1,
10:POKES+5,75:POKES+6,30:POKES,25 CK
525 POKES+24,15:POKES+4,23:POKEV+3,90 ON
530 GOSUB510:PRINTS$(.);:GOSUB510:PRINTT
AB(9)"[RVSON][c 8][s +][s +][s +][s +
][s +]ABORT![s +][s +][s +][s +][
HOME]"; II
535 FORSC=.TO64:PRINTCHR$(14);:POKEV+33,
SC:PRINTCHR$(142);:POKES+15,SC:NEXT BM
540 POKEV+3,133:POKES+4,..:GOSUB550:GOSUB
640:GOSUB510:PRINTS$(.);:RETURN KP
545 REM BEEP NA
550 FORSC=STOS+24:POKESC,..:NEXT:POKES+24
,15 HB
555 POKES+1,25:POKES,5:POKES+5,20:POKES+
6,20:POKES+4,33:FORSC=.TO75:NEXT FI
560 POKES+4,..:RETURN PF

```

```

•565 GOSUB510:PRINTS$(.);:GOSUB510:PRINTT
AB(9);
•570 ONL-12GOSUB580,605,580,585,590,595,6
00,605
•575 GOSUB640:GOSUB510:PRINTS$(.);:RETURN
•580 C$=X$:PRINTS$(18);:RETURN
•585 POKEV+21,30:PRINTS$(22);:RETURN
•590 D$=X$:SB=1:PRINTS$(17);:RETURN
•595 POKED+1018,RND(0)*3+22:PRINTS$(19);:
RETURN
•600 C$=X$:D$=X$:PRINTS$(21);:RETURN
•605 SB=1:D$=X$:PRINTS$(23);:RETURN
•610 REM CHECK FOR CORRECT ABORT
•615 POKEV+22,PEEK(V+22)AND248
•620 GOSUB520:GOSUB510:IFFTHENPRINTTAB(9)
S$(20);:GOSUB510:GOTO355
•625 GOSUB510:PRINTS$(.);:GOSUB510:PRINTT
AB(9)S$(25);T$;"!";:K=K+1:GOSUB510
•630 POKED+1016,20:GOSUB640:GOTO360
•635 REM DELAY
•640 FORSC=,TO3000:NEXT:RETURN
•645 REM RATE PERFORMANCE
•650 GOSUB550:GOSUB640:GOSUB550
•655 GOSUB510:PRINTS$(.);:GOSUB510:PRINTT
AB(9)R$;"RATING[s C][s C]>";
•660 FORX=,TO10:IFX*2=20-KORX*2+1=20-KTHE
NPRINTS$(28+X);:GOSUB550
•665 NEXT:GOSUB640:GOSUB640:GOSUB550
•670 POKE648,4:POKE679,.:SYS679
•675 REM RATINGS
•680 DATA RAW RECRUIT,SPACE CADET,ENSGN,
SPECIALIST,LIEUTENANT,1ST LIEUTENANT
•685 DATA CAPTAIN,MAJOR,ADMIRAL,GALACTIC
WHIZ KID,REGULAR RICKY ROCKET
•690 REN WAVEFORM DATA
•695 DATA $$$,%%,$$$,$$$,*(*,(,),(,)(
,$%,%$$
•700 REM ML COPYDOWN ROUTINE
•705 DATA 169,,133,251,133,253,169,208,13
3,252,169,240,133,254,162,8
•710 DATA 160,,177,251,145,253,136,208,24
9,230,252,230,254,202,208,240,96
•715 REM CHARACTER DATA
•720 DATA036,000,004,010,017,160,064,000,
000
•725 DATA037,000,032,080,136,005,002,000,
000
•730 DATA038,239,199,147,147,131,131,147,
187
•735 DATA040,000,056,040,040,239,000,000,
000
•740 DATA041,000,000,000,000,251,010,010,
014
•745 DATA042,000,016,040,040,199,000,000,
000,-1

```

```

IG
CH
IF
OP
IE
HI
LH
GA
AL
PM
AB
IP
KA
NF
DG
BI
FD
BB
CD
AN
IC
BK
MI
DB
CH
LG
FJ
AK
FE
MA
KP
ML
IK
BM
AF
PG
AK
MM
BN
PO
GB
FC
FB
PD
NF
KP
BN
PP
EK
PJ
PC
PD
NF
KP
KE
NB
ID
PB
AG
MM
BM
LN
NN
EJ
HK
KA
ID
AE
OL
CG
ND
FJ
GP
PA
MC
IJ
NO
GC
OG
JJ
EH
OG
JD
CG
CG
NE

```

LONG LINES FROM PAGE 73

```

•100 REM *****
•110 REM * LONG LINES *
•120 REM * BY RICK NASH 5/28/86 *
•130 REM *****
•140 REM
•150 PRINTCHR$(147):PRINT:PRINTTAB(7)"-CH
ECKING DATA STATEMENTS-"
•160 CK=0:FORI=49152TO49337:READD:POKEI,D
:CK=CK+D:NEXT

```

```

•170 IFCK<>30183THENPRINT:PRINTTAB(8)"ERR
OR IN DATA STATEMENTS":END LD
•180 PRINTCHR$(147):PRINT:PRINTTAB(10)"DI
SK OR TAPE (D/T) ";:INPUTA$ KN
•190 IFLEFT$(A$,1)="T"THENDV$="PREPARE TA
PE":DV=1:GOTO220 MH
•200 IFLEFT$(A$,1)="D"THENDV$="INSERT DIS
K":DV=8:GOTO220 EG
•210 GOTO180 CN
•220 PRINT:PRINTTAB(4)DV$", THEN PRESS <R
ETURN>" CI
•230 GETA$:IFA$<>CHR$(13)THEN230 DG
•240 PRINT:PRINTTAB(13)"-WRITING FILE- HJ
•250 F$="LONG LINES":POKE251,PEEK(71):POK
E252,PEEK(72) HG
•260 AD=PEEK(251)+PEEK(252)*256 CC
•270 POKE183,PEEK(AD):POKE187,PEEK(AD+1):
POKE188,PEEK(AD+2) BC
•280 POKE184,DV:POKE186,DV:POKE185,1 PE
•290 POKE251,0:POKE252,192:POKE780,251:PO
KE781,186:POKE782,192:SYS65496 AF
•300 PRINTCHR$(147):PRINT:PRINTTAB(17)"DO
NE!!":END OJ
•310 DATA 169,0,168,133,251,133,253,162 FJ
•320 DATA 160,134,252,162,224,134,254,177 PB
•330 DATA 251,145,251,177,253,145,253,200 ED
•340 DATA 208,245,230,252,166,254,232,208 BI
•350 DATA 236,165,1,41,253,133,1,162 GN
•360 DATA 21,189,96,165,157,192,192,202 NO
•370 DATA 16,247,162,29,189,202,170,157 AI
•380 DATA 214,192,202,16,247,162,0,160 AN
•390 DATA 0,189,107,192,240,15,133,251 LN
•400 DATA 189,134,192,133,252,189,160,192 HB
•410 DATA 145,251,232,208,236,96,165,95 IA
•420 DATA 208,2,198,96,198,95,164,11 PF
•430 DATA 185,251,192,145,95,136,208,248 NN
•440 DATA 76,42,165,203,218,222,132,186 NL
•450 DATA 205,208,231,241,6,11,245,19 OP
•460 DATA 22,206,31,32,33,132,133,253 NE
•470 DATA 252,162,180,194,255,0,192,192 PC
•480 DATA 192,165,165,165,165,165,165,166 GB
•490 DATA 166,164,165,165,192,165,165,165 NO
•500 DATA 164,164,192,192,232,232,230,231 FH
•510 DATA 193,193,192,193,193,192,192,193 FN
•520 DATA 192,193,192,193,192,192,176,76 MA
•530 DATA 86,192,192,192,1,1,4,4 BH
•540 DATA 159,159 BM

```

```

C010: DD C0 99 C0 0C C8 C0 FF 9E
C018: D0 F5 4C 41 C3 00 00 00 30
C020: 00 00 00 00 00 00 00 00 20
C028: 00 00 00 00 00 00 00 00 28
C030: 00 00 00 00 00 00 00 00 30
C038: 00 00 00 00 00 00 00 00 38
C040: 00 04 00 20 08 7E 10 18 13
C048: FF 18 28 FF 14 08 FF 10 B4
C050: 7F 99 FE DF FF FB 7B FF BF
C058: DE 31 E7 8C 00 00 00 00 DC
C060: 00 00 00 00 00 00 00 00 60
C068: 00 00 00 00 00 00 00 00 68
C070: 00 00 00 00 00 00 00 00 70
C078: 00 00 00 00 00 00 00 00 78
C080: 00 00 01 FC 00 00 FE 00 7D
C088: 01 FE 00 70 0E 00 F8 0E 0E
C090: 0F FF FF 1F FF F7 3E 03 F7
C098: EF 7F FF FF 00 00 00 00 08
C0A0: 00 00 00 00 00 00 00 00 A0
C0A8: 00 00 00 00 00 00 00 00 A8
C0B0: 00 00 00 00 00 00 00 00 B0
C0B8: 00 00 00 00 00 00 00 00 B8
C0C0: 00 00 00 F0 00 01 FC 00 AF
C0C8: 00 F0 00 00 00 00 00 00 B9
C0D0: 00 00 00 00 00 00 00 00 D0
C0D8: 00 00 00 00 3F 00 00 00 18
C0E0: 00 00 00 00 00 00 00 00 E0
C0E8: 00 00 00 00 00 00 00 00 E8
C0F0: 00 00 00 00 00 00 00 00 F0
C0F8: 00 00 00 00 00 00 00 00 F8
C100: 00 00 00 00 01 80 00 01 82
C108: 80 00 0F F0 00 01 80 00 0A
C110: 01 80 00 02 40 00 02 40 16
C118: 00 06 60 00 06 00 00 00 84
C120: 00 00 00 00 00 00 00 00 20
C128: 00 00 00 00 00 00 00 00 28
C130: 00 00 00 00 00 00 00 00 30
C138: 00 00 00 00 00 00 00 00 38
C140: 00 00 00 00 09 90 00 05 DE
C148: A0 00 03 C0 00 01 80 00 2E
C150: 01 80 00 01 40 00 01 40 54
C158: 00 03 60 00 06 00 00 00 C1
C160: 00 00 00 00 00 00 00 00 60
C168: 00 00 00 00 00 00 00 00 68
C170: 00 00 00 00 00 00 00 00 70
C178: 01 20 00 01 E0 00 01 20 9C
C180: 00 00 00 00 00 00 00 00 80
C188: 00 00 00 00 00 00 00 00 88
C190: 00 00 00 00 00 00 00 00 90
C198: 00 00 00 00 00 00 E0 FC 76
C1A0: FE FF FE FC E0 00 00 00 7C
C1A8: 00 00 00 00 00 08 08 1C D4
C1B0: 7F 1C 08 08 00 FF FF FF 5C
C1B8: FF FF FF FF FF 20 20 20 19
C1C0: 20 20 20 10 15 13 08 20 81
C1C8: 0A 0F 19 13 14 09 03 0B 39
C1D0: 20 02 15 14 14 0F 0E 20 6D
C1D8: 14 0F 20 13 14 01 12 14 6A

```

DISCS OF DAEDALUS FROM PAGE 55

Starting address in hex: C000

Ending address in hex: CC4F

SYS to start: 49152

Flankspeed required for entry! See page 121.

```

C000: A0 00 B9 1D C0 99 00 0C DD
C008: C8 C0 FF D0 F5 A0 00 B9 B2

```

C1E0:	07	01	0D	05	20	02	16	05	38	C3B0:	0E	DC	A9	1C	8D	18	D0	A0	78
C1E8:	12	A0	00	A9	9F	85	FB	A9	10	C3B8:	00	B9	9D	C1	99	10	31	C8	75
C1F0:	04	85	FC	18	A5	FB	69	01	9B	C3C0:	C0	49	D0	F5	20	3A	C2	A0	4F
C1F8:	85	FB	A5	FC	69	00	85	FC	09	C3C8:	00	A9	25	99	78	04	A9	07	5E
C200:	A9	20	91	FB	A5	FB	C9	E9	AC	C3D0:	99	78	D8	C8	C0	28	D0	F1	30
C208:	D0	E9	A5	FC	C9	07	D0	E3	EA	C3D8:	A9	30	8D	23	04	8D	25	04	1E
C210:	60	A0	00	A9	9F	85	FB	A9	85	C3E0:	8D	24	04	A9	33	8D	02	04	07
C218:	D8	85	FC	18	A5	FB	69	01	97	C3E8:	A0	00	B9	BD	C1	99	61	04	C1
C220:	85	FB	A5	FC	69	00	85	FC	30	C3F0:	C8	C0	06	D0	F5	A9	01	A0	92
C228:	AD	40	03	91	FB	A5	FB	C9	12	C3F8:	00	99	00	D8	C8	C0	53	D0	19
C230:	E9	D0	E8	A5	FC	C9	DB	D0	EC	C400:	F8	A9	00	8D	21	D0	A9	07	D2
C238:	E2	60	20	E9	C1	A0	00	A9	91	C408:	8D	20	D0	A9	0F	8D	18	D4	B9
C240:	20	99	00	04	C8	C0	A2	D0	FA	C410:	20	D8	CA	AD	41	03	8D	49	9C
C248:	F8	60	AD	25	04	C9	39	F0	6C	C418:	03	A9	B0	8D	00	D0	A9	00	7D
C250:	0A	EE	25	04	AD	25	04	8D	D6	C420:	8D	10	D0	A9	01	8D	15	D0	AC
C258:	25	04	60	A9	30	8D	25	04	72	C428:	20	E9	C1	A9	03	8D	40	03	71
C260:	AD	25	04	C9	39	F0	0A	EE	24	C430:	20	11	C2	AD	FA	03	D0	0B	AB
C268:	24	04	AD	24	04	8D	24	04	1C	C438:	20	F3	C2	A9	DF	8D	01	D0	F7
C270:	60	A9	30	8D	24	04	AD	23	31	C440:	4C	4B	C4	20	D9	C2	A9	46	49
C278:	04	C9	39	F0	0A	EE	23	04	90	C448:	8D	01	D0	A9	30	8D	F8	07	0F
C280:	AD	23	04	8D	23	04	60	A9	14	C450:	A9	08	8D	27	D0	AD	FA	03	33
C288:	30	8D	25	04	8D	24	04	8D	B2	C458:	D0	0D	A9	DF	8D	01	D0	A9	C8
C290:	23	04	60	A9	0E	8D	40	03	A0	C460:	01	8D	15	D0	4C	6C	C4	A9	FB
C298:	20	11	C2	A9	FF	8D	0E	D4	A6	C468:	01	8D	15	D0	AD	1F	D0	A9	24
C2A0:	8D	0F	D4	A9	81	8D	12	D4	B1	C470:	00	8D	0B	D4	18	AD	00	DC	80
C2A8:	A9	20	8D	FF	03	A0	00	AD	51	C478:	29	1F	C9	0F	D0	03	4C	FE	B8
C2B0:	42	03	85	FB	A9	04	85	FC	A7	C480:	C4	18	A9	00	8D	0B	D4	AD	22
C2B8:	A2	03	A5	FB	6D	1B	D4	85	E2	C488:	00	DC	29	1F	C9	17	D0	03	62
C2C0:	FB	A5	FC	69	00	85	FC	18	63	C490:	4C	06	C5	C9	1B	D0	03	4C	AD
C2C8:	CA	D0	EF	AD	43	03	91	FB	D5	C498:	60	C5	AD	48	03	F0	D0	20	99
C2D0:	CE	FF	03	AD	FF	03	D0	D7	FB	C4A0:	A8	CA	AC	47	03	A2	64	CA	DC
C2D8:	60	A9	EB	8D	42	03	A9	24	6F	C4A8:	D0	FD	88	D0	F8	AD	FA	03	75
C2E0:	8D	43	03	20	93	C2	A0	00	CB	C4B0:	D0	0B	CE	01	D0	AD	01	D0	AC
C2E8:	A9	20	99	A0	04	C8	C0	78	F2	C4B8:	C9	46	4C	C5	C4	EE	01	D0	60
C2F0:	D0	F8	60	A9	A0	8D	42	03	38	C4C0:	AD	01	D0	C9	DF	D0	13	CE	9C
C2F8:	A9	24	8D	43	03	20	93	C2	11	C4C8:	49	03	AD	49	03	D0	03	4C	2F
C300:	A0	00	A9	20	99	70	07	C8	44	C4D0:	92	C5	A9	01	8D	48	03	4C	F8
C308:	C0	79	D0	F8	60	A9	00	8D	A3	C4D8:	19	C4	AD	1F	D0	29	01	C9	48
C310:	04	D4	A9	2D	8D	01	D4	A9	CC	C4E0:	01	D0	18	20	0D	C3	AD	02	6B
C318:	C6	8D	00	D4	A9	80	8D	05	FD	C4E8:	04	C9	30	F0	0B	CE	02	04	B7
C320:	D4	A9	80	8D	06	D4	A9	21	52	C4F0:	A9	00	8D	48	03	4C	19	C4	9D
C328:	8D	04	D4	A0	FF	A2	FF	8C	5E	C4F8:	4C	70	CA	4C	81	C4	A9	01	BD
C330:	01	D4	8C	27	D0	CA	D0	F7	1E	C500:	8D	48	03	4C	9A	C4	AD	00	32
C338:	88	D0	F2	A9	00	8D	04	D4	94	C508:	D0	C9	40	D0	0A	AD	10	D0	4C
C340:	60	20	3A	C2	A9	02	8D	40	37	C510:	C9	01	D0	03	4C	93	C4	20	73
C348:	03	20	11	C2	A9	00	8D	21	97	C518:	90	CA	AD	47	03	E9	14	A8	12
C350:	D0	A0	00	B9	C3	C1	99	0E	A8	C520:	A2	64	CA	D0	FD	88	D0	F8	13
C358:	06	C8	C0	1D	D0	F5	AD	00	79	C528:	EE	00	D0	AD	00	D0	D0	05	3C
C360:	DC	29	1F	C9	0F	D0	F7	A9	D0	C530:	A9	01	8D	10	D0	AD	1F	D0	E6
C368:	01	8D	41	03	A9	00	8D	48	BA	C538:	18	29	01	8D	4A	03	AD	4A	4D
C370:	03	A9	01	8D	45	03	A9	32	CF	C540:	03	C9	01	D0	18	20	0D	C3	E7
C378:	8D	47	03	A9	01	8D	FA	03	86	C548:	AD	02	04	C9	30	F0	0B	CE	C0
C380:	AD	0E	DC	29	FE	8D	0E	DC	B9	C550:	02	04	A9	00	8D	48	03	4C	25
C388:	A5	01	29	FB	85	01	A0	00	7B	C558:	19	C4	4C	70	CA	4C	9A	C4	69
C390:	B9	00	D0	99	00	30	C8	D0	7E	C560:	AD	00	D0	C9	18	D0	08	AD	47
C398:	F7	A0	00	B9	FE	D0	99	FE	53	C568:	10	D0	D0	03	4C	93	C4	20	E1
C3A0:	30	C8	D0	F7	A5	01	09	04	16	C570:	90	CA	AD	47	03	E9	14	A8	6A
C3A8:	85	01	AD	0E	DC	09	01	8D	5F	C578:	A2	64	CA	D0	FD	88	D0	F8	6B

C580:	CE 00 D0 AD 00 D0 C9 FF 68	C750:	08 D0 AD 08 D0 C9 FF D0 4A
C588:	D0 05 A9 00 8D 10 D0 4C C2	C758:	08 AD 10 D0 29 EF 8D 10 A5
C590:	35 C5 20 D8 CA AD FA 03 FA	C760:	D0 4C 8A C7 AD 08 D0 C9 20
C598:	D0 03 4C F2 C8 A9 00 8D AB	C768:	40 D0 0F AD 10 D0 29 10 50
C5A0:	EB 03 A9 00 8D ED 03 A9 61	C770:	C9 10 D0 06 CE 08 D0 4C 15
C5A8:	01 8D EE 03 20 E9 C1 A9 9E	C778:	8A C7 EE 08 D0 AD 08 D0 19
C5B0:	34 8D FC 07 A9 01 8D 2B D9	C780:	D0 08 AD 10 D0 09 10 8D 8E
C5B8:	D0 A9 E5 8D 09 D0 A9 96 C0	C788:	10 D0 AD 1B D4 29 15 D0 16
C5C0:	8D 08 D0 A9 08 8D 27 D0 5E	C790:	14 AD FC 07 C9 34 D0 08 2D
C5C8:	A9 B0 8D 00 D0 A9 67 8D 20	C798:	A9 33 8D FC 07 4C A5 C7 C0
C5D0:	01 D0 A9 31 8D F9 07 A9 B5	C7A0:	A9 34 8D FC 07 AD EC 03 AD
C5D8:	0D 8D 28 D0 A9 40 8D 02 E5	C7A8:	D0 15 AD 03 D0 C9 47 D0 F1
C5E0:	D0 A9 02 8D 10 D0 A9 95 0B	C7B0:	08 A9 01 8D EC 03 4C D1 FE
C5E8:	8D 03 D0 A9 03 8D 29 D0 7E	C7B8:	C7 CE 03 D0 4C D1 C7 AD B6
C5F0:	A9 32 8D FA 07 A9 0E 8D A1	C7C0:	03 D0 C9 AD D0 08 A9 00 8E
C5F8:	2A D0 A9 35 8D FB 07 A9 0D	C7C8:	8D EC 03 4C D1 C7 EE 03 1E
C600:	13 8D 15 D0 A9 00 8D 05 C2	C7D0:	D0 20 D7 C7 4C 3D C8 AD 61
C608:	D4 8D 06 D4 8D 0C D4 8D 41	C7D8:	EB 03 D0 2D AD 1B D4 29 8C
C610:	0D D4 AD 1E D0 A9 00 8D C5	C7E0:	07 F0 03 4C 3C C8 AD 10 EA
C618:	4A 03 18 A9 00 8D 0B D4 94	C7E8:	D0 09 04 8D 10 D0 A9 01 DF
C620:	8D 04 D4 AD 00 DC 29 1F 59	C7F0:	8D EB 03 A9 31 8D 04 D0 AA
C628:	C9 0F D0 45 AD ED 03 D0 86	C7F8:	AD 03 D0 8D 05 D0 AD 15 A0
C630:	3D AD EE 03 F0 38 A9 01 E0	C800:	D0 09 04 8D 15 D0 4C 3C D9
C638:	8D ED 03 AD 00 D0 8D 06 C8	C808:	C8 AD 04 D0 C9 10 D0 17 15
C640:	D0 AD 10 D0 29 01 C9 01 94	C810:	AD 10 D0 29 04 D0 10 A9 56
C648:	D0 0B AD 10 D0 09 08 8D 51	C818:	00 8D EB 03 AD 15 D0 29 51
C650:	10 D0 4C 5D C6 AD 10 D0 30	C820:	FB 8D 15 D0 4C 3C C8 CE AF
C658:	29 F7 8D 10 D0 AD 01 D0 67	C828:	04 D0 20 C0 CA AD 04 D0 2B
C660:	69 0E 8D 07 D0 18 AD 15 18	C830:	C9 FF D0 08 AD 10 D0 29 8A
C668:	D0 09 08 8D 15 D0 4C 00 0A	C838:	FB 8D 10 D0 60 AD ED 03 A1
C670:	C7 C9 17 D0 33 AD 00 D0 9B	C840:	F0 1A AD 07 D0 C9 EE F0 7A
C678:	C9 22 D0 0A AD 10 D0 29 F6	C848:	06 EE 07 D0 4C 5C C8 AD 34
C680:	01 F0 03 4C 00 C7 A9 50 83	C850:	15 D0 29 F7 8D 15 D0 A9 74
C688:	8D 08 D4 A9 73 8D 07 D4 79	C858:	00 8D ED 03 AC 47 03 A2 70
C690:	A9 21 8D 0B D4 EE 00 D0 88	C860:	50 CA D0 FD C0 10 D0 03 EE
C698:	AD 00 D0 D0 08 AD 10 D0 7E	C868:	20 D7 C7 88 D0 F1 AD 1E 3F
C6A0:	09 01 8D 10 D0 4C 00 C7 2D	C870:	D0 8D 4A 03 AD 4A 03 29 40
C6A8:	C9 1B D0 29 AD 00 D0 C9 CF	C878:	04 C9 04 D0 13 20 0D C3 1F
C6B0:	18 D0 0A AD 10 D0 29 01 5C	C880:	AD 02 04 C9 30 F0 06 CE F3
C6B8:	D0 03 4C 00 C7 20 90 CA 1C	C888:	02 04 4C 92 C5 4C 70 CA BA
C6C0:	CE 00 D0 AD 00 D0 C9 FF A8	C890:	AD EE 03 D0 41 AD 4A 03 3D
C6C8:	D0 08 AD 10 D0 29 FE 8D E5	C898:	29 01 C9 01 D0 38 A0 FF 37
C6D0:	10 D0 4C 00 C7 C9 1E D0 7E	C8A0:	A2 FF 8E 01 D4 8C 00 D4 09
C6D8:	13 AD 01 D0 C9 46 D0 03 4F	C8A8:	A9 21 8D 04 D4 8E 20 D0 59
C6E0:	4C 00 C7 20 A8 CA CE 01 58	C8B0:	A9 00 8D 04 D4 CA D0 EA 47
C6E8:	D0 4C 00 C7 C9 1D F0 03 A8	C8B8:	88 D0 E5 20 4A C2 A9 07 D5
C6F0:	4C 00 C7 AD 01 D0 C9 68 B6	C8C0:	8D 20 D0 AD FA 03 F0 2A 06
C6F8:	F0 F6 20 A8 CA EE 01 D0 35	C8C8:	A9 00 8D FA 03 8D 48 03 D6
C700:	AD EE 03 D0 10 AD 09 D0 08	C8D0:	8D 10 D0 4C 01 C4 AD 4A 49
C708:	C9 46 D0 03 4C 7D C8 CE 4D	C8D8:	03 29 18 C9 18 D0 10 AD 8D
C710:	09 D0 4C A5 C7 AD 1B D4 41	C8E0:	15 D0 29 F7 8D 15 D0 A9 05
C718:	29 31 F0 08 AD 61 03 D0 4E	C8E8:	00 8D EE 03 8D ED 03 4C 33
C720:	43 4C 39 C7 AD 61 03 F0 B3	C8F0:	12 C6 20 D8 CA A9 01 8D C5
C728:	08 A9 00 8D 61 03 4C 1C 34	C8F8:	15 D0 AD 47 03 8D 8B 03 F2
C730:	C7 A9 01 8D 61 03 4C 1C FC	C900:	A9 08 8D 77 03 20 E9 C1 85
C738:	C7 AD 08 D0 C9 18 D0 0F 48	C908:	A9 08 8D 27 D0 A9 FC 8D 73
C740:	AD 10 D0 29 10 C9 10 F0 D2	C910:	00 D0 A9 00 8D 10 D0 A9 A2
C748:	06 EE 08 D0 4C 61 C7 CE 5A	C918:	7F 8D 01 D0 A9 0B 8D 40 79

IMPORTANT! Letters on white background are **Bug Repellent** line codes. **Do not enter them!** Pages 119 and 120 explain these codes and provide other essential information on entering **Ahoy!** programs. Refer to these pages **before** entering any programs!

C920:	03	20	11	C2	A9	10	8D	FF	5E	CAD8:	AD	15	D0	8D	61	03	A9	00	08
C928:	03	A9	A0	8D	42	03	A9	22	14	CAE0:	8D	15	D0	A0	FF	A2	64	CA	C6
C930:	8D	43	03	20	AD	C2	A9	EC	2B	CAE8:	AD	1E	D0	AD	1F	D0	20	A8	EB
C938:	8D	42	03	A9	10	8D	FF	03	55	CAF0:	CA	E0	00	D0	F2	A9	00	8D	97
C940:	20	AD	C2	A9	20	8D	D4	05	02	CAF8:	0B	D4	20	90	CA	8C	21	D0	D2
C948:	8D	D5	05	8D	D6	05	8D	D7	7F	CB00:	88	C0	00	D0	E0	A9	00	8D	32
C950:	05	8D	FC	05	8D	FD	05	8D	03	CB08:	21	D0	AD	61	03	8D	15	D0	7F
C958:	FE	05	8D	FF	05	AD	1F	D0	8C	CB10:	60	AD	41	03	8D	49	03	20	5C
C960:	A9	00	8D	0B	D4	8D	04	D4	DD	CB18:	D8	CA	A9	01	8D	7E	03	20	95
C968:	20	C0	CA	18	AD	00	DC	29	DF	CB20:	E9	C1	A9	01	8D	40	03	20	67
C970:	1F	C9	1E	D0	10	AD	01	D0	D7	CB28:	11	C2	A9	08	8D	27	D0	A9	DC
C978:	C9	5E	F0	06	CE	01	D0	20	58	CB30:	01	8D	10	D0	A9	7F	8D	01	57
C980:	A8	CA	4C	96	C9	C9	1D	D0	58	CB38:	D0	A9	40	8D	00	D0	A9	01	FB
C988:	F9	AD	01	D0	C9	D2	F0	F2	82	CB40:	8D	15	D0	A9	AA	85	FB	A9	33
C990:	EE	01	D0	20	A8	CA	AD	1F	B1	CB48:	04	85	FC	A0	00	A2	0A	18	34
C998:	D0	29	01	C9	01	D0	1B	A9	F3	CB50:	A9	25	91	FB	A5	FB	69	28	DF
C9A0:	0B	8D	40	03	20	11	C2	20	90	CB58:	85	FB	A5	FC	69	00	85	FC	68
C9A8:	0D	C3	AD	02	04	C9	30	F0	18	CB60:	CA	D0	EC	AD	1F	D0	AD	7E	B2
C9B0:	06	CE	02	04	4C	F5	C8	4C	E2	CB68:	03	F0	0E	AD	00	DC	29	1F	3D
C9B8:	70	CA	A9	00	8D	40	03	20	8E	CB70:	C9	0F	D0	74	A9	00	8D	7E	44
C9C0:	11	C2	CE	77	03	AD	77	03	06	CB78:	03	AD	00	DC	29	1F	C9	1E	36
C9C8:	F0	0E	AC	47	03	A2	AA	CA	D6	CB80:	D0	0D	AD	01	D0	C9	46	F0	DE
C9D0:	D0	FD	88	D0	F8	4C	60	C9	68	CB88:	17	CE	01	D0	20	A8	CA	C9	9D
C9D8:	A9	08	8D	77	03	AD	E8	07	30	CB90:	1D	D0	0D	AD	01	D0	C9	E2	B7
C9E0:	8D	79	03	A9	E7	85	FB	A9	A7	CB98:	F0	06	EE	01	D0	20	A8	CA	E3
C9E8:	07	85	FC	A0	00	B1	FB	8D	4E	CBA0:	AD	10	D0	D0	15	AD	00	D0	93
C9F0:	7A	03	18	A5	FB	69	01	85	18	CBA8:	C9	18	D0	0E	CE	49	03	AD	32
C9F8:	FB	A5	FC	69	00	85	FC	AD	31	CBB0:	49	03	F0	03	4C	1F	CB	4C	74
CA00:	7A	03	91	FB	38	A5	FB	E9	CE	CBB8:	45	CA	CE	00	D0	20	90	CA	E3
CA08:	02	85	FB	A5	FC	E9	00	85	9D	CBC0:	AD	00	D0	C9	FF	D0	05	A9	88
CA10:	FC	A5	FB	C9	9F	D0	D6	A5	65	CBC8:	00	8D	10	D0	AD	1F	D0	29	FD
CA18:	FC	C9	04	D0	D0	AD	79	03	AE	CBD0:	01	C9	01	D0	13	20	0D	C3	71
CA20:	8D	A0	04	AD	1B	D4	29	01	1A	CBD8:	AD	02	04	C9	30	F0	06	CE	4C
CA28:	F0	03	4C	60	C9	A9	0B	8D	D4	CBE0:	02	04	4C	17	CB	4C	70	CA	9D
CA30:	40	03	20	11	C2	EE	8B	03	E4	CBE8:	AC	47	03	A2	50	CA	D0	FD	6C
CA38:	AD	8B	03	C9	40	F0	03	4C	BE	CBF0:	88	D0	F8	A9	00	8D	04	D4	53
CA40:	60	C9	4C	11	CB	AD	47	03	8B	CBF8:	8D	0B	D4	AD	1B	D4	29	03	30
CA48:	C9	19	F0	03	CE	47	03	AD	E5	CC00:	F0	03	4C	66	CB	AD	AA	04	CE
CA50:	41	03	C9	14	F0	03	EE	41	96	CC08:	8D	5C	03	A9	D2	85	FB	A9	9C
CA58:	03	A9	01	8D	FA	03	A9	00	3B	CC10:	04	85	FC	A0	00	B1	FB	8D	72
CA60:	8D	48	03	AD	02	04	C9	33	E9	CC18:	5D	03	38	A5	FB	E9	28	85	E9
CA68:	F0	03	EE	02	04	4C	10	C4	72	CC20:	FB	A5	FC	E9	00	85	FC	AD	D8
CA70:	20	E9	C1	A9	00	8D	15	D0	59	CC28:	5D	03	91	FB	18	A5	FB	69	39
CA78:	A9	03	8D	40	03	20	11	C2	E9	CC30:	50	85	FB	A5	FC	69	00	85	93
CA80:	A0	00	B9	E0	C1	99	C7	05	E3	CC38:	FC	A5	FB	C9	F2	D0	D6	A5	E0
CA88:	C8	C0	09	D0	F5	4C	51	C3	43	CC40:	FC	C9	07	D0	D0	AD	5C	03	BC
CA90:	A9	50	8D	08	D4	A9	73	8D	9F	CC48:	8D	CA	07	4C	66	CB	00	00	26
CA98:	07	D4	A9	00	8D	0C	D4	8D	1A										
CAA0:	00	D4	A9	21	8D	0B	D4	60	0E										
CAA8:	A9	36	8D	08	D4	A9	6F	8D	99										
CAB0:	07	D4	A9	00	8D	0C	D4	8D	32										
CAB8:	0D	D4	A9	11	8D	0B	D4	60	23										
CAC0:	A9	10	8D	01	D4	A9	6F	8D	84										
CAC8:	00	D4	A9	00	8D	05	D4	8D	3C										
CAD0:	06	D4	A9	21	8D	04	D4	60	3D										

128 RAM CHECK FROM PAGE 39

•10 REM *** 128 RAM CHECK *** BUCK CHILDR
 ESS ***
 •20 REM *** P.O. BOX 13575 SALEM, OR 9730

OI

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9 ***
•30 PRINTCHR$(147)"LOADING AND CHECKING DATA LINE.":J=4864:L=90
•40 PRINTCHR$(19)TAB(31)L:PRINT:FORB=0TO11:READA:IFA<0ORA>255THEN80
•50 POKEJ+B,A:X=X+A:NEXTB:READA:IFA<>XTHE N80
•60 X=0:J=J+12:L=L+10:IFL<461THEN40
•70 PRINT"THE DATA IS OK AND LOADED.":PRINT:PRINT"SYS 4864 TO ACTIVATE.":END
•80 PRINT"ERROR IN DATA LINE.":L:END
•90 DATA169,0,162,11,160,16,141,0,255,133,250,133,1430
•100 DATA254,134,251,132,252,32,125,255,147,0,162,5,1749
•110 DATA160,13,24,32,240,255,32,125,255,42,42,32,1252
•120 DATA66,65,78,75,32,48,32,42,42,13,17,67,577
•130 DATA72,69,67,75,73,78,71,32,67,65,83,83,835
•140 DATA69,84,84,69,32,66,85,70,70,69,82,44,824
•150 DATA13,73,78,80,85,84,47,79,85,84,80,85,873
•160 DATA84,32,66,85,70,70,69,82,83,44,32,65,782
•170 DATA78,68,13,83,80,82,73,84,69,32,68,69,799
•180 DATA70,73,78,73,84,73,79,78,32,65,82,69,856
•190 DATA65,32,32,0,56,32,240,255,134,65,132,66,1109
•200 DATA160,0,132,253,169,63,141,0,255,164,253,152,1742
•210 DATA141,99,4,166,254,240,29,162,250,142,185,2,1674
•220 DATA142,200,2,160,0,140,0,255,162,1,32,119,1213
•230 DATA255,162,1,32,122,255,240,12,208,87,144,200,1718
•240 DATA162,0,129,250,193,250,208,77,168,200,132,253,2022
•250 DATA208,198,140,0,255,166,65,164,66,24,32,240,1558
•260 DATA255,32,125,255,18,0,165,251,166,250,32,50,1599
•270 DATA142,230,250,208,171,230,251,165,251,197,252,144,2491
•280 DATA163,166,65,164,66,24,32,240,255,32,125,255,1587
•290 DATA42,42,42,32,79,75,32,42,42,42,13,0,483
•300 DATA165,252,201,255,144,58,165,254,240,58,96,144,2032
•310 DATA169,169,0,141,0,255,166,65,164,66,24,32,1251
•320 DATA240,255,32,125,255,42,32,69,82,8

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DC 2,79,82,1375
OG 2,125,255,1500
MB 2,125,255,1500
JF 2,125,255,17,1577
AN 2,29,336
PL 2,29,336
HL 2,29,336
NO 2,29,336
NK 2,29,336
JN 2,29,336
OC 2,29,336
KL 2,29,336
KH 2,29,336
MH 2,29,336
FP 2,29,336
OM 2,29,336
JL 2,29,336
OF 2,29,336
MF 2,29,336
IC 2,29,336
KM 2,29,336
PA 2,29,336
BE 2,29,336
KC 2,29,336
HO 2,29,336
JP 2,29,336
KC 2,29,336
ON 2,29,336
FO 2,29,336
AG 2,29,336

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GUARDIAN FROM PAGE 74

Starting address in hex: C000

Ending address in hex: CFFA

SYS to start: 49152

Flankspeed required for entry! See page 121.

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C000: A9 00 8D D8 02 8D D9 02 7B
C008: A9 03 8D D6 02 A9 0B 8D 5D
C010: 22 D0 A9 0C 8D 23 D0 A9 E3
C018: 0F 8D 24 D0 A9 05 8D D5 BB
C020: 02 78 A5 01 29 FB 85 01 EC
C028: A9 00 85 FB 85 FD A9 D0 51
C030: 85 FC A9 38 85 FE A2 08 C3
C038: A0 00 B1 FB 91 FD 88 D0 6F
C040: F9 E6 FC E6 FE CA D0 F0 90
C048: A5 01 09 04 85 01 58 20 FA
C050: CE C6 20 73 C7 20 81 C9 AC
C058: 20 4D CB AD 18 D0 09 0E 3F
C060: 8D 18 D0 A9 FF 8D 0F D4 F1
C068: A9 80 8D 12 D4 20 5A CA 4C
C070: A9 92 20 D2 FF A2 00 A0 E2
C078: 07 8C 86 02 18 20 F0 FF BD
C080: AD D9 02 AE D8 02 20 CD 81
C088: BD A9 30 20 D2 FF AD D6 97
C090: 02 38 C9 03 B0 0F 48 A2 42
C098: 00 A0 25 18 20 F0 FF A9 31
C0A0: 20 20 D2 FF 68 38 C9 02 20

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C0A8:	B0	0F	48	A2	00	A0	24	18	30	C278:	8D	B1	02	AD	00	D0	38	C9	3A
C0B0:	20	F0	FF	A9	20	20	D2	FF	7E	C280:	7A	90	0A	38	C9	CC	B0	0A	1F
C0B8:	68	38	C9	01	B0	0D	A2	00	84	C288:	A9	00	4C	97	C2	A9	01	4C	CF
C0C0:	A0	23	18	20	F0	FF	A9	20	77	C290:	97	C2	A9	FF	4C	97	C2	8D	C8
C0C8:	20	D2	FF	AD	11	D0	10	FB	57	C298:	B3	02	8A	09	10	AA	8A	C9	F0
C0D0:	AD	1E	D0	29	3F	8D	C8	02	2E	C2A0:	7B	D0	10	AD	00	D0	C9	50	95
C0D8:	20	3D	C2	CE	C3	02	D0	09	67	C2A8:	F0	06	CE	00	D0	CE	08	D0	E6
C0E0:	20	3F	C3	AD	D5	02	8D	C3	DA	C2B0:	4C	E6	C2	C9	77	D0	10	AD	76
C0E8:	02	AD	B9	02	D0	77	A9	0A	50	C2B8:	00	D0	C9	FA	F0	06	EE	00	34
C0F0:	CD	BB	02	D0	32	A9	04	8D	BA	C2C0:	D0	EE	08	D0	4C	E6	C2	C9	19
C0F8:	2D	D0	A9	DD	8D	FE	07	A9	BB	C2C8:	7E	D0	0D	AD	01	D0	C9	D7	46
C100:	E6	85	A2	A5	A2	D0	FC	A2	C7	C2D0:	F0	03	EE	01	D0	4C	E6	C2	7B
C108:	07	20	7F	C5	A9	80	0D	15	C0	C2D8:	C9	7D	D0	0A	AD	01	D0	C9	44
C110:	D0	8D	15	D0	20	7F	C5	A2	5C	C2E0:	AA	F0	03	CE	01	D0	AD	AE	7C
C118:	07	20	7F	C5	A9	00	8D	15	D0	C2E8:	02	F0	03	20	EF	C2	60	CE	E0
C120:	D0	20	48	C6	4C	00	C0	AE	DB	C2F0:	B1	02	D0	4A	A9	02	8D	B1	AA
C128:	BA	02	A0	10	18	20	F0	FF	BE	C2F8:	02	AD	03	D0	48	38	C9	8C	53
C130:	A0	FF	C8	98	48	0A	AA	E8	18	C300:	B0	0D	A9	FD	2D	17	D0	8D	08
C138:	BD	B9	C8	A8	CA	BD	B9	C8	2C	C308:	17	D0	A9	01	8D	B2	02	68	45
C140:	20	1E	AB	A9	58	A0	C8	20	B5	C310:	38	ED	B2	02	8D	03	D0	38	84
C148:	1E	AB	68	A8	CC	BB	02	D0	7E	C318:	C9	64	90	0D	AD	02	D0	18	7C
C150:	E1	A9	10	8D	B9	02	A9	09	E7	C320:	6D	B3	02	8D	02	D0	38	B0	8C
C158:	CD	BB	02	D0	08	A9	C0	0D	34	C328:	15	A9	FD	2D	15	D0	8D	15	9A
C160:	1B	D0	8D	1B	D0	AD	C8	02	3E	C330:	D0	A9	00	8D	AE	02	A9	FD	90
C168:	C9	09	F0	08	C9	0D	F0	04	FF	C338:	2D	10	D0	8D	10	D0	60	AD	C2
C170:	C9	39	D0	1D	AD	C5	02	C9	A0	C340:	15	D0	29	28	F0	03	4C	BF	77
C178:	05	D0	16	A2	00	20	7F	C5	6C	C348:	C3	A9	08	0D	1B	D0	8D	1B	5F
C180:	CE	D6	02	D0	06	20	57	C6	3D	C350:	D0	A9	0A	8D	C4	02	A9	00	D2
C188:	4C	00	C0	20	8F	CA	4C	70	CC	C358:	8D	2A	D0	8D	C5	02	8D	C6	8A
C190:	C0	AD	C8	02	C9	05	D0	03	6C	C360:	02	A9	DE	8D	FB	07	AD	1B	44
C198:	4C	7B	C1	AD	C8	02	C9	2B	8F	C368:	D4	29	03	AA	BD	D9	C8	8D	02
C1A0:	F0	08	C9	0A	F0	04	C9	3B	67	C370:	FD	07	8E	C2	02	BD	D5	C8	25
C1A8:	D0	5C	AD	C1	02	30	57	AD	7C	C378:	8D	2C	D0	A9	FF	8D	C1	02	FD
C1B0:	01	D0	38	E9	AA	8D	CB	02	AA	C380:	A9	8A	8D	07	D0	8D	0B	D0	83
C1B8:	AD	C7	02	38	CD	CB	02	B0	B4	C388:	A9	A0	8D	06	D0	A9	AB	8D	1A
C1C0:	45	AD	C7	02	18	69	0F	38	46	C390:	0A	D0	A9	DF	2D	17	D0	8D	97
C1C8:	CD	CB	02	90	39	A9	FD	2D	03	C398:	17	D0	A9	DF	2D	1D	D0	8D	B2
C1D0:	15	D0	8D	15	D0	A2	03	20	EF	C3A0:	1D	D0	A9	08	0D	17	D0	8D	C2
C1D8:	7F	C5	A9	D3	2D	15	D0	8D	3C	C3A8:	17	D0	A9	08	0D	1D	D0	8D	CA
C1E0:	15	D0	A9	00	8D	AE	02	20	CE	C3B0:	1D	D0	A9	00	8D	C0	02	A9	42
C1E8:	D4	CA	AC	C2	02	C8	A9	32	9E	C3B8:	28	0D	15	D0	8D	15	D0	A2	E9
C1F0:	A2	00	18	6D	D8	02	8D	D8	5A	C3C0:	06	A0	0A	AD	C1	02	10	06	F8
C1F8:	02	8A	6D	D9	02	8D	D9	02	38	C3C8:	98	48	8A	A8	68	AA	BD	00	AD
C200:	88	D0	EB	4C	70	C0	AD	BB	2C	C3D0:	D0	18	6D	C0	02	9D	00	D0	58
C208:	02	C9	09	D0	2D	AD	02	D0	5B	C3D8:	E8	BD	00	D0	18	6D	C1	02	99
C210:	38	C9	A6	90	25	38	C9	B2	23	C3E0:	9D	00	D0	AD	C1	02	10	03	D3
C218:	B0	20	AD	03	D0	38	C9	82	EE	C3E8:	4C	A8	C4	B9	00	D0	18	6D	B2
C220:	90	18	38	C9	8A	B0	13	A9	C2	C3F0:	C0	02	99	00	D0	C8	B9	00	A0
C228:	02	0D	1D	D0	8D	1D	D0	A2	43	C3F8:	D0	18	6D	C1	02	99	00	D0	7D
C230:	01	20	7F	C5	20	12	C6	4C	DB	C400:	CE	C4	02	F0	03	4C	1D	C5	B8
C238:	21	C0	4C	CB	C0	AD	00	DC	7D	C408:	A9	14	8D	C4	02	AE	C5	02	90
C240:	AA	29	10	D0	59	AD	AE	02	AC	C410:	E0	05	F0	F1	EE	C5	02	AD	3D
C248:	D0	54	A9	01	8D	AE	02	AD	04	C418:	C5	02	0A	0A	18	6D	C5	02	41
C250:	00	D0	18	69	0C	8D	02	D0	0F	C420:	AA	AD	C6	02	D0	27	BD	DD	D4
C258:	AD	01	D0	38	E9	0F	8D	03	99	C428:	C8	8D	C6	02	F0	1F	AD	06	0B
C260:	D0	A9	02	0D	17	D0	8D	17	76	C430:	D0	18	69	09	8D	04	D0	AD	9B
C268:	D0	A9	02	0D	15	D0	8D	15	7A	C438:	07	D0	18	69	0B	8D	05	D0	FF
C270:	D0	A9	02	8D	B2	02	A9	02	DA	C440:	A9	00	8D	29	D0	A9	04	0D	2C

C448:	15	D0	8D	15	D0	E8	A9	D7	0C	C618:	AF	02	8D	15	D0	A2	03	A0	83
C450:	2D	1D	D0	1D	DD	C8	8D	1D	D9	C620:	05	18	20	F0	FF	A9	11	A0	A9
C458:	D0	A9	D7	2D	17	D0	1D	DD	BA	C628:	C8	20	1E	AB	A9	32	85	A2	DE
C460:	C8	8D	17	D0	E8	BD	DD	C8	EB	C630:	A5	A2	D0	FC	EE	22	D0	EE	17
C468:	18	6D	06	D0	8D	06	D0	BD	E6	C638:	23	D0	EE	24	D0	AD	D5	02	95
C470:	DD	C8	18	6D	07	D0	8D	07	09	C640:	C9	01	F0	03	CE	D5	02	60	06
C478:	D0	BD	DD	C8	18	6D	0A	D0	0E	C648:	A2	03	A0	05	18	20	F0	FF	BC
C480:	8D	0A	D0	BD	DD	C8	18	6D	D2	C650:	A9	EE	A0	C7	20	1E	AB	A2	DD
C488:	0B	D0	8D	0B	D0	E8	AC	C2	26	C658:	05	A0	05	18	20	F0	FF	A9	D5
C490:	02	B9	D9	C8	18	7D	DD	C8	2B	C660:	34	A0	C8	20	1E	AB	AD	00	95
C498:	8D	FB	07	E8	A9	DB	18	7D	2D	C668:	DC	C9	7F	D0	F9	AD	00	DC	E3
C4A0:	DD	C8	8D	FD	07	4C	1D	C5	09	C670:	C9	7F	F0	F9	60	A2	18	A9	69
C4A8:	AD	0B	D0	38	C9	78	B0	6D	CA	C678:	00	9D	00	D4	CA	10	FA	A9	6A
C4B0:	A9	D7	2D	17	D0	8D	17	D0	BC	C680:	F0	8D	06	D4	A9	11	8D	04	26
C4B8:	A9	D7	2D	1D	D0	8D	1D	D0	D0	C688:	D4	A9	0F	8D	18	D4	60	AE	9F
C4C0:	A9	01	8D	C1	02	AE	C2	02	30	C690:	B5	02	BD	7F	C9	8D	B6	02	95
C4C8:	BD	D5	C8	8D	2A	D0	A9	00	57	C698:	8A	0A	AA	BD	7B	C9	85	02	62
C4D0:	8D	2C	D0	AE	0A	D0	8E	06	79	C6A0:	E8	BD	7B	C9	85	03	CE	AF	93
C4D8:	D0	AD	C2	02	C9	02	F0	1C	F4	C6A8:	02	D0	22	A9	10	8D	AF	02	96
C4E0:	C9	03	F0	18	AD	1B	D4	29	7D	C6B0:	AC	B0	02	38	CC	B6	02	90	5E
C4E8:	1F	8D	C7	02	AD	0B	D0	38	21	C6B8:	05	A0	00	8E	B0	02	B1	02	53
C4F0:	E9	1F	18	6D	C7	02	8D	07	DD	C6C0:	8D	01	D4	C8	B1	02	8D	00	2E
C4F8:	D0	4C	0A	C5	AD	0B	D0	38	A7	C6C8:	D4	C8	8C	B0	02	60	A9	F4	A4
C500:	E9	05	8D	07	D0	A9	05	8D	90	C6D0:	8D	14	03	A9	C6	8D	15	03	8B
C508:	C7	02	AD	FD	07	8D	FB	07	15	C6D8:	A9	01	8D	12	D0	AD	11	D0	83
C510:	A9	DB	8D	FD	07	A9	F7	2D	F6	C6E0:	29	7F	8D	11	D0	A9	81	8D	B1
C518:	1B	D0	8D	1B	D0	AD	C5	02	F2	C6E8:	1A	D0	20	75	C6	A9	00	8D	67
C520:	38	C9	01	90	20	AD	06	D0	58	C6F0:	B9	02	58	60	AD	19	D0	8D	8A
C528:	38	CD	00	D0	F0	12	90	08	9A	C6F8:	19	D0	29	01	D0	07	AD	0D	9F
C530:	A9	FF	8D	C0	02	4C	45	C5	81	C700:	DC	58	4C	31	EA	AD	12	D0	2E
C538:	A9	01	8D	C0	02	4C	45	C5	8A	C708:	38	C9	3A	B0	0A	A9	02	8D	38
C540:	A9	00	8D	C0	02	AD	0B	D0	C3	C710:	21	D0	A9	3A	4C	1E	C7	A9	C1
C548:	C9	08	D0	08	A9	D7	2D	15	B6	C718:	00	8D	21	D0	A9	01	8D	12	E1
C550:	D0	8D	15	D0	AD	C6	02	F0	FB	C720:	D0	20	8F	C6	CE	AD	02	D0	B6
C558:	25	EE	05	D0	EE	05	D0	AD	B4	C728:	47	AD	22	D0	AC	23	D0	AE	5F
C560:	04	D0	18	6D	C0	02	8D	04	0F	C730:	24	D0	8D	23	D0	8C	24	D0	28
C568:	D0	AD	05	D0	8D	29	D0	30	74	C738:	8E	22	D0	A9	0C	8D	AD	02	AC
C570:	0D	A9	FB	2D	15	D0	8D	15	D8	C740:	CE	B4	02	D0	2B	A9	0A	8D	03
C578:	D0	A9	00	8D	C6	02	60	A9	53	C748:	B4	02	EE	0E	D0	AD	0C	D0	57
C580:	80	8D	0B	D4	A9	D8	9D	F8	87	C750:	38	E9	01	8D	0C	D0	B0	08	96
C588:	07	BD	B8	C7	0D	1C	D0	8D	55	C758:	A9	BF	2D	10	D0	8D	10	D0	3E
C590:	1C	D0	A9	0F	8D	08	D4	A9	4A	C760:	AD	B9	02	F0	0B	CE	B9	02	50
C598:	0F	8D	07	D4	A9	F0	8D	0D	46	C768:	D0	06	CE	BA	02	EE	BB	02	77
C5A0:	D4	A9	00	8D	0C	D4	A9	81	B8	C770:	4C	BC	FE	A9	B9	85	FB	A9	07
C5A8:	8D	0B	D4	A9	0F	8D	A7	02	06	C778:	CF	85	FC	A0	00	B1	FB	F0	0A
C5B0:	8E	A8	02	20	97	E0	A5	8E	B6	C780:	36	A2	00	18	0A	48	8A	2A	78
C5B8:	AE	A8	02	9D	27	D0	A9	FF	51	C788:	AA	68	0A	48	8A	2A	AA	68	B5
C5C0:	85	A2	A5	A2	D0	FC	BD	27	E3	C790:	0A	48	8A	2A	AA	68	85	FD	2E
C5C8:	D0	8D	26	D0	A9	FE	85	A2	EE	C798:	C6	FD	8A	18	69	38	85	FE	26
C5D0:	A5	A2	D0	FC	BD	27	D0	8D	2A	C7A0:	A0	08	B1	FB	91	FD	88	D0	DF
C5D8:	25	D0	A9	FD	85	A2	A5	A2	E6	C7A8:	F9	A5	FB	18	69	09	85	FB	50
C5E0:	D0	FC	AE	A8	02	AC	A7	02	5E	C7B0:	90	02	E6	FC	4C	7B	C7	60	17
C5E8:	88	8C	A7	02	8C	07	D4	8C	9C	C7B8:	01	02	04	08	10	20	40	80	B8
C5F0:	0C	D4	D0	BF	A9	FF	38	FD	42	C7C0:	8E	08	92	90	20	53	43	4F	80
C5F8:	B8	C7	2D	15	D0	8D	15	D0	FF	C7C8:	52	45	3A	20	20	20	20	20	3B
C600:	A9	80	8D	0B	D4	A9	FF	38	79	C7D0:	20	20	20	12	20	47	55	41	41
C608:	FD	B8	C7	2D	1C	D0	8D	1C	4A	C7D8:	52	44	49	41	4E	20	92	20	1B
C610:	D0	60	A9	01	8D	B5	02	8D	BE	C7E0:	20	20	20	53	48	49	50	53	C9

C7E8:	3A	2A	2A	2A	20	00	12	90	64	C9B8:	A9	58	20	1C	CA	C6	FD	E6	6D
C7F0:	20	54	48	45	20	45	41	52	EB	C9C0:	FE	EE	A9	02	A9	98	20	1C	D8
C7F8:	54	48	20	48	41	53	20	42	F4	C9C8:	CA	C6	FD	E6	FE	EE	A9	02	D8
C800:	45	45	4E	20	44	45	53	54	2A	C9D0:	A9	D8	20	1C	CA	C6	FD	E6	06
C808:	52	4F	59	45	44	20	21	20	ED	C9D8:	FE	EE	A9	02	CE	A7	02	F0	DB
C810:	00	12	90	59	4F	55	20	48	19	C9E0:	03	4C	B8	C9	A2	00	A0	18	0E
C818:	41	56	45	20	53	41	56	45	45	C9E8:	A9	98	20	EC	CA	A2	00	A0	46
C820:	44	20	54	48	45	20	50	4C	23	C9F0:	00	18	20	F0	FF	A9	C0	A0	25
C828:	41	4E	45	54	20	45	41	52	4A	C9F8:	C7	20	1E	AB	A2	4B	8A	48	6B
C830:	54	48	21	00	12	90	50	52	33	CA00:	20	97	E0	A4	8E	68	AA	A9	88
C838:	45	53	53	20	46	49	52	45	6B	CA08:	2E	99	28	04	98	99	28	D8	2F
C840:	20	42	55	54	54	4F	4E	20	5E	CA10:	CA	D0	EB	AD	11	D0	09	10	40
C848:	54	4F	20	50	4C	41	59	20	63	CA18:	8D	11	D0	60	AC	A9	02	A2	E2
C850:	41	47	41	49	4E	21	92	00	65	CA20:	00	20	EC	CA	E8	E4	FD	D0	94
C858:	11	9D	9D	9D	9D	9D	9D	9D	B8	CA28:	F8	48	A9	04	8D	A8	02	68	B7
C860:	9D	9D	00	1E	92	20	20	20	AC	CA30:	20	EC	CA	C8	CE	A8	02	D0	1B
C868:	20	20	20	20	20	20	00	20	49	CA38:	F7	20	EC	CA	E8	E4	FE	D0	A5
C870:	20	20	20	25	20	20	20	20	76	CA40:	F8	48	A9	04	8D	A8	02	68	CF
C878:	00	20	20	20	3C	23	3E	20	96	CA48:	20	EC	CA	88	CE	A8	02	D0	F2
C880:	20	20	00	20	20	3C	23	23	83	CA50:	F7	20	EC	CA	E8	E0	28	D0	E2
C888:	23	3E	20	20	00	20	3C	23	A9	CA58:	F8	60	A2	14	A9	00	9D	A7	57
C890:	23	23	23	23	3E	20	00	3C	B7	CA60:	02	9D	C0	02	CA	10	F7	A9	3F
C898:	23	23	23	23	23	23	23	3E	CC	CA68:	0C	8D	BA	02	8D	C3	02	8D	9F
C8A0:	00	23	23	23	23	23	23	23	96	CA70:	B4	02	8D	B9	02	8D	AF	02	AF
C8A8:	23	23	00	23	23	23	23	12	8D	CA78:	A9	46	8D	0D	D0	8D	0F	D0	41
C8B0:	90	25	1E	92	23	23	23	23	A3	CA80:	A9	50	8D	0C	D0	A9	05	8D	21
C8B8:	00	63	C8	6F	C8	79	C8	83	E2	CA88:	0E	D0	A9	40	8D	10	D0	A9	69
C8C0:	C8	8D	C8	97	C8	A1	C8	A1	4C	CA90:	11	8D	1D	D0	A9	D1	8D	15	3B
C8C8:	C8	A1	C8	AB	C8	CF	D9	DF	F9	CA98:	D0	A9	01	8D	27	D0	8D	28	4F
C8D0:	D0	DA	DB	D6	D7	01	03	0D	18	CAA0:	D0	8D	2A	D0	A9	00	8D	2B	5C
C8D8:	08	D0	D0	D3	D3	00	00	00	2A	CAA8:	D0	8D	2C	D0	8D	2D	D0	8D	1D
C8E0:	00	00	00	00	00	01	00	01	E2	CAB0:	17	D0	A2	07	BD	CD	C8	9D	34
C8E8:	00	00	02	01	00	28	F4	01	0A	CAB8:	F8	07	CA	10	F7	A9	84	8D	47
C8F0:	00	01	28	00	02	01	00	28	45	CAC0:	1C	D0	A9	D2	8D	01	D0	A9	33
C8F8:	00	02	01	04	30	04	FB	04	34	CAC8:	E6	8D	09	D0	A9	A0	8D	00	EE
C900:	30	04	FB	00	00	04	B4	00	E8	CAD0:	D0	8D	08	D0	A9	06	8D	26	6B
C908:	00	04	B4	00	00	04	B4	04	7D	CAD8:	D0	8D	25	D0	A9	05	8D	2E	97
C910:	70	04	FB	04	70	00	00	04	F8	CAE0:	D0	AD	11	D0	10	FB	AD	1E	19
C918:	B4	00	00	04	30	04	B4	04	BD	CAE8:	D0	D0	F6	60	8D	AA	02	8E	AA
C920:	70	04	FB	04	70	04	B4	04	C1	CAF0:	AB	02	8C	AC	02	48	8A	48	F4
C928:	B4	05	98	05	ED	05	98	00	0B	CAF8:	98	A2	00	0A	48	8A	2A	AA	E5
C930:	00	05	98	05	ED	00	00	04	C4	CB00:	68	0A	48	8A	2A	AA	68	0A	8C
C938:	30	04	B4	04	30	04	70	04	CD	CB08:	48	8A	2A	AA	68	0A	48	8A	F4
C940:	FB	04	30	05	98	05	ED	00	01	CB10:	2A	AA	68	0A	48	8A	2A	AA	FE
C948:	00	05	ED	00	00	00	00	05	40	CB18:	68	85	FB	86	FC	98	A2	00	C0
C950:	ED	05	98	00	00	1C	31	1C	45	CB20:	0A	48	8A	2A	AA	68	0A	48	8C
C958:	31	1C	31	1D	DF	12	D1	13	CA	CB28:	8A	2A	AA	68	0A	48	8A	2A	F6
C960:	EF	16	60	16	60	16	60	16	C9	CB30:	AA	68	18	65	FB	85	FB	8A	C8
C968:	60	1C	31	1C	31	1C	31	1D	CD	CB38:	65	FC	69	04	85	FC	68	A8	9B
C970:	DF	12	D1	13	EF	16	60	16	C3	CB40:	68	91	FB	AD	AA	02	AE	AB	EA
C978:	60	00	00	FB	C8	55	C9	5A	17	CB48:	02	AC	AC	02	60	A9	33	85	68
C980:	26	AD	11	D0	29	EF	8D	11	ED	CB50:	FC	A9	C0	85	FB	A9	79	85	E1
C988:	D0	A9	90	20	D2	FF	A9	93	C3	CB58:	FD	A9	CB	85	FE	A2	04	A0	97
C990:	20	D2	FF	A9	00	8C	21	D0	AB	CB60:	00	B1	FD	91	FB	88	D0	F9	F0
C998:	8D	15	D0	8D	20	D0	AD	11	49	CB68:	E6	FC	E6	FE	CA	D0	F0	A0	5F
C9A0:	D0	09	40	8D	11	D0	A9	0F	E2	CB70:	40	B1	FD	91	FB	88	10	F9	80
C9A8:	85	FD	A9	19	85	FE	A9	05	22	CB78:	60	00	00	00	00	00	00	00	D8
C9B0:	8D	A7	02	A9	09	8D	A9	02	D3	CB80:	00	00	00	00	00	00	00	00	80

CB88:	01	00	80	02	00	40	04	00	50	CD58:	FF	FC	3F	FF	FC	3F	FF	FC	CD
CB90:	20	0F	3C	F0	1D	7E	B8	3A	7B	CD60:	1F	FF	F8	1F	FF	F8	0F	FF	9F
CB98:	FF	5C	75	E7	AE	EB	FF	D7	C4	CD68:	F0	07	FF	E0	03	FF	C0	00	05
CBA0:	9F	E7	F9	9E	7E	79	FE	66	1E	CD70:	FF	00	00	00	00	00	00	00	70
CBA8:	7F	06	66	60	07	FF	E0	00	DC	CD78:	00	00	00	00	00	FF	00	03	7B
CBB0:	81	00	00	99	00	00	FF	00	CB	CD80:	EA	C0	0F	BA	A0	3E	EA	B0	70
CBB8:	00	00	00	00	00	00	00	00	B8	CD88:	3E	AA	A8	3F	EA	EC	2F	EB	4C
CBC0:	00	00	00	00	00	00	00	00	C0	CD90:	EC	2B	BF	EC	2A	AE	BC	2B	16
CBC8:	00	00	00	00	00	00	00	00	C8	CD98:	EA	FC	2A	AF	BC	3A	EE	EC	2D
CBD0:	00	00	38	00	00	6C	00	00	75	CDA0:	3A	BA	A8	3E	BB	A8	0F	FA	EA
CBD8:	92	00	00	82	00	00	00	00	ED	CDA8:	B0	0F	AE	A0	03	AA	C0	00	26
CBE0:	00	00	00	00	00	00	00	00	E0	CDB0:	FF	00	00	00	00	00	00	00	B0
CBE8:	00	00	00	00	00	00	00	00	E8	CDB8:	00	00	40	00	00	01	04	11	0F
CBF0:	00	00	00	00	00	00	00	00	F0	CDC0:	20	00	00	08	11	00	80	80	FA
CBF8:	00	00	00	00	00	00	00	00	F8	CDC8:	04	22	00	42	0C	84	00	C3	85
CC00:	00	00	00	00	00	00	00	00	00	CDD0:	00	12	0C	80	00	C3	21	08	5C
CC08:	00	00	00	00	00	00	00	00	7C	CDD8:	30	80	42	CF	00	00	30	84	50
CC10:	00	00	C6	00	01	FF	00	03	DA	CDE0:	04	8C	00	02	32	01	10	00	B6
CC18:	55	80	06	FE	C0	09	55	20	32	CDE8:	10	01	21	00	40	00	01	04	60
CC20:	0A	38	A0	0C	00	60	08	00	77	CDF0:	10	40	00	00	00	00	41	00	82
CC28:	20	00	00	00	00	00	00	00	48	CDF8:	00	00	00	00	00	00	00	00	F8
CC30:	00	00	00	00	00	00	00	00	30	CE00:	00	00	00	00	00	00	00	00	00
CC38:	00	00	00	00	00	00	00	00	38	CE08:	00	00	00	00	00	00	00	00	08
CC40:	00	00	00	00	00	00	00	00	40	CE10:	00	00	08	00	00	08	00	00	20
CC48:	01	FF	80	03	42	C0	06	BD	93	CE18:	08	00	00	08	00	00	00	00	28
CC50:	60	0D	5A	B0	1A	99	58	37	0C	CE20:	00	00	00	00	00	00	00	00	20
CC58:	FF	EC	6E	99	76	DC	5A	3B	36	CE28:	00	00	00	00	00	00	00	00	28
CC60:	D8	3C	1B	E0	00	07	C0	00	39	CE30:	00	00	00	00	00	00	00	00	30
CC68:	03	C0	00	03	00	00	00	00	2F	CE38:	FF	00	00	00	00	00	00	00	38
CC70:	00	00	00	00	00	00	00	00	70	CE40:	00	00	00	00	00	00	00	00	40
CC78:	00	00	00	00	00	00	00	00	78	CE48:	00	00	00	01	00	80	02	00	CB
CC80:	00	00	00	00	00	00	00	00	80	CE50:	40	04	00	20	0F	3C	F0	1F	10
CC88:	00	00	00	00	28	00	00	BA	6B	CE58:	FF	F8	3F	FF	FC	7F	FF	FE	0C
CC90:	00	00	54	00	00	38	00	00	1D	CE60:	FF	FF	FF	FF	FF	FF	FF	FF	60
CC98:	28	00	00	10	00	00	38	00	09	CE68:	FF	FF	FF	FF	07	FF	E0	07	57
CCA0:	00	7C	00	00	00	00	00	00	1D	CE70:	FF	E0	00	00	00	00	00	00	51
CCA8:	00	00	00	00	00	00	00	00	A8	CE78:	00	00	00	00	00	00	00	00	78
CCB0:	00	00	00	00	00	00	00	00	B0	CE80:	00	00	00	00	00	00	00	00	80
CCB8:	00	00	00	00	00	00	00	00	B8	CE88:	00	00	00	00	00	00	00	00	88
CCC0:	00	00	00	00	00	00	24	00	E4	CE90:	00	00	00	00	00	00	00	00	90
CCC8:	00	5A	00	00	7E	00	01	3C	DE	CE98:	00	00	00	00	00	00	00	00	98
CCD0:	80	03	18	C0	00	99	00	00	C6	CEA0:	00	00	00	00	00	00	00	00	A0
CCD8:	7E	00	00	24	00	00	3C	00	B7	CEA8:	00	00	00	00	00	00	00	00	A8
CCE0:	00	18	00	00	18	00	00	3C	4D	CEB0:	00	00	07	FF	C0	00	7C	00	F4
CCE8:	00	00	FF	00	00	00	00	00	E8	CEB8:	00	00	00	00	00	00	00	00	B8
CCF0:	00	00	00	00	00	00	00	00	F0	CEC0:	00	00	00	00	00	00	00	00	C0
CCF8:	00	00	22	00	00	7F	00	00	9A	CEC8:	00	00	00	00	00	00	00	00	C8
CD00:	C9	80	00	FF	80	04	7F	10	5E	CED0:	00	00	00	00	00	00	00	00	D0
CD08:	12	3E	24	0E	1C	38	03	1C	FD	CED8:	00	00	00	00	00	00	00	00	D8
CD10:	60	01	FF	C0	00	FF	80	00	B2	CEE0:	00	00	00	00	00	00	00	00	E0
CD18:	41	00	00	7F	00	00	7F	00	58	CEE8:	00	00	00	00	3F	FF	FC	FF	25
CD20:	00	7F	00	00	1C	00	00	1C	D7	CEF0:	FF	FF	3F	FF	FC	00	FF	00	2D
CD28:	00	00	1C	00	00	3E	00	00	82	CEF8:	00	00	18	00	00	FF	00	03	14
CD30:	7F	00	00	FF	80	07	FF	F0	28	CF00:	00	C0	06	00	60	08	00	10	3F
CD38:	00	00	00	00	00	FF	00	03	3B	CF08:	10	81	08	10	00	08	20	24	FD
CD40:	FF	C0	07	FF	E0	0F	FF	F0	E8	CF10:	04	20	18	04	E2	BD	47	E0	19
CD48:	1F	FF	F8	1F	FF	F8	3F	FF	B7	CF18:	18	07	20	24	04	20	00	04	A3
CD50:	FC	3F	FF	FC	3F	FF	FC	3F	05	CF20:	10	81	08	10	00	08	0A	00	DB

IMPORTANT! Letters on white background are **Bug Repellent** line codes. Do not enter them! Pages 119 and 120 explain these codes and provide other essential information on entering **Ahoy!** programs. Refer to these pages **before** entering any programs!

CF28:	50	04	00	20	03	00	C0	00	60	210	PD
CF30:	FF	00	00	18	00	00	18	00	60	•150 DATA255,173,141,2,208,251,173,188,192,76	EF
CF38:	00	FF	FF	FF	FF	FF	FF	FF	38	•160 DATA26,167,68,69,76,85,88,69,32,76	NK
CF40:	FF	FF	FF	FF	FF	FF	FF	FF	40	•170 DATA73,83,84,32,18,65,67,84,73,86	BK
CF48:	FF	FF	FF	FF	FF	FF	FF	FF	48	•180 DATA65,84,69,68,146,45,68,79,32,78	OG
CF50:	FF	00	00	00	00	00	00	00	50	•190 DATA79,84,32,69,68,73,84,32,76,73	KD
CF58:	00	00	00	00	00	00	00	00	58	•200 DATA78,69,83,13,0,68,69,76,85,88	IN
CF60:	00	00	00	00	00	00	00	00	60	•210 DATA69,32,76,73,83,84,32,18,68,73	JJ
CF68:	00	00	00	00	00	00	00	00	68	•220 DATA83,65,66,76,69,68,146,45,89,79	PD
CF70:	00	00	00	00	00	00	00	00	70	•230 DATA85,32,77,65,89,32,69,68,73,84	DP
CF78:	00	00	00	00	00	00	00	00	78	•240 DATA32,76,73,78,69,83,13,0,0,0	AD
CF80:	00	00	00	00	00	00	00	00	80	•250 DATA0	LH
CF88:	00	00	00	00	00	00	00	10	98		
CF90:	00	00	64	00	01	A9	00	00	9F		
CF98:	64	00	00	10	00	00	00	00	0D		
CFA0:	00	00	00	00	00	00	00	00	A0		
CFA8:	00	00	00	00	00	00	00	00	A8	•10 FOR ADD=828T01018:READN:CK=CK+N:POKEA	DD
CFB0:	00	00	00	00	00	00	00	00	B0	DD,N:NEXT	DD
CFB8:	FF	23	18	40	16	00	B2	00	FC	•20 IF CK<>17851 THEN PRINT"ERROR IN DATA	MA
CFC0:	4C	01	25	3C	42	81	91	91	56	STATEMENTS[3"."]:STOP	MA
CFC8:	81	42	3C	2A	38	38	7C	EE	CE	•30 PRINT"'SYS828' TO TOGGLE DELUXE LIST"	OK
CFD0:	EE	EE	FE	C6	18	FF	00	FF	8C	•40 SYS828	EF
CFD8:	00	FF	00	FF	00	2E	00	00	07	•50 END	IC
CFE0:	00	08	00	00	00	00	3C	01	26	•60 DATA173,249,3,73,255,141,249,3,208,18	NL
CFE8:	02	06	0B	18	26	69	9A	3E	7C	•70 DATA169,26,141,6,3,169,167,141,7,3	DF
CFF0:	80	40	60	D0	18	64	96	59	4F	•80 DATA169,205,160,3,32,30,171,96,169,11	FK
CFF8:	00	00	00	F8						1	GO
										•90 DATA141,6,3,169,3,141,7,3,169,162	GO
										•100 DATA160,3,32,30,171,169,0,141,250,3	JN
										•110 DATA96,141,248,3,201,34,208,8,173,25	BD
										0	HB
										•120 DATA3,73,255,141,250,3,173,248,3,201	HB
										•130 DATA58,208,18,173,250,3,208,13,169,1	IK
										3	IK
										•140 DATA32,210,255,169,32,32,210,255,32,	PD
										210	PD
										•150 DATA255,173,141,2,208,251,173,248,3,	JK
										76	JK
										•160 DATA26,167,68,69,76,85,88,69,32,76	NK
										•170 DATA73,83,84,32,18,65,67,84,73,86	BK
										•180 DATA65,84,69,68,146,45,68,79,32,78	OG
										•190 DATA79,84,32,69,68,73,84,32,76,73	KD
										•200 DATA78,69,83,13,0,68,69,76,85,88	IN
										•210 DATA69,32,76,73,83,84,32,18,68,73	JJ
										•220 DATA83,65,66,76,69,68,146,45,89,79	PD
										•230 DATA85,32,77,65,89,32,69,68,73,84	DP
										•240 DATA32,76,73,78,69,83,13,0,0,0	AD
										•250 DATA0	LH

DELUXE LIST 828

DELUXE LIST FROM PAGE 36

DELUXE LIST 49152

•10 FOR ADD=49152T049342:READN:CK=CK+N:PO	HP
KEADD,N:NEXT	HP
•20 IF CK<>19399 THEN PRINT"ERROR IN DATA	MJ
STATEMENTS[3"."]:STOP	MJ
•30 PRINT"'SYS49152' TO TOGGLE DELUXE LIS	OG
T"	OG
•40 SYS49152	KF
•50 END	IC
•60 DATA173,189,192,73,255,141,189,192,20	JN
8,18	JN
•70 DATA169,26,141,6,3,169,167,141,7,3	DF
•80 DATA169,145,160,192,32,30,171,96,169,	FF
51	FF
•90 DATA141,6,3,169,192,141,7,3,169,102	DE
•100 DATA160,192,32,30,171,169,0,141,190,	PI
192	PI
•110 DATA96,141,188,192,201,34,208,8,173,	IL
190	IL
•120 DATA192,73,255,141,190,192,173,188,1	EB
92,201	EB
•130 DATA58,208,18,173,190,192,208,13,169	NH
,13	NH
•140 DATA32,210,255,169,32,32,210,255,32,	

AHOY! BBS GOES 1200 BAUD!

Effective immediately, the 24 hour a day *Ahoy!* Bulletin Board System can be accessed at 300 or 1200 baud, in 40 or 80 columns. Set your modem for full duplex, no parity, 1 stop bit, 8-bit word length, and dial

718-383-8909

DETONATION FROM PAGE 56

Beginning address in hex: C000

Ending address in hex: C85F

SYS to start: 49152

Flankspeed required for entry! See page 121.

C000: 20 C3 C2 4C CB C5 A9 00 2E
C008: 8D B6 03 AD B7 03 8D FD 43
C010: 07 8D FE 07 8D FF 07 EE 2E
C018: B7 03 AD B7 03 C9 C8 D0 9E
C020: 05 A9 C4 8D B7 03 EA AD 74
C028: B9 03 D0 1B EE B8 03 AD 29
C030: B8 03 C9 AE D0 04 EE B9 E1
C038: 03 60 AD B8 03 8D 0B D0 6E
C040: CE 0D D0 EE 0E D0 60 CE E9
C048: B8 03 AD B8 03 C9 6A D0 72
C050: 04 CE B9 03 60 AD B8 03 A9
C058: 8D 0B D0 EE 0D D0 CE 0E 6B
C060: D0 60 AD E7 03 C9 06 B0 AA
C068: 03 4C 81 C0 A9 00 8D E7 19
C070: 03 AD F8 07 C9 C9 F0 06 AB
C078: EE F8 07 4C 81 C0 CE F8 BD
C080: 07 AD 00 DC 29 08 D0 2A 3E
C088: EE E7 03 AD 10 D0 29 01 1B
C090: D0 16 E6 FB A5 FB C9 FF C5
C098: D0 18 E6 FB 18 AD 10 D0 0B
C0A0: 69 01 8D 10 D0 4C B2 C0 39
C0A8: E6 FB A5 FB C9 39 D0 02 03
C0B0: C6 FB AD 00 DC 29 04 D0 FB
C0B8: 2C EE E7 03 AD 10 D0 29 76
C0C0: 01 D0 0D C6 FB A5 FB C9 CD
C0C8: 1D D0 1A E6 FB 4C E5 C0 A6
C0D0: C6 FB A5 FB C9 00 D0 0D DC
C0D8: 38 AD 10 D0 E9 01 8D 10 28
C0E0: D0 A9 FF 85 FB AD 00 DC 67
C0E8: 29 02 D0 0D EE E7 03 E6 B2
C0F0: FC A5 FC C9 DD D0 02 C6 D1
C0F8: FC AD 00 DC 29 01 D0 0D 88
C100: EE E7 03 C6 FC A5 FC C9 0A
C108: 33 D0 02 E6 FC A5 FB 8D 21
C110: 00 D0 A5 FC 8D 01 D0 20 03
C118: 8E C6 EA CE BC 02 AD BC 50
C120: 02 D0 26 A9 20 8D 04 D4 49
C128: A9 01 8D BC 02 CE BE 02 AE
C130: AD BE 02 D0 14 EE BD 02 32
C138: AE BD 02 E0 1F D0 1A A2 34
C140: FF 8E BD 02 A9 01 8D BE 85
C148: 02 A9 00 8D C5 02 EE C5 FD
C150: 02 AD C5 02 C9 05 D0 F6 5E
C158: 60 A9 21 8D 04 D4 BD DD 85
C160: C9 8D 00 D4 BD FD C9 8D 9F
C168: 01 D4 BD 1D CA 8D BC 02 30
C170: 18 6D BC 02 8D BE 02 4C 4F
C178: 49 C1 E6 FD A5 FD C9 0B E0
C180: D0 07 20 06 C0 A9 00 85 6E
C188: FD 20 62 C0 EA EA AD CA 18

C190: 03 20 B8 C1 A9 80 8D 12 F7
C198: D4 A2 00 E8 E0 00 D0 FB A6
C1A0: AD CB 03 20 B8 C1 A9 81 E2
C1A8: 8D 12 D4 20 DE FF 8E CF 7A
C1B0: 03 E0 01 B0 0A 4C 3D C2 9C
C1B8: 8D E7 07 60 EA EA EA AD 04
C1C0: B9 C1 8D CE C1 AD BA C1 84
C1C8: 8D CF C1 A9 20 8D 06 04 49
C1D0: EA EA EA AD C6 03 C9 6B 3E
C1D8: D0 03 4C C2 C4 AD C6 03 F7
C1E0: AA BD 3E CA 8D B9 C1 BD 19
C1E8: AA CA 8D BA C1 EE C6 03 21
C1F0: AD B9 C1 C9 27 D0 0A A9 8F
C1F8: 25 8D CA 03 A9 26 8D CB A2
C200: 03 AD B9 C1 C9 00 D0 0A D0
C208: A9 27 8D CA 03 A9 28 8D 93
C210: CB 03 AD B9 C1 C9 C0 D0 63
C218: 0A A9 29 8D CA 03 A9 2A 24
C220: 8D CB 03 AD B9 C1 C9 D3 43
C228: D0 0A A9 23 8D CA 03 A9 D4
C230: 24 8D CB 03 A9 00 A2 00 FC
C238: A0 00 20 DB FF AD 1E D0 71
C240: C9 00 F0 08 A9 00 8D 1E 58
C248: D0 4C BF C1 AD 1F D0 C9 4E
C250: 00 F0 03 20 63 C2 AD C0 F8
C258: 03 C9 03 D0 03 20 60 C4 41
C260: 4C 7A C1 AD 01 D0 C9 64 96
C268: B0 13 AD A7 02 D0 28 A9 26
C270: 20 8D 63 04 EE A7 02 EE 0D
C278: C0 03 4C A8 C2 AD 10 D0 82
C280: C9 45 D0 14 AD A8 02 D0 9D
C288: 0E A9 20 8D 04 06 EE A8 8F
C290: 02 EE C0 03 4C A8 C2 60 5D
C298: AD A9 02 D0 FA A9 20 8D 15
C2A0: E3 05 EE A9 02 EE C0 03 D6
C2A8: A9 41 8D 04 D4 8D 00 D4 5C
C2B0: A0 14 20 8E C6 8C 01 D4 3D
C2B8: 88 C0 00 D0 F5 A9 00 8D FF
C2C0: 1F D0 60 AD 0E DC 29 FE D1
C2C8: 8D 0E DC A5 01 29 FB 85 92
C2D0: 01 A2 00 BD 00 D0 9D 00 A0
C2D8: 38 E8 E0 00 D0 F5 A2 00 44
C2E0: BD 00 D1 9D 00 39 E8 E0 11
C2E8: 00 D0 F5 A2 00 BD 65 C9 3F
C2F0: 9D 18 39 E8 E0 50 D0 F5 C0
C2F8: A2 00 BD B5 C9 9D D8 38 87
C300: E8 E0 28 D0 F5 A5 01 09 68
C308: 04 85 01 AD 0E DC 09 01 35
C310: 8D 0E DC 18 AD 18 D0 29 60
C318: F0 69 0E 8D 18 D0 A2 00 99
C320: BD AE C6 9D 00 D0 E8 E0 8B
C328: 2F D0 F5 A2 00 BD DD C6 23
C330: 9D F8 07 E8 E0 08 D0 F5 66
C338: A2 00 BD E5 C6 9D 00 30 13
C340: E8 E0 00 D0 F5 A2 00 BD 31
C348: E5 C7 9D 00 31 E8 E0 00 8E
C350: D0 F5 A2 00 BD E5 C8 9D C3
C358: 00 32 E8 E0 80 D0 F5 A2 3E

C360:	00	BD	15	CB	9D	00	D4	E8	5A	C530:	8D	20	D0	8D	0F	D4	20	8E	CE
C368:	E0	19	D0	F5	A9	00	8D	B9	1A	C538:	C6	CE	C9	03	AD	C9	03	C9	DE
C370:	03	8D	B6	03	8D	E7	03	8D	C0	C540:	00	D0	E7	20	8E	C6	8D	18	14
C378:	C0	03	8D	C6	03	8D	CF	03	F3	C548:	D4	A2	00	BD	2E	CB	9D	C7	DC
C380:	8D	BC	02	8D	BD	02	8D	BE	66	C550:	05	A9	06	9D	C7	D9	E8	E0	0E
C388:	02	8D	C5	02	AD	00	D0	85	E3	C558:	0A	D0	F0	A2	00	BD	38	CB	88
C390:	FB	AD	01	D0	85	FC	A9	6A	A2	C560:	9D	17	06	A9	02	9D	17	DA	56
C398:	8D	B8	03	A9	C4	8D	B7	03	98	C568:	E8	E0	0A	D0	F0	AD	00	DC	88
C3A0:	A9	E7	8D	B9	C1	A9	07	8D	79	C570:	29	10	D0	F9	A9	00	8D	A7	53
C3A8:	BA	C1	A9	1C	8D	FE	02	20	99	C578:	02	8D	A8	02	8D	A9	02	A2	8E
C3B0:	D2	FF	A9	93	20	D2	FF	A9	5D	C580:	00	BD	5A	CB	9D	C7	05	9D	6C
C3B8:	00	8D	FF	02	AD	FF	02	AA	A2	C588:	17	06	E8	E0	0A	D0	F2	A2	DF
C3C0:	BD	3E	CA	8D	D0	C3	BD	AA	12	C590:	00	BD	A7	C5	9D	1D	CA	E8	2A
C3C8:	CA	8D	D1	C3	AD	FE	02	8D	F2	C598:	E0	20	D0	F5	A9	0B	8D	7F	22
C3D0:	D3	07	EE	FF	02	AD	D0	C3	DE	C5A0:	C1	20	C3	C2	4C	7A	C1	19	AA
C3D8:	C9	4F	D0	03	EE	FE	02	AD	63	C5A8:	19	12	0E	0E	19	12	12	12	3F
C3E0:	D0	C3	C9	27	D0	05	A9	1B	01	C5B0:	12	0E	0E	0E	0E	19	15	0E	37
C3E8:	8D	FE	02	AD	D0	C3	C9	01	84	C5B8:	15	0E	15	0E	0E	0E	0E	0E	37
C3F0:	D0	05	A9	1E	8D	FE	02	AD	CA	C5C0:	19	19	12	0E	0E	19	19	EA	3E
C3F8:	D0	C3	C9	00	D0	05	A9	1C	F2	C5C8:	EA	EA	EA	A2	00	BD	4E	CB	04
C400:	8D	FE	02	AD	D0	C3	C9	98	33	C5D0:	9D	C7	05	A9	0D	9D	C7	D9	31
C408:	D0	05	A9	1F	8D	FE	02	AD	E2	C5D8:	E8	E0	0A	D0	F0	AD	58	CB	40
C410:	D0	C3	C9	C0	D0	05	A9	1B	C9	C5E0:	8D	F3	05	AD	59	CB	8D	F4	BC
C418:	8D	FE	02	AD	D0	C3	C9	D2	85	C5E8:	05	A2	00	BD	42	CB	9D	16	10
C420:	D0	05	A9	2C	8D	FE	02	AD	08	C5F0:	06	A9	05	9D	16	DA	E8	E0	FD
C428:	D0	C3	C9	D3	D0	03	4C	34	AE	C5F8:	0C	D0	F0	A2	00	BD	38	CB	2B
C430:	C4	4C	BC	C3	A9	23	8D	CA	E6	C600:	9D	67	06	A9	01	9D	67	DA	95
C438:	03	A9	24	8D	CB	03	A9	03	12	C608:	E8	E0	0A	D0	F0	EA	AD	00	36
C440:	20	D2	FF	A9	2B	8D	63	04	FC	C610:	DC	29	10	F0	09	20	1B	C1	1D
C448:	8D	E3	05	8D	04	06	A9	00	FF	C618:	20	8E	C6	4C	0E	C6	A2	00	51
C450:	8D	C1	03	8D	1F	D0	A9	DC	A6	C620:	AD	5A	CB	9D	C6	05	9D	EE	E9
C458:	8D	93	C4	8D	98	C4	60	EA	74	C628:	05	9D	16	06	9D	66	06	E8	D9
C460:	A5	FB	C9	A0	B0	01	60	A5	24	C630:	E0	0C	D0	EC	A9	00	8D	A7	B9
C468:	FB	C9	AF	90	01	60	A5	FC	72	C638:	02	8D	A8	02	8D	A9	02	4C	F7
C470:	C9	CF	B0	01	60	A5	FC	C9	88	C640:	7A	C1	EA	A2	00	BD	A2	C6	31
C478:	D7	90	01	60	A9	00	8D	A7	21	C648:	9D	9E	05	A9	04	9D	9E	D9	4D
C480:	02	8D	A8	02	8D	A9	02	8D	81	C650:	E8	E0	0C	D0	F0	EE	C6	03	A0
C488:	C0	03	EE	93	C4	EE	98	C4	DF	C658:	AD	C6	03	C9	6D	D0	03	4C	27
C490:	A9	2B	8D	DC	07	A9	08	8D	16	C660:	81	C6	AD	A6	05	C9	39	F0	F5
C498:	DC	DB	EE	C1	03	AD	C1	03	77	C668:	06	EE	A6	05	4C	55	C6	A9	1B
C4A0:	C9	0B	D0	03	4C	43	C6	CE	6E	C670:	30	8D	A6	05	AD	A5	05	C9	FB
C4A8:	7F	C1	A2	1F	DE	1D	CA	CA	3D	C678:	39	F0	06	EE	A5	05	4C	55	E3
C4B0:	E0	FF	D0	F8	A9	2B	8D	63	21	C680:	C6	A9	DC	8D	93	C4	8D	98	D9
C4B8:	04	8D	E3	05	8D	04	06	4C	17	C688:	C4	A9	00	4C	46	C5	A9	00	F8
C4C0:	7A	C1	A9	00	8D	C9	03	A9	AA	C690:	8D	F2	03	EE	F2	03	AD	F2	99
C4C8:	C0	8D	C2	03	A9	81	8D	12	A7	C698:	03	C9	00	D0	F6	60	EA	EA	63
C4D0:	D4	A9	93	20	D2	FF	20	8E	84	C6A0:	EA	EA	13	03	0F	12	05	20	D2
C4D8:	C6	A2	00	DE	01	D0	E8	E8	C4	C6A8:	20	30	30	30	30	30	A6	D2	33
C4E0:	E0	10	D0	F7	CE	02	D0	CE	0B	C6B0:	21	85	21	85	9B	3B	9B	D3	44
C4E8:	0A	D0	CE	04	D0	EE	0C	D0	33	C6B8:	50	6A	06	AE	85	5A	44	1B	67
C4F0:	AD	09	D0	8D	21	D0	8D	0F	94	C6C0:	00	00	00	FF	C8	1E	1F	00	C6
C4F8:	D4	A2	00	AD	C2	03	9D	F9	7B	C6C8:	00	00	00	1E	00	00	00	00	E6
C500:	07	E8	E0	04	D0	F8	EE	C2	50	C6D0:	00	00	00	00	00	0D	06	06	E9
C508:	03	AD	C2	03	C9	C4	D0	05	E2	C6D8:	06	01	07	07	07	C8	C0	C1	40
C510:	A9	C0	8D	C2	03	EE	C9	03	89	C6E0:	C2	C3	C4	C4	C4	FF	FF	FC	B2
C518:	AD	C9	03	C9	DC	D0	03	4C	59	C6E8:	C0	00	0C	C0	00	00	C0	00	37
C520:	25	C5	4C	D6	C4	A9	00	8D	2A	C6F0:	00	C0	00	00	C0	00	00	C0	33
C528:	15	D0	AD	C9	03	8D	21	D0	08	C6F8:	00	00	C0	00	00	C0	00	00	7A

C700:	C0	00	00	C0	00	00	C0	00	42	C8D0:	3E	00	18	00	00	0C	00	00	33
C708:	00	C0	00	00	C0	00	00	C0	4A	C8D8:	06	00	00	02	00	00	00	00	E0
C710:	00	00	C0	00	0C	FF	FF	FC	D9	C8E0:	00	00	00	00	00	00	00	00	E0
C718:	00	00	00	00	00	00	00	00	18	C8E8:	00	00	00	00	00	00	00	00	E8
C720:	00	00	00	00	00	FF	FF	FC	1D	C8F0:	00	00	00	00	00	00	00	00	F0
C728:	C0	00	0C	00	00	0C	00	00	01	C8F8:	00	00	00	00	00	00	10	00	09
C730:	0C	00	00	0C	00	00	0C	00	54	C900:	00	54	00	00	54	00	00	10	B8
C738:	00	0C	00	00	0C	00	00	0C	5C	C908:	00	00	38	00	00	FE	00	01	40
C740:	00	00	0C	00	00	0C	00	00	58	C910:	7D	00	06	7D	80	00	7C	00	0E
C748:	0C	00	00	0C	00	00	0C	00	6C	C918:	00	7C	00	00	44	00	00	24	FC
C750:	00	0C	C0	00	0C	FF	FF	FC	26	C920:	00	00	36	00	00	00	00	00	56
C758:	00	00	00	00	00	00	00	00	58	C928:	00	00	00	00	00	00	00	00	28
C760:	00	00	00	00	00	FF	FF	FF	60	C930:	00	00	00	00	00	00	00	00	30
C768:	C0	00	03	C0	00	03	C0	00	B0	C938:	00	00	00	00	00	00	10	00	48
C770:	03	C0	00	03	C0	00	03	C0	BB	C940:	00	54	00	00	54	00	00	10	F8
C778:	00	03	C0	00	03	C0	00	03	03	C948:	00	00	38	00	00	FE	00	01	80
C780:	C0	00	03	C0	00	03	C0	00	C8	C950:	7D	00	03	7C	C0	00	7C	00	8A
C788:	03	C0	00	03	C0	00	03	F0	04	C958:	00	7C	00	00	44	00	00	44	5D
C790:	00	0F	00	00	00	00	00	00	9F	C960:	00	00	C6	00	00	18	18	18	6F
C798:	00	00	00	00	00	00	00	00	98	C968:	18	18	24	4A	91	18	18	18	E0
C7A0:	00	00	00	00	00	F0	00	0F	A0	C970:	18	3C	5A	A5	00	00	07	08	D3
C7A8:	C0	00	03	C0	00	03	C0	00	F0	C978:	F5	F2	08	07	00	00	0C	10	8C
C7B0:	03	C0	00	03	C0	00	03	C0	FB	C980:	E4	E8	10	0C	00	89	52	24	6A
C7B8:	00	03	C0	00	03	C0	00	03	43	C988:	18	18	18	18	18	00	A5	5A	01
C7C0:	C0	00	03	C0	00	03	C0	00	09	C990:	3C	18	18	18	18	00	E0	10	1E
C7C8:	03	C0	00	03	C0	00	03	FF	53	C998:	BF	5F	10	E0	00	00	30	08	E0
C7D0:	FF	FF	00	00	00	00	00	00	D0	C9A0:	27	17	08	30	00	18	18	7E	C5
C7D8:	00	00	00	00	00	00	00	00	D8	C9A8:	FF	FF	FF	FF	7E	18	18	18	6F
C7E0:	00	00	00	00	00	00	00	00	E0	C9B0:	F8	F8	00	00	00	00	00	00	A2
C7E8:	00	00	00	01	FF	00	03	01	ED	C9B8:	FF	FF	00	00	00	18	18	18	01
C7F0:	80	06	00	C0	0C	00	60	18	BC	C9C0:	18	18	18	18	18	00	00	00	39
C7F8:	00	30	00	7C	30	00	C6	30	CC	C9C8:	F8	F8	18	18	18	00	00	00	03
C800:	01	86	30	01	8C	30	01	80	F6	C9D0:	1F	1F	18	18	18	18	18	18	9F
C808:	60	00	C0	C0	00	7F	80	00	E9	C9D8:	1F	1F	00	00	00	47	B4	47	5A
C810:	00	00	00	00	00	00	00	00	10	C9E0:	47	47	F4	47	47	ED	ED	47	16
C818:	00	00	00	00	00	00	00	00	18	C9E8:	47	47	47	ED	E9	0C	E9	0C	98
C820:	00	00	00	00	00	00	00	00	20	C9F0:	E9	0C	E9	0C	47	ED	47	B4	0E
C828:	00	00	00	00	00	40	00	00	68	C9F8:	47	47	47	F4	F4	05	04	05	C6
C830:	60	00	00	30	00	00	18	00	D8	CA00:	05	05	03	05	05	05	05	06	27
C838:	7C	0C	00	C6	0C	01	83	0C	24	CA08:	06	06	06	05	07	07	07	07	3B
C840:	03	01	0C	03	1B	0C	03	0E	8B	CA10:	07	07	07	07	06	05	05	04	40
C848:	0C	03	00	18	01	80	30	00	21	CA18:	05	05	05	03	03	19	19	12	71
C850:	C0	60	00	3F	C0	00	00	00	71	CA20:	0E	0E	19	12	12	12	12	0E	AB
C858:	00	00	00	00	00	00	00	00	58	CA28:	0E	0E	0E	19	15	0E	15	0E	B1
C860:	00	00	00	00	00	00	00	00	60	CA30:	15	0E	0E	0E	0E	0E	19	19	BD
C868:	00	00	00	00	00	00	00	00	68	CA38:	12	0E	0E	19	19	5A	E7	BF	9A
C870:	00	00	00	00	00	00	00	00	70	CA40:	97	6F	47	1F	F7	CF	A7	7F	9C
C878:	00	00	00	FF	00	01	81	80	7B	CA48:	57	2F	07	DF	B7	8F	67	3F	A3
C880:	03	00	C0	06	18	C0	06	30	59	CA50:	17	EF	C7	9F	77	4F	27	26	D2
C888:	C0	06	31	80	06	1F	00	06	2C	CA58:	25	24	23	22	21	20	1F	1E	65
C890:	00	0C	03	00	18	01	80	30	69	CA60:	1D	1C	1B	1A	19	18	17	16	2D
C898:	00	C0	60	00	7F	C0	00	00	F9	CA68:	15	14	13	12	11	10	0F	0E	F4
C8A0:	00	00	00	00	00	00	00	00	A0	CA70:	0D	0C	0B	0A	09	08	07	06	BC
C8A8:	00	00	00	00	00	00	00	00	A8	CA78:	05	04	03	02	01	00	28	50	FF
C8B0:	00	00	00	00	03	FC	00	06	B6	CA80:	78	A0	C8	F0	18	40	68	90	A4
C8B8:	03	00	0C	01	80	18	00	C0	22	CA88:	B8	E0	08	30	58	80	A8	D0	AC
C8C0:	30	70	C0	30	D8	C0	30	80	9C	CA90:	F8	20	48	70	98	C0	C1	C2	40
C8C8:	C0	30	C1	80	30	63	00	30	BF	CA98:	C3	C4	C5	C6	C7	C8	C9	CA	D2

CAA0: CB CC CD CE CF D0 D1 D2 1B	CB00: 07 07 07 07 07 07 07 07 38
CAA8: D3 00 07 07 07 07 07 07 07 A6	CB08: 07 07 07 07 07 07 07 07 40
CAB0: 06 06 06 06 06 06 06 06 05 DF	CB10: 07 07 07 07 07 00 00 00 33
CAB8: 05 05 05 05 05 04 04 04 DD	CB18: 14 20 0A 0A 00 00 00 00 60
CAC0: 04 04 04 04 04 04 04 04 E0	CB20: 00 00 00 0A 01 00 00 80 AB
CAC8: 04 04 04 04 04 04 04 04 E8	CB28: 01 FA 00 00 00 0F 07 01 3B
CAD0: 04 04 04 04 04 04 04 04 F0	CB30: 0D 05 20 20 0F 16 05 12 BE
CAD8: 04 04 04 04 04 04 04 04 F8	CB38: 10 12 05 13 13 20 06 09 B4
CAE0: 04 04 04 04 04 04 04 04 01	CB40: 12 05 02 0F 02 20 02 0C 98
CAE8: 04 04 04 04 04 04 04 04 09	CB48: 01 03 0B 0D 05 12 04 05 84
CAF0: 05 05 05 05 05 05 06 06 1B	CB50: 14 0F 0E 01 14 09 0F 0E BC
CAF8: 06 06 06 06 06 07 07 07 2C	CB58: 02 19 20 00 FF 00 FF 00 93

SCUTTLEBUTT

Continued from page 14

will be made available for popular sampling units at a later date.)

MIDImouse Music, 503-622-5451 (see address list, page 14).

DELUXEPAINT ADD-ONS

Two new EA programs for use with *DeluxePaint*, each \$99.95:

The *DeluxePaint* color printing program has 15 formats for creating a variety of greeting cards, banners, and the like. An unlimited number of images can be placed on the page, edited, flipped, shrunk or expanded, and changed in color. All II Amiga fonts plus 3 sizes and 3 styles are supported, for a total of 99 text types. Two sets of large character are useful for banners and posters.

DeluxeVideo allows owners of a 512K Amiga and a VCR to create video presentations for business, education, or entertainment use. The video editor includes 27 special effects like wipes, fades, and dissolves, 3-D axis rotation for titles, strobes, and multiframe animation, plus zoom, shrink, disappear, move, and color cycle. An onscreen remote controller provides 12 commands including

fast forward/reverse, single step, and cycle repeat.

A library of images is included; or, drawings from *DeluxePaint* or other IFF-compatible graphics packages can be animated in any sequence or speed. Music scores and digitized sound effects like crashes, booms, and screeches are provided.

Electronic Arts, 415-571-7171 (see address list, page 14).

HANDWRITING ANALYZER

Handwriting Analyzer (\$19.95) utilizes various well-known theories to generate a page-long analysis of a writer, based on the C-64 user's answers to 20 questions concerning a writing sample of 300 words or more. Available on disk or tape.

CTL Software, 408-263-1623 (see address list, page 14).

QUANTUMLINK ADDITIONS

The latest new services on QuantumLink include a GEOS forum (Q & A sessions with the program's developers, conferences on applications, news on latest developments and software), a Photo Gallery (converts subscriber photographs into computer programs for downloading), and RockLink (news on top

stars, music review board, rock library, and monthly guests). Additionally, the Mall has been expanded to include a live auction.

QuantumLink, 800-392-8200 or 703-448-8700 (see address list, page 14).

FOUR MORE

Four More for the 64 (\$9.95), a second disk of programs from AC3L Software, includes *TV Align* (checks colors, sound, etc.), *Treasure Map* (treasure searching game), *Find It* (locates words in hidden word puzzles), and *Trivia* (500 questions for 1-6 players or teams). PA residents must add 6% sales tax.

AC3L Software (see address list, page 14).

BBS SYSTEM

The *Syntech BBS Construction Set* (\$49.95), a C-64 bulletin board system, includes an editor with onscreen formatting and wordwrap, 12-hour clock and day of the week calendar, printer dump option, up to 25 subboards with rotating, self-maintaining message base, 11 customizable status levels, remote operation, and other features.

KIRA Corporation, 215-683-5699 (see address list, page 14).

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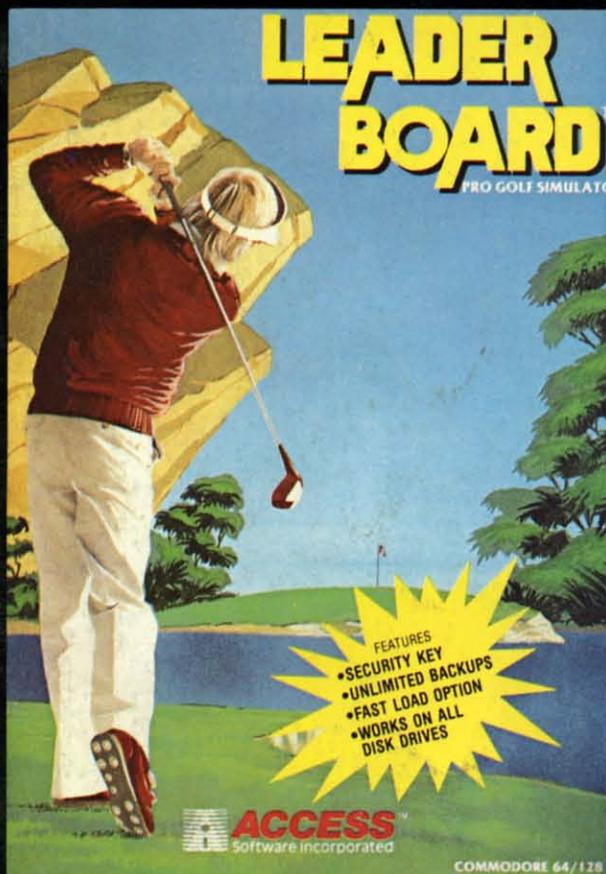
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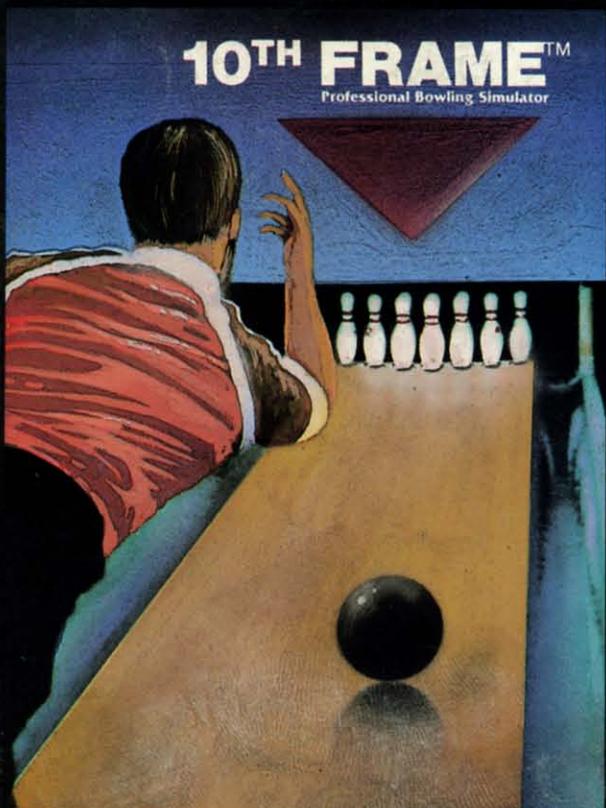
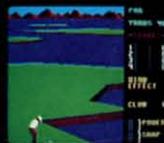
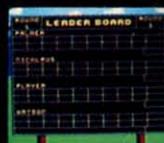


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