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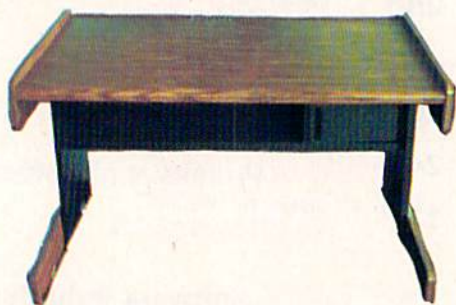
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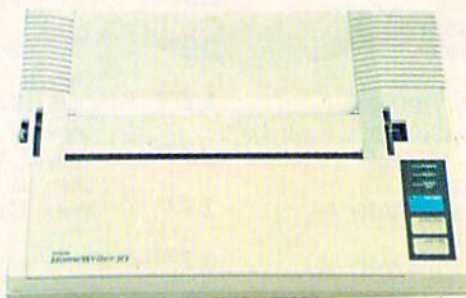


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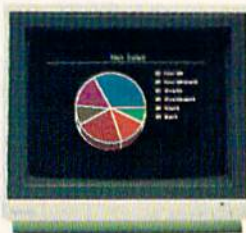


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The company is also introducing the Complete Beginner's I/O Interface Course, an introductory course on computer interfacing. The complete course retails for \$159 and includes the BH100 I/O interface, a beginner's module, and an illustrated course manual. The manual can also be purchased separately for \$15.

Intelligent I/O, P.O. Box 70, Potsdam, NY 13676.

Circle Reader Service Number 214.

Bulletin Board System Software

Blue Board, from SOTA Computing Systems, is a BBS program for the Commodore 64. It supports over 200 online messages (up to 1023 characters each), up to 220 users, and over 25 SYSOP-definable sub-boards. The software is written entirely in machine language and employs highly optimized disk driver routines, making it a very fast system.

Other features of the board include remote SYSOP access, a private SYSOP sub-board, and unlimited session connect time. Each of these features is password-protected for system security. *Blue Board* also features "scribbles," mini sub-boards where messages of 80 characters or less may be used for opinion forums, voting, chess games, or other applications. The system has been designed to provide the SYSOP with total system control. Suggested retail price is \$69.95.

SOTA Computing Systems Ltd., 213-1080 Broughton St., Vancouver, B.C., Canada V6G 2A8.

Circle Reader Service Number 215.

New Commodore-Compatible Printer

Star Micronics has introduced the NX-10C Commodore-compatible printer, with NLQ (near-letter-quality) and draft modes. The printer connects directly to the Commodore 64 and 128 computers through a built-in Commodore serial interface. Speeds range from 120 characters per second (cps) for draft output to 30 cps for NLQ type.

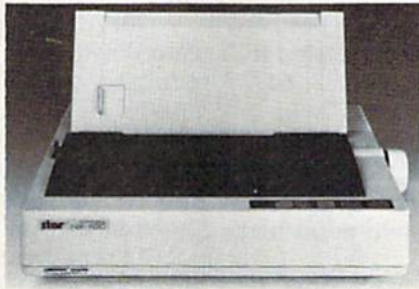
Front-panel controls on the NX-10C make the printer easier to use, and there's fingertip selection of draft or NLQ modes, typeface and print pitch, and margin settings and form alignment as well. Flipping the automatic-paper-feed lever feeds single sheets into position for printing on whatever line you designate. An adjustable rear tractor feed, as well as friction feed, are standard features that allow for either fanfold or cut-sheet paper printing. In addition, preprinted forms can be aligned by adjusting the forward and reverse micro feed.

The NX-10C has its own built-in character set, offering upper- and lowercase letters, numbers, and symbols in NLQ mode with the addition of block graphics in high-speed draft mode. Full Commodore MPS-803 emulation allows graphics to be integrated into the printing. The printer is bidirectional; also, logic seeking is a standard feature of the NX-10C. The printer comes with a snap-in ribbon cassette.

The suggested retail price for the NX-10C is \$349.

Star Micronics, 200 Park Ave., Suite 3510, New York, NY 10166.

Circle Reader Service Number 216.



The Star Micronics NX-10C is a new Commodore-compatible dot-matrix printer.

General Ledger Program

Bookkeeper-64 from Datacount Software is a single-entry general ledger program for home or small business use. This software for the Commodore 64 incorporates a chart of accounts, transaction register, and income statement. The displays are menu-driven, and the reports can be printed out for permanent record.

Two additional programs are included in the package. *List-64* is a list processing program with up to ten fields in each file. *Biorhythm-64* produces a biorhythm chart and a list of critical days.

Bookkeeper-64 is available for \$19.95 plus \$2 shipping and handling. California residents should add 6% sales tax.

Datacount Software, P.O. Box 1679, Coronado, CA 92118.

Circle Reader Service Number 217.

SpeedScript Customization

Speedmate is a customization program for the *SpeedScript* word processor (versions 3.0-3.2) that lets you set the defaults you prefer and control the way text appears on the screen while editing. *Speedmate* includes an optional print preview routine which displays 80 columns of text onscreen at once with no horizontal scrolling. *Speedmate* also customizes *COMPUTE!'s Preview-80* control commands for one-hand operation. (*SpeedScript* and *Preview-80* are

products of *COMPUTE!* Publications and are not included with *Speedmate*.)

The program lets you set and save defaults for right, left, top, and bottom margins; page length; spacing; continuous or single-sheet paper; first and starting page numbers; page width (for centering); and more than 35 predefined printer code defaults, as well as screen and letter colors, among other features.

Speedmate is available for \$15 (outside US and Canada, add \$2 per disk; North Carolina residents add 5% sales tax).

Upstart Publishing, Dept. NPGM, P.O. Box 22022, Greensboro, NC 27420.

Circle Reader Service Number 218.

128 Software From Abacus

Three new productivity software packages for the Commodore 128 are now available from Abacus. *SpeedTerm 128* is a flexible, command-driven terminal software package that supports most modems for the 128. It contains the standard options found in most terminal software; plus *SpeedTerm 128* supports Xmodem and Punter file-transfer protocols and VT52 and VT100 terminal emulation with cursor keys. It has a 45K capture buffer and user-definable function keys.

TAS-128 is a technical analysis system for stock market charting. With *TAS-128*, you can download indicators from DNJ/RS or Warner and then create a variety of charts on the split screen using seven moving averages, three oscillators, five volume indicators, comparison charts, trading bands, and least squares. It also has macro capabilities, automatic and unattended log-on, and fast draw charts using up to four windows.

Abacus has upgraded the *Personal Portfolio Manager* for the 128. *PPM-128* tracks the performance of stocks, bonds, options, or profits and losses. It also has very complete reporting capabilities.

SpeedTerm 1128, *TAS-128*, and *PPM-128* all retail for \$59.95 each.

Abacus Software, 2201, Kalamazoo SE, P.O. Box 7211, Grand Rapids, MI 49510.

Circle Reader Service Number 219.

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COMPUTE!'s GAZETTE

Author's Guide

Here are some suggestions which serve to improve the speed and accuracy of publication for prospective authors. COMPUTE!'s GAZETTE is primarily interested in new and timely articles on the Commodore 128, 64, Plus/4, and 16. We are much more concerned with the content of an article than with its style, but articles should as be clear and well-explained as possible.

The guidelines below will permit your good ideas and programs to be more easily edited and published:

1. The upper left corner of the first page should contain your name, address, telephone number, and the date of submission.

2. The following information should appear in the upper right corner of the first page. If your article is specifically directed to one model of computer, please state the model name. In addition, *please indicate the memory requirements of programs.*

3. The underlined title of the article should start about 2/3 of the way down the first page.

4. Following pages should be typed normally, except that in the upper right corner there should be an abbreviation of the title, your last name, and the page number. For example: Memory Map/Smith/2.

5. All lines within the text of the article must be double- or triple-spaced. A one-inch margin should be left at the right, left, top, and bottom of each page. No words should be divided at the ends of lines. And please do not justify. Leave the lines ragged.

6. Standard typing or computer paper should be used (no erasable, onionskin, or other thin paper) and typing should be on one side of the paper only (upper- and lowercase).

7. Sheets should be attached together with a paper clip. Staples should not be used.

8. If you are submitting more than one article, send each one in a separate mailer with its own tape or disk.

9. Short programs (under 20 lines) can easily be included within the text. Longer programs should be separate listings. *It is essential that we have a copy of the program, recorded twice, on a tape or disk.* If your article was written with a word processor, we also appreciate a copy of the text file on the tape or disk. Please use high-quality 10 or 30 minute tapes with the program recorded on both sides. The tape or disk should be labeled with the author's name and the title of the article. Tapes are fairly sturdy, but disks need to be enclosed within plastic or cardboard mailers (available at photography, stationery, or computer

supply stores).

10. A good general rule is to spell out the numbers zero through ten in your article and write higher numbers as numerals (1024). The exceptions to this are: Figure 5, Table 3, TAB(4), etc. Within ordinary text, however, the zero through ten should appear as words, not numbers. Also, symbols and abbreviations should not be used within text: use "and" (not &), "reference" (not ref.), "through" (not thru).

11. For greater clarity, use all capitals when referring to keys (RETURN, CTRL, SHIFT), BASIC words (LIST, RND, GOTO), and the language BASIC. Headlines and subheads should, however, be initial caps only, and emphasized words are not capitalized. If you wish to emphasize, underline the word and it will be italicized during typesetting.

12. Articles can be of any length—from a single-line routine to a multi-issue series. The average article is about four to eight double-spaced, typed pages.

13. If you want to include photographs, they should be either 5×7 black and white glossies or color slides.

14. We do not consider articles which are submitted simultaneously to other publishers. If you wish to send an article to another magazine for consideration, please do not submit it to us.

15. COMPUTE!'s GAZETTE pays between \$70 and \$800 for published articles. In general, the rate reflects the length and quality of the article. Payment is made upon acceptance. Following submission (Editorial Department, COMPUTE!'s GAZETTE, P.O. Box 5406, Greensboro, NC 27403) it will take from two to four weeks for us to reply. If your work is accepted, you will be notified by a letter which will include a contract for you to sign and return. *Rejected manuscripts are returned to authors who enclose a self-addressed, stamped envelope.*

16. If your article is accepted and you have since made improvements to the program, please submit an entirely new tape or disk and a new copy of the article reflecting the update. We cannot easily make revisions to programs and articles. It is necessary that you send the revised version as if it were a new submission entirely, but be sure to indicate that your submission is a revised version by writing, "Revision" on the envelope and the article.

17. COMPUTE!'s GAZETTE does not accept unsolicited product reviews. If you are interested in serving on our panel of reviewers, contact our Features Editor for details.

How To Type In COMPUTE!'s GAZETTE Programs

Each month, COMPUTE!'s GAZETTE publishes programs for the Commodore 128, 64, Plus/4, 16, and VIC-20. Each program is clearly marked by title and version. Be sure to type in the correct version for your machine. All 64 programs run on the 128 in 64 mode. Be sure to read the instructions in the corresponding article. This can save time and eliminate any questions which might arise after you begin typing.

We frequently publish two programs designed to make typing easier: The Automatic Proofreader, and MLX, designed for entering machine language programs.

When entering a BASIC program, be especially careful with DATA statements as they are extremely sensitive to errors. A mistyped number in a DATA statement can cause your machine to "lock up" (you'll have no control over the computer). If this happens, the only recourse is to turn your computer off then back on, erasing whatever was in memory. So be sure to *save a copy of your program before you run it*. If your computer crashes, you can always reload the program and look for the error.

Special Characters

Most of the programs listed in each issue contain special control characters. To facilitate typing in any programs from the GAZETTE, use the following listing conventions.

The most common type of control characters in our listings appear as words within braces: {DOWN} means to press the cursor down key; {5 SPACES} means to press the space bar five times.

To indicate that a key should be *shifted* (hold down the SHIFT key while pressing another key), the character is underlined. For example, A means hold down the SHIFT key and press A. You may see strange characters on your screen, but that's to be expected. If you find a number followed by an underlined key enclosed in braces (for example, {8 A}), type the key as many times as indicated (in our example, enter eight SHIFTed A's).

If a key is enclosed in special brackets, [F], hold down the Commodore key (at the lower left corner of the keyboard) and press the indicated character.

Rarely, you'll see a single letter of the alphabet enclosed in braces.

This can be entered on the Commodore 64 by pressing the CTRL key while typing the letter in braces. For example, {A} means to press CTRL-A.

The Quote Mode

Although you can move the cursor around the screen with the CRSR keys, often a programmer will want to move the cursor under program control. This is seen in examples such as {LEFT} and {HOME} in the program listings. The only way the computer can tell the difference between direct and programmed cursor control is the *quote mode*.

Once you press the quote key, you're in quote mode. This mode can be confusing if you mistype a character and cursor left to change it. You'll see a reverse video character (a graphics symbol for cursor left). In this case, you can use the DELETE key to back up and edit the line. Type another quote and you're out of quote mode. If things really get confusing, you can exit quote mode simply by pressing RETURN. Then just cursor up to the mistyped line and fix it.

When You Read:	Press:	See:
{CLR}	SHIFT CLR/HOME	
{HOME}	CLR/HOME	
{UP}	SHIFT ↑ CRSR ↓	
{DOWN}	↑ CRSR ↓	
{LEFT}	SHIFT ← CRSR →	
{RIGHT}	← CRSR →	
{RVS}	CTRL 9	
{OFF}	CTRL 0	
{BLK}	CTRL 1	
{WHT}	CTRL 2	
{RED}	CTRL 3	
{CYN}	CTRL 4	

When You Read:	Press:	See:
{PUR}	CTRL 5	
{GRN}	CTRL 6	
{BLU}	CTRL 7	
{YEL}	CTRL 8	
{F1}	f1	
{F2}	SHIFT f1	
{F3}	f3	
{F4}	SHIFT f3	
{F5}	f5	
{F6}	SHIFT f5	
{F7}	f7	
{F8}	SHIFT f7	

When You Read:	Press:	See:
←	←	
↑	SHIFT ↑	

For Commodore 64 Only

[1]	COMMODORE	1	
[2]	COMMODORE	2	
[3]	COMMODORE	3	
[4]	COMMODORE	4	
[5]	COMMODORE	5	
[6]	COMMODORE	6	
[7]	COMMODORE	7	
[8]	COMMODORE	8	

The Automatic Proofreader

Philip I. Nelson, Assistant Editor

"The Automatic Proofreader" helps you type in program listings for the 128, 64, Plus/4, 16, and VIC-20 and prevents nearly every kind of typing mistake.

Type in the Proofreader *exactly* as listed. Since the program can't check itself, type carefully to avoid mistakes. Don't omit any lines, even if they contain unfamiliar commands. After finishing, save a copy or two on disk or tape before running it. This is important because the Proofreader erases the BASIC portion of itself when you run it, leaving only the machine language portion in memory.

Next, type RUN and press RETURN. After announcing which computer it's running on, the Proofreader displays the message "Proofreader Active". Now you're ready to type in a BASIC program.

Every time you finish typing a line and press RETURN, the Proofreader displays a two-letter checksum in the upper-left corner of the screen. Compare this result with the two-letter checksum printed to the left of the line in the program listing. If the letters match, it's almost certain the line was typed correctly. If the letters don't match, check for your mistake and correct the line.

The Proofreader ignores spaces not enclosed in quotes, so you can omit or add spaces between keywords and still see a matching checksum. However, since spaces inside quotes are almost always significant, the Proofreader pays attention to them. For example, 10 PRINT "THIS IS BASIC" will generate a different checksum than 10 PRINT "THIS IS BASIC".

A common typing error is transposition—typing two successive characters in the wrong order, like PIRNT instead of PRINT or 64378 instead of 64738. The Proofreader is sensitive to the position of each character within the line and thus catches transposition errors.

The Proofreader does *not* accept keyword abbreviations (for example, ? instead of PRINT). If you prefer to use abbreviations, you can still check the line by LISTing it after typing it in, moving the cursor back to the line, and

pressing RETURN. LISTing the line substitutes the full keyword for the abbreviation and allows the Proofreader to work properly. The same technique works for rechecking programs you've already typed in.

If you're using the Proofreader on the Commodore 128, Plus/4, or 16, do not perform any GRAPHIC commands while the Proofreader is active. When you perform a command like GRAPHIC 1, the computer moves everything at the start of BASIC program space—including the Proofreader—to another memory area, causing the Proofreader to crash. The same thing happens if you run any program with a GRAPHIC command while the Proofreader is in memory.

Though the Proofreader doesn't interfere with other BASIC operations, it's a good idea to disable it before running another program. However, the Proofreader is purposely difficult to dislodge: It's not affected by tape or disk operations, or by pressing RUN/STOP-RESTORE. The simplest way to disable it is to turn the computer off then on. A gentler method is to SYS to the computer's built-in reset routine (SYS 65341 for the 128, 64738 for the 64, 65526 for the Plus/4 and 16, and 64802 for the VIC). These reset routines erase any program in memory, so be sure to save the program you're typing in before entering the SYS command.

If you own a Commodore 64, you may already have wondered whether the Proofreader works with other programming utilities like "MetaBASIC." The answer is generally yes, if you're using a 64 and activate the Proofreader after installing the other utility. For example, first load and activate MetaBASIC, then load and run the Proofreader.

When using the Proofreader with another utility, you should disable both programs before running a BASIC program. While the Proofreader seems unaffected by most utilities, there's no way to promise that it will work with any and every combination of utilities you might want to use. The more utilities activated, the more fragile the system becomes.

The New Automatic Proofreader

```
10 VEC=PEEK(772)+256*PEEK(773)
   :LO=43:HI=44
```

```
20 PRINT "AUTOMATIC PROOFREADER FOR ";IF VEC=42364 THEN
   {SPACE}PRINT "C-64"
30 IF VEC=50556 THEN PRINT "VIC-20"
40 IF VEC=35158 THEN GRAPHIC CLR:PRINT "PLUS/4 & 16"
50 IF VEC=17165 THEN LO=45:HI=46:GRAPHIC CLR:PRINT "128"
60 SA=(PEEK(LO)+256*PEEK(HI))+6:ADR=SA
70 FOR J=0 TO 166:READ BYT:POKE ADR,BYT:ADR=ADR+1:CHK=CHK+BYT:NEXT
80 IF CHK<>20570 THEN PRINT "**ERROR* CHECK TYPING IN DATA STATEMENTS":END
90 FOR J=1 TO 5:READ RF,LF,HF:RS=SA+RF:HB=INT(RS/256):LB=RS-(256*HB)
100 CHK=CHK+RF+LF+HF:POKE SA+LF,LF:POKE SA+HF,HB:NEXT
110 IF CHK<>22054 THEN PRINT "**ERROR* RELOAD PROGRAM AND {SPACE}CHECK FINAL LINE":END
120 POKE SA+149,PEEK(772):POKE SA+150,PEEK(773)
130 IF VEC=17165 THEN POKE SA+14,22:POKE SA+18,23:POKE SA+29,224:POKE SA+139,224
140 PRINT CHR$(147);CHR$(17);"PROOFREADER ACTIVE":SYS SA
150 POKE HI,PEEK(HI)+1:POKE (PEEK(LO)+256*PEEK(HI))-1,0:N
   EW
160 DATA 120,169,73,141,4,3,16
   9,3,141,5,3
170 DATA 88,96,165,20,133,167,
   165,21,133,168,169
180 DATA 0,141,0,255,162,31,18
   1,199,157,227,3
190 DATA 202,16,248,169,19,32,
   210,255,169,18,32
200 DATA 210,255,160,0,132,180
   ,132,176,136,230,180
210 DATA 200,185,0,2,240,46,20
   1,34,208,8,72
220 DATA 165,176,73,255,133,17
   6,104,72,201,32,208
230 DATA 7,165,176,208,3,104,2
   08,226,104,166,180
240 DATA 24,165,167,121,0,2,13
   3,167,165,168,105
250 DATA 0,133,168,202,208,239
   ,240,202,165,167,69
260 DATA 168,72,41,15,168,185,
   211,3,32,210,255
270 DATA 104,74,74,74,168,1
   85,211,3,32,210
280 DATA 255,162,31,189,227,3,
   149,199,202,16,248
290 DATA 169,146,32,210,255,76
   ,86,137,65,66,67
300 DATA 68,69,70,71,72,74,75,
   77,80,81,82,83,88
310 DATA 13,2,7,167,31,32,151,
   116,117,151,128,129,167,136
   ,137
```


MLX Machine Language Entry Program For Commodore 64 and 128

Ottis R. Cowper, Technical Editor

"MLX" is a labor-saving utility that allows almost fail-safe entry of machine language programs. Included are versions for the Commodore 64 and 128.

Type in and save some copies of whichever version of MLX is appropriate for your computer (you'll want to use it to enter future ML programs from COMPUTE!'s GAZETTE). Program 1 is for the Commodore 64, and Program 2 is for the 128 (128 MLX can also be used to enter Commodore 64 ML programs for use in 64 mode). When you're ready to enter an ML program, load and run MLX. It asks you for a starting address and an ending address. These addresses appear in the article accompanying the MLX-format program listing you're typing.

If you're unfamiliar with machine language, the addresses (and all other values you enter in MLX) may appear strange. Instead of the usual decimal numbers you're accustomed to, these numbers are in *hexadecimal*—a base 16 numbering system commonly used by ML programmers. Hexadecimal—hex for short—includes the numerals 0-9 and the letters A-F. But don't worry—even if you know nothing about ML or hex, you should have no trouble using MLX.

After you enter the starting and ending addresses, you'll be offered the option of clearing the workspace. Choose this option if you're starting to enter a new listing. If you're continuing a listing that's partially typed from a previous session, don't choose this option.

A functions menu will appear. The first option in the menu is ENTER DATA. If you're just starting to type in a program, pick this. Press the E key, and type the first number in the first line of the program listing. If you've already typed in part of a program, type the line number where you left off typing at the end of the previous session (be sure to load the partially completed program before you resume entry). In any case, make sure the address you enter corresponds to the address of a line in the listing you are entering. Otherwise, you'll be unable to enter the data correctly. If you pressed E by mistake, you can return to the command menu by pressing RETURN alone when asked for the address. (You can get back to the menu from most options by pressing RETURN with no other input.)

Entering A Listing

Once you're in Enter mode, MLX prints the address for each program line for you. You then type in all nine numbers on that line, beginning with the first two-digit number after the colon (:). Each line represents eight data bytes and a checksum. Although an MLX-format listing appears similar to the "hex dump" listings from a machine language monitor program, the extra checksum number on the end allows MLX to check your typing. (Commodore 128 users *can* enter the data from an MLX listing using the built-in monitor if the rightmost column of data is omitted, but we recommend against it. It's much easier to let MLX do the proof-reading and error checking for you.)

When you enter a line, MLX recalculates the checksum from the eight bytes and the address and compares this value to the number from the ninth column. If the values match, you'll hear a bell tone, the data will be added to the workspace area, and the prompt for the next line of data will appear. But if MLX detects a typing error, you'll hear a low buzz and see an error message. The line will then be redisplayed for editing.

Invalid Characters Banned

Only a few keys are active while you're entering data, so you may have to unlearn some habits. You *do not* type spaces between the columns; MLX automatically inserts these for you. You *do not* press RETURN after typing the last number in a line; MLX automatically enters and checks the line after you type the last digit.

Only the numerals 0-9 and the letters A-F can be typed in. If you press any other key (with some exceptions noted below), you'll hear a warning buzz. To simplify typing, 128 MLX redefines the function keys and + and - keys on the numeric keypad so that you can enter data one-handed. (The 64 version incorporates the keypad modification from the March 1986 "Bug-Swatter" column, lines 485-487.) In either case, the keypad is active only while entering data. Addresses must be entered with the normal letter and number keys. The figures below show the keypad configurations for each version.

MLX checks for transposed characters. If you're supposed to type in A0 and instead enter 0A, MLX will catch your mistake. There is one error that

64 MLX Keypad

7	8	9	0
4 U	5 I	6 O	F P
1 J	2 K	3 L	E :
A M	B ,	C .	D /
0 Space			

128 MLX Keypad

A (F1)	B (F3)	C (F5)	D (F7)
7	8	9	E (+)
4	5	6	F (-)
1	2	3	E N T E R
0	.		

can slip past MLX: Because of the checksum formula used, MLX won't notice if you accidentally type FF in place of 00, and vice versa. And there's a very slim chance that you could garble a line and still end up with a combination of characters that adds up to the proper checksum. However, these mistakes should not occur if you take reasonable care while entering data.

Editing Features

To correct typing mistakes before finishing a line, use the INST/DEL key to delete the character to the left of the cursor. (The cursor-left key also deletes.) If you mess up a line really badly, press CLR/HOME to start the line over. The RETURN key is also active, but only before any data is typed on a line. Pressing RETURN at this point returns you to the command menu. After you type a character of data, MLX disables RETURN until the cursor returns to the start of a line. Remember, you can press CLR/HOME to quickly get to a line

number prompt.

More editing features are available when correcting lines in which MLX has detected an error. To make corrections in a line that MLX has redisplayed for editing, compare the line on the screen with the one printed in the listing, then move the cursor to the mistake and type the correct key. The cursor left and right keys provide the normal cursor controls. (The INST/DEL key now works as an alternative cursor-left key.) You cannot move left beyond the first character in the line. If you try to move beyond the rightmost character, you'll reenter the line. During editing, RETURN is active; pressing it tells MLX to recheck the line. You can press the CLR/HOME key to clear the entire line if you want to start from scratch, or if you want to get to a line number prompt to use RETURN to get back to the menu.

Display Data

The second menu choice, DISPLAY DATA, examines memory and shows the contents in the same format as the program listing (including the checksum). When you press D, MLX asks you for a starting address. Be sure that the starting address you give corresponds to a line number in the listing. Otherwise, the checksum display will be meaningless. MLX displays program lines until it reaches the end of the program, at which point the menu is redisplayed. You can pause the display by pressing the space bar. (MLX finishes printing the current line before halting.) Press space again to restart the display. To break out of the display and get back to the menu before the ending address is reached, press RETURN.

Other Menu Options

Two more menu selections let you save programs and load them back into the computer. These are SAVE FILE and LOAD FILE; their operation is quite straightforward. When you press S or L, MLX asks you for the filename. You'll then be asked to press either D or T to select disk or tape.

You'll notice the disk drive starting and stopping several times during a load or save (save only for the 128 version). Don't panic; this is normal behavior. MLX opens and reads from or writes to the file instead of using the usual LOAD and SAVE commands (128 MLX makes use of BLOAD). Disk users should also note that the drive prefix 0: is automatically added to the filename (line 750 in 64 MLX), so this should not be included when entering the name. This also precludes the use of @ for Save-with-Replace, so remember to give each version you save a different

name. The 128 version makes up for this by giving you the option of scratching the existing file if you want to reuse a filename.

Remember that MLX saves the entire workspace area from the starting address to the ending address, so the save or load may take longer than you might expect if you've entered only a small amount of data from a long listing. When saving a partially completed listing, make sure to note the address where you stopped typing so you'll know where to resume entry when you reload.

MLX reports the standard disk or tape error messages if any problems are detected during the save or load. (Tape users should bear in mind that Commodore computers are never able to detect errors during a save to tape.) MLX also has three special load error messages: INCORRECT STARTING ADDRESS, which means the file you're trying to load does not have the starting address you specified when you ran MLX; LOAD ENDED AT address, which means the file you're trying to load ends before the ending address you specified when you started MLX; and TRUNCATED AT ENDING ADDRESS, which means the file you're trying to load extends beyond the ending address you specified when you started MLX. If you see one of these messages and feel certain that you've loaded the right file, exit and rerun MLX, being careful to enter the correct starting and ending addresses.

The 128 version also has a CATALOG DISK option so you can view the contents of the disk directory before saving or loading.

The QUIT menu option has the obvious effect—it stops MLX and enters BASIC. The RUN/STOP key is disabled, so the Q option lets you exit the program without turning off the computer. (Of course, RUN/STOP-RESET also gets you out.) You'll be asked for verification; press Y to exit to BASIC, or any other key to return to the menu. After quitting, you can type RUN again and reenter MLX without losing your data, as long as you don't use the clear workspace option.

The Finished Product

When you've finished typing all the data for an ML program and saved your work, you're ready to see the results. The instructions for loading and using the finished product vary from program to program. Some ML programs are designed to be loaded and run like BASIC programs, so all you need to type is LOAD "filename",8 for disk (DLOAD "filename" on the 128) or LOAD "filename" for tape, and then RUN. Such

programs will usually have a starting address of 0801 for the 64 or 1C01 for the 128. Other programs must be reloaded to specific addresses with a command such as LOAD "filename",8,1 for disk (BLOAD "filename" on the 128) or LOAD "filename",1,1 for tape, then started with a SYS to a particular memory address. On the Commodore 64, the most common starting address for such programs is 49152, which corresponds to MLX address C000. In either case, you should always refer to the article which accompanies the ML listing for information on loading and running the program.

An Ounce Of Prevention

By the time you finish typing in the data for a long ML program, you may have several hours invested in the project. Don't take chances—use our "Automatic Proofreader" to type the new MLX, and then test your copy thoroughly before first using it to enter any significant amount of data. Make sure all the menu options work as they should. Enter fragments of the program starting at several different addresses, then use the Display option to verify that the data has been entered correctly. And be sure to test the Save and Load options several times to ensure that you can recall your work from disk or tape. Don't let a simple typing error in the new MLX cost you several nights of hard work.

Program 1: MLX For Commodore 64

```
SS 10 REM VERSION 1.1: LINES 8
30,950 MODIFIED, LINES 4
85-487 ADDED
EK 100 POKE 56,50:CLR:DIM IN$,
I,J,A,B,A$,B$,A(7),N$
DM 110 C4=48:C6=16:C7=7:Z2=2:Z
4=254:Z5=255:Z6=256:Z7=
127
CJ 120 FA=PEEK(45)+Z6*PEEK(46)
:BS=PEEK(55)+Z6*PEEK(56)
:H$="0123456789ABCDEF"
SB 130 R$=CHR$(13):L$="{LEFT}"
:S$=" " :D$=CHR$(20):Z$=
CHR$(0):T$="{13 RIGHT}"
CQ 140 SD=54272:FOR I=SD TO SD
+23:POKE I,0:NEXT:POKE
[SPACE]SD+24,15:POKE 78
8,52
FC 150 PRINT"[CLR]"CHR$(142)CH
R$(8):POKE 53280,15:POK
E 53281,15
EJ 160 PRINT T$ "[RED] [RVS]
[2 SPACES]{8 @}
[2 SPACES]"SPC(28)"
[2 SPACES]{OFF}[BLU] ML
X 11 [RED] [RVS]
[2 SPACES]"SPC(28)"
[12 SPACES][BLU]"
FR 170 PRINT"[3 DOWN]
[3 SPACES]COMPUTE!'S MA
CHINE LANGUAGE EDITOR
[3 DOWN]"
JB 180 PRINT"[BLK]STARTING ADD
```



```

RESS[43]";:GOSUB300:SA=A
D:GOSUB1040:IF F THEN18
0
GF 190 PRINT"[BLK]{2 SPACES}EN
DING ADDRESS[43]";:GOSUB
300:EA=AD:GOSUB1030:IF
[SPACE]F THEN190
KR 200 INPUT"[3 DOWN]{BLK}CLEA
R WORKSPACE [Y/N][43]";A
$:IF LEFT$(A$,1)<>"Y"TH
EN220
PG 210 PRINT"[2 DOWN]{BLU}WORK
ING...";:FORI=BS TO BS+
EA-SA+7:POKE I,0:NEXT:P
RINT"DONE"
DR 220 PRINTTAB(10)"[2 DOWN]
{BLK}{RVS} MLX COMMAND
[SPACE]MENU [DOWN][43]";
PRINT T$"[RVS]E[OFF]NTE
R DATA"
BD 230 PRINT T$"[RVS]D[OFF]ISP
LAY DATA":PRINT T$
[RVS]L[OFF]LOAD FILE"
JS 240 PRINT T$"[RVS]S[OFF]AVE
FILE":PRINT T$"[RVS]Q
[OFF]UIT[2 DOWN]{BLK}"
JH 250 GET A$:IF A$=N$ THEN250
HK 260 A=0:FOR I=1 TO 5:IF A$=
MID$( "EDLSQ",I,1)THEN A
=I:I=5
FD 270 NEXT:ON A GOTO420,610,6
90,700,280:GOSUB1060:GO
TO250
EJ 280 PRINT"[RVS] QUIT ":INPU
T"[DOWN][43]ARE YOU SURE
[Y/N]";A$:IF LEFT$(A$,
1)<>"Y"THEN220
EM 290 POKE SD+24,0:END
JX 300 IN$=N$:AD=0:INPUTIN$:IF
LEN(IN$)<>4THENRETURN
KF 310 BS=IN$:GOSUB320:AD=A:BS
=MID$(IN$,3):GOSUB320:A
D=AD*256+A:RETURN
PP 320 A=0:FOR J=1 TO 2:A$=MID
$(BS,J,1):B=ASC(A$)-C4+
(A$="0"):C7:A=A*C6+B
JA 330 IF B<0 OR B>15 THEN AD=
0:A=-1:J=2
GX 340 NEXT:RETURN
CH 350 B=INT(A/C6):PRINT MID$(
H$,B+1,1):B=A-B*C6:PRI
NT MID$(H$,B+1,1):RETU
RN
RR 360 A=INT(AD/Z6):GOSUB350:A
=AD-A*Z6:GOSUB350:PRINT
":
BE 370 CK=INT(AD/Z6):CK=AD-Z4*
CK+Z5*(CK>Z7):GOTO390
PX 380 CK=CK*Z2+Z5*(CK>Z7)+A
JC 390 CK=CK+Z5*(CK>Z5):RETURN
QS 400 PRINT"[DOWN]STARTING AT
[43]";:GOSUB300:IF IN$<>
N$ THEN GOSUB1030:IF F
[SPACE]THEN400
EX 410 RETURN
HD 420 PRINT"[RVS] ENTER DATA
[SPACE]";:GOSUB400:IF IN
$=N$ THEN220
JK 430 OPEN3,3:PRINT
SK 440 POKE198,0:GOSUB360:IF F
THEN PRINT IN$:PRINT"
[UP][5 RIGHT]";
GC 450 FOR I=0 TO 24 STEP 3:BS
=SS:FOR J=1 TO 2:IF F T
HEN BS=MID$(IN$,I+J,1)
HA 460 PRINT"[RVS]"BSL$;IF I<
24THEN PRINT"[OFF]";
HD 470 GET A$:IF A$=N$ THEN470
FK 480 IF (A$>"/"AND A$<"")OR(A
$>"@")AND A$<"G")THEN540
GS 485 A=-(A$="M")-2*(A$=",")-
3*(A$=".")-4*(A$="/")-5
*(A$="J")-6*(A$="K")
FX 486 A=A-7*(A$="L")-8*(A$=":
")-9*(A$="U")-10*(A$="I
")-11*(A$="O")-12*(A$="
P")
CM 487 A=A-13*(A$=SS):IF A THE
N A$=MID$( "ABCD123456F
0",A,1):GOTO 540
MP 490 IF A$=R$ AND((I=0)AND(J
=1)OR F)THEN PRINT BS;:
J=2:NEXT:I=24:GOTO550
KC 500 IF A$="HOME" THEN PRI
NT BS:J=2:NEXT:I=24:NEX
T:F=0:GOTO440
MX 510 IF (A$="RIGHT")AND F TH
ENPRINT BSL$;GOTO540
GK 520 IF A$<>L$ AND A$<>D$ OR
((I=0)AND(J=1))THEN GOS
UB1060:GOTO470
HG 530 A$=L$+S$+L$:PRINT BSL$;
J=2-J:IF J THEN PRINT
[SPACE]L$;I=I-3
QS 540 PRINT A$;NEXT J:PRINT
[SPACE]S$;
PM 550 NEXT I:PRINT"PRINT"[UP]
[5 RIGHT]";:INPUT#3,IN$
:IF IN$=N$ THEN CLOSE3:
GOTO220
QC 560 FOR I=1 TO 25 STEP3:BS=
MID$(IN$,I):GOSUB320:IF
I<25 THEN GOSUB380:A(I
/3)=A
PK 570 NEXT:IF A<>CK THEN GOSU
B1060:PRINT"[BLK]{RVS}
[SPACE]ERROR: REENTER L
INE [43]";F=1:GOTO440
HJ 580 GOSUB1080:B=BS+AD-SA:FO
R I=0 TO 7:POKE B+I,A(I
):NEXT
QQ 590 AD=AD+8:IF AD>EA THEN C
LOSE3:PRINT"[DOWN]{BLU}
** END OF ENTRY **[BLK]
[2 DOWN]";GOTO700
GQ 600 F=0:GOTO440
QA 610 PRINT"[CLR]{DOWN}{RVS}
[SPACE]DISPLAY DATA ":G
OSUB400:IF IN$=N$ THEN2
20
RJ 620 PRINT"[DOWN]{BLU}PRESS:
[RVS]SPACE[OFF] TO PAU
SE, [RVS]RETURN[OFF] TO
BREAK[43]{DOWN}"
KS 630 GOSUB360:B=BS+AD-SA:FOR
I=BTO B+7:A=PEEK(I):GOS
UB350:GOSUB380:PRINT S$
;
CC 640 NEXT:PRINT"[RVS]";:A=CK
:GOSUB350:PRINT
KH 650 F=1:AD=AD+8:IF AD>EA TH
ENPRINT"[DOWN]{BLU}** E
ND OF DATA **":GOTO220
KC 660 GET A$:IF A$=R$ THEN GO
SUB1080:GOTO220
EQ 670 IF A$=SS THEN F=F+1:GOS
UB1080
AD 680 ONFGOTO630,660,630
CM 690 PRINT"[DOWN]{RVS} LOAD
[SPACE]DATA ":OP=1:GOTO
710
PC 700 PRINT"[DOWN]{RVS} SAVE
[SPACE]FILE ":OP=0
RX 710 IN$=N$:INPUT"[DOWN]FILE
NAME[43]";IN$:IF IN$=N$
[SPACE]THEN220
PR 720 F=0:PRINT"[DOWN]{BLK}
[RVS]T[OFF]APE OR [RVS]
D[OFF]ISK: [43]";
FP 730 GET A$:IF A$="T"THEN PR
INT"PRINT"[DOWN]";:GOTO880
HQ 740 IF A$<>"D"THEN730
HH 750 PRINT"D[DOWN]";:OPEN15,8
,15,"I0":B=EA-SA:IN$="
0":+IN$:IF OP THEN810
SQ 760 OPEN 1,8,8,IN$+"P,W":G
OSUB860:IF A THEN220
FJ 770 AH=INT(SA/256):AL=SA-(A
H*256):PRINT#1,CHR$(AL)
;CHR$(AH);
PE 780 FOR I=0 TO B:PRINT#1,CH
R$(PEEK(BS+I));:IF ST T
HEN800
FC 790 NEXT:CLOSE1:CLOSE15:GOT
O940
GS 800 GOSUB1060:PRINT"[DOWN]
{BLK}ERROR DURING SAVE:
[43]";:GOSUB860:GOTO220
MA 810 OPEN 1,8,8,IN$+"P,R":G
OSUB860:IF A THEN220
GE 820 GET#1,A$,B$:AD=ASC(A$+Z
$)+256*ASC(B$+Z$):IF AD
<>SA THEN F=1:GOTO850
RX 830 FOR I=0 TO B:GET#1,A$:P
OKE BS+I,ASC(A$+Z$):IF(I
<>B)AND ST THEN F=2:AD
=I:I=B
FA 840 NEXT:IF ST<>64 THEN F=3
FQ 850 CLOSE1:CLOSE15:ON ABS(F
>0)+1 GOTO960,970
SA 860 INPUT#15,A,A$:IF A THEN
CLOSE1:CLOSE15:GOSUB10
60:PRINT"[RVS]ERROR: "A
$
GQ 870 RETURN
EJ 880 POKE183,PEEK(FA+2):POKE
187,PEEK(FA+3):POKE188,
PEEK(FA+4):IFOP=0THEN92
0
HJ 890 SYS 63466:IF(PEEK(783)A
ND1)THEN GOSUB1060:PRIN
T"[DOWN]{RVS} FILE NOT
[SPACE]FOUND ":GOTO690
CS 900 AD=PEEK(829)+256*PEEK(8
30):IF AD<>SA THEN F=1:
GOTO970
SC 910 A=PEEK(831)+256*PEEK(83
2)-1:F=F-2*(A<EA)-3*(A>
EA):AD=A-AD:GOTO930
KM 920 A=SA:B=EA+1:GOSUB1010:P
OKE780,3:SYS 63338
JF 930 A=BS:B=BS+(EA-SA)+1:GOS
UB1010:ON OP GOTO950:SY
S 63591
AE 940 GOSUB1080:PRINT"[BLU]**
SAVE COMPLETED **":GOT
O220
XP 950 POKE147,0:SYS 63562:IF
[SPACE]ST=0 THEN970
FR 960 GOSUB1080:PRINT"[BLU]**
LOAD COMPLETED **":GOT
O220
DP 970 GOSUB1060:PRINT"[BLK]
[RVS]ERROR DURING LOAD:
[DOWN][43]";:ON F GOSUB98
0,990,1000:GOTO220
PP 980 PRINT"INCORRECT STARTIN
G ADDRESS ("":GOSUB360:
PRINT")":RETURN
GR 990 PRINT"LOAD ENDED AT "":
AD=SA+AD:GOSUB360:PRINT
D$:RETURN
FD 1000 PRINT"TRUNCATED AT END
ING ADDRESS":RETURN
RX 1010 AH=INT(A/256):AL=A-(AH
*256):POKE193,AL:POKE1
94,AH
FF 1020 AH=INT(B/256):AL=B-(AH
*256):POKE174,AL:POKE1
75,AH:RETURN
FX 1030 IF AD<SA OR AD>EA THEN
1050
HA 1040 IF(AD>511 AND AD<40960

```



```

)OR(AD>49151 AND AD<53
248) THEN GOSUB 1080:F=0
:RETURN
HC 1050 GOSUB 1060:PRINT"[RVS]
[SPACE]INVALID ADDRESS
[DOWN][BLK]":F=1:RETU
RN
AR 1060 POKE SD+5,31:POKE SD+6
,208:POKE SD,240:POKE
[SPACE]SD+1,4:POKE SD+
4,33
DX 1070 FOR S=1 TO 100:NEXT:GO
TO 1090
PF 1080 POKE SD+5,8:POKE SD+6,
240:POKE SD,0:POKE SD+
1,90:POKE SD+4,17
AC 1090 FOR S=1 TO 100:NEXT:PO
KE SD+4,0:POKE SD,0:PO
KE SD+1,0:RETURN

```

Program 2: MLX For Commodore 128

```

AE 100 TRAP 960:POKE 4627,128:
DIM NL$,A(7)
XP 110 Z2=2:Z4=254:Z5=255:Z6=2
56:Z7=127:BS=256*PEEK(4
627):EA=65280
FB 120 BE$=CHR$(7):RT$=CHR$(13
):DL$=CHR$(20):SP$=CHR$
(32):LF$=CHR$(157)
KE 130 DEF FNHB(A)=INT(A/256):
DEF FNLB(A)=A-FNHB(A)*2
56:DEF FNAD(A)=PEEK(A)+
256*PEEK(A+1)
JB 140 KEY 1,"A":KEY 3,"B":KEY
5,"C":KEY 7,"D":VOL 15
:IF RGR(0)=5 THEN FAST
FJ 150 PRINT"[CLR]"CHR$(142):C
HR$(8):COLOR 0,15:COLOR
4,15:COLOR 6,15
GQ 160 PRINT TAB(12)"[RED]
[RVS][2 SPACES][9 @]
[2 SPACES]"RT$:TAB(12)"
[RVS][2 SPACES][OFF]
[BLU] 128 MLX [RED]
[RVS][2 SPACES]"RT$:TAB
(12)"[RVS][13 SPACES]
[BLU]"
FE 170 PRINT"[2 DOWN]
[3 SPACES]COMPUTE!'S MA
CHINE LANGUAGE EDITOR
[2 DOWN]"
DK 180 PRINT"[BLK]STARTING ADD
RESS[43]":GOSUB 260:IF
[SPACE]AD THEN SA=AD:EL
SE 180
FH 190 PRINT"[BLK][2 SPACES]EN
DING ADDRESS[43]":GOSUB
260:IF AD THEN EA=AD:EL
SE 190
MF 200 PRINT"[DOWN][BLK]CLEAR
[SPACE]WORKSPACE [Y/N]?
[43]:GETKEY AS:IF AS<>"
Y" THEN 220
QH 210 PRINT"[DOWN][BLU]WORKIN
G...":BANK 0:FOR A=BS
[SPACE]TO BS+(EA-SA)+7:
POKE A,0:NEXT A:PRINT"D
ONE"
DC 220 PRINT TAB(10)"[DOWN]
[BLK][RVS] MLX COMMAND
[SPACE]MENU [43][DOWN]":
PRINT TAB(13)"[RVS]E
[OFF]INTER DATA"RT$:TAB(
13)"[RVS]D[OFF]ISPLAY D
ATA"RT$:TAB(13)"[RVS]L
[OFF]OAD FILE"
HB 230 PRINT TAB(13)"[RVS]S

```

```

[OFF]AVE FILE"RT$:TAB(1
3)"[RVS]C[OFF]ATALOG DI
SK"RT$:TAB(13)"[RVS]Q
[OFF]UIT[DOWN][BLK]"
AP 240 GETKEY AS:A=INSTR("EDLS
CQ",AS):ON A GOTO 340,5
50,640,650,930,940:GOSU
B 950:GOTO 240
SX 250 PRINT"STARTING AT":GOS
UB 260:IF(AD<0)OR(AS=N
L$)THEN RETURN:ELSE 250
BG 260 AS=NL$:INPUT AS:IF LEN(
AS)=4 THEN AD=DEC(AS)
PP 270 IF AD=0 THEN BEGIN:IF A
S<>NL$ THEN 300:ELSE RE
TURN:BEND
MA 280 IF AD<SA OR AD>EA THEN
[SPACE]300
PM 290 IF AD>511 AND AD<65280
[SPACE]THEN PRINT BE$::
RETURN
SQ 300 GOSUB 950:PRINT"[RVS] I
NVALID ADDRESS [DOWN]
[BLK]":AD=0:RETURN
RD 310 CK=FNHB(AD):CK=AD-Z4*CK
+Z5*(CK>Z7):GOTO 330
DD 320 CK=CK*Z2+Z5*(CK>Z7)+A
AH 330 CK=CK+Z5*(CK>Z5):RETURN
QD 340 PRINT BE$:"[RVS] ENTER
[SPACE]DATA ":GOSUB 250
:IF AS=NL$ THEN 220
JA 350 BANK 0:PRINT:F=0:OPEN 3
,3
BR 360 GOSUB 310:PRINT HEX$(AD
)+"":IF F THEN PRINT
[SPACE]L$:PRINT"[UP]
[5 RIGHT]";
QA 370 FOR I=0 TO 24 STEP 3:BS
=SP$:FOR J=1 TO 2:IF F
[SPACE]THEN BS=MID$(L$,
I+J,1)
PS 380 PRINT"[RVS]"BS+LF$:IF
[SPACE]I<24 THEN PRINT"
[OFF]";
RC 390 GETKEY AS:IF (AS>"/" AN
D AS<":") OR(AS>"@ AND
AS<"G") THEN 470
AC 400 IF AS="+" THEN AS="E":G
OTO 470
QB 410 IF AS="-" THEN AS="F":G
OTO 470
FB 420 IF AS=RT$ AND ((I=0) AN
D (J=1) OR F) THEN PRIN
T BS::J=2:NEXT I=24:GOT
O 480
RD 430 IF AS="[HOME]" THEN PRI
NT BS::J=2:NEXT I=24:NEX
T:F=0:GOTO 360
XB 440 IF (AS="[RIGHT]") AND F
THEN PRINT BS+LF$:GOT
O 470
JP 450 IF AS<>LF$ AND AS<>DL$
[SPACE]OR ((I=0) AND (J
=1)) THEN GOSUB 950:GOT
O 390
PS 460 AS=LF$+SP$+LF$:PRINT BS
+LF$:J=2-J:IF J THEN P
RINT LF$:I=I-3
GB 470 PRINT AS::NEXT J:PRINT
[SPACE]SP$:
HA 480 NEXT I:PRINT:PRINT"[UP]
[5 RIGHT]":L$="
[27 SPACES]"
DP 490 FOR I=1 TO 25 STEP 3:GE
T#3,AS,B$:IF AS=SP$ THE
N I=25:NEXT:CLOSE 3:GOT
O 220
BA 500 AS=AS+BS:A=DEC(AS):MID$(
L$,I,2)=AS:IF I<25 THE
N GOSUB 320:A(I/3)=A:GE
T#3,AS

```

```

AR 510 NEXT I:IF A<>CK THEN GO
SUB 950:PRINT:PRINT"
[RVS] ERROR: REENTER LI
NE ":F=1:GOTO 360
DX 520 PRINT BE$:B=BS+AD-SA:FO
R I=0 TO 7:POKE B+I,A(I
):NEXT I
XB 530 F=0:AD=AD+8:IF AD<=EA T
HEN 360
CA 540 CLOSE 3:PRINT"[DOWN]
[BLU]** END OF ENTRY **
[BLK][2 DOWN]":GOTO 650
MC 550 PRINT BE$:"[CLR][DOWN]
[RVS] DISPLAY DATA ":GO
SUB 250:IF AS=NL$ THEN
[SPACE]220
JF 560 BANK 0:PRINT"[DOWN]
[BLU]PRESS: [RVS]SPACE
[OFF] TO PAUSE, [RVS]RE
TURN[OFF] TO BREAK[43]
[DOWN]"
XA 570 PRINT HEX$(AD)+"":GOS
UB 310:B=BS+AD-SA
DJ 580 FOR I=B TO B+7:A=PEEK(I
):PRINT RIGHT$(HEX$(A),
2):SP$:GOSUB 320:NEXT
[SPACE]I
XB 590 PRINT"[RVS]";RIGHT$(HEX
$(CK),2)
GR 600 F=1:AD=AD+8:IF AD>EA TH
EN PRINT"[BLU]** END OF
DATA **":GOTO 220
EB 610 GET AS:IF AS=RT$ THEN P
RINT BE$:GOTO 220
QK 620 IF AS=SP$ THEN F=F+1:PR
INT BE$:
XS 630 ON F GOTO 570,610,570
RF 640 PRINT BE$"[DOWN][RVS] L
OAD DATA ":OP=1:GOTO 66
0
BP 650 PRINT BE$"[DOWN][RVS] S
AVE FILE ":OP=0
DM 660 F=0:F$=NL$:INPUT"FILENA
ME[43]":F$:IF F$=NL$ THE
N 220
RF 670 PRINT"[DOWN][BLK][RVS]T
[OFF]APE OR [RVS]D[OFF]
ISK: [43]";
SQ 680 GETKEY AS:IF AS="T" THE
N 850:ELSE IF AS<>"D" T
HEN 680
SP 690 PRINT"DISK[DOWN]":IF OP
THEN 760
EG 700 DOPEN#1,(F$+"P"),W:IF
[SPACE]DS THEN AS=DS$:G
OTO 740
JH 710 BANK 0:POKE BS-2,FNHB(S
A):POKE BS-1,FNHB(SA):P
RINT"SAVING ":F$:PRINT
FOR A=BS-2 TO BS+EA-SA:
PRINT#1,CHR$(PEEK(A)):
IF ST THEN AS="DISK WRI
TE ERROR":GOTO 750
GC 730 NEXT A:CLOSE 1:PRINT"
[BLU]** SAVE COMPLETED
[SPACE]WITHOUT ERRORS *
*":GOTO 220
RA 740 IF DS=63 THEN BEGIN:CLO
SE 1:INPUT"[BLK]REPLACE
EXISTING FILE [Y/N][43]
":AS:IF AS="Y" THEN SCR
ATCH(F$):PRINT:GOTO 700
:ELSE PRINT"[BLK]":GOTO
660:BEND
GA 750 CLOSE 1:GOSUB 950:PRINT
"[BLK][RVS] ERROR DURIN
G SAVE: [43]":PRINT AS:G
OTO 220
FD 760 DOPEN#1,(F$+"P"):IF DS
THEN AS=DS$:F=4:CLOSE
[SPACE]1:GOTO 790

```



```

PX 770 GET#1,A$,B$:CLOSE 1:AD=
ASC(A$)+256*ASC(B$):IF
[SPACE]AD<>SA THEN F=1:
GOTO 790
KB 780 PRINT"LOADING ";F$:PRIN
T:BLOAD(F$),B$,P(B$):AD
=SA+FNAD(174)-BS-1:F=-2
*(AD<EA)-3*(AD>EA)
RQ 790 IF F THEN 800:ELSE PRIN
T"[BLU]** LOAD COMPLETE
D WITHOUT ERRORS ***:GO
TO 220
ER 800 GOSUB 950:PRINT"[BLK]
{RVS} ERROR DURING LOAD
: [43]":ON F GOSUB 810,8
20,830,840:GOTO220
QJ 810 PRINT"INCORRECT STARTIN
G ADDRESS ("HEX$(AD):"
)":RETURN
DP 820 PRINT"LOAD ENDED AT ";H
EX$(AD):RETURN
EB 830 PRINT"TRUNCATED AT ENDI
NG ADDRESS ("HEX$(EA)")
":RETURN
FP 840 PRINT"DISK ERROR ";A$:R
ETURN
KS 850 PRINT"TAPE":AD=POINTER(
F$):BANK 1:A=PEEK(AD):A
L=PEEK(AD+1):AH=PEEK(AD
+2)
XX 860 BANK 15:SYS DEC("FF68")
,0,1:SYS DEC("FFBA"),1,
1,0:SYS DEC("FFBD"),A,A
L,AH:SYS DEC("FF90"),12
8:IF OP THEN 890
FG 870 PRINT:A=SA:B=EA+1:GOSUB
920:SYS DEC("E919"),3:
PRINT"SAVING ";F$:
AB 880 A=BS:B=BS+(EA-SA)+1:GOS
UB 920:SYS DEC("EA18"):
PRINT"[DOWN]{BLU]** TAP
E SAVE COMPLETED ***:GO
TO 220
CP 890 SYS DEC("E99A"):PRINT:I
F PEEK(2816)=5 THEN GOS
UB 950:PRINT"[DOWN]
{BLK}{RVS} FILE NOT FOU
ND ":GOTO 220
GQ 900 PRINT"LOADING ...{DOWN}
":AD=FNAD(2817):IF AD<>
SA THEN F=1:GOTO 800:EL
SE AD=FNAD(2819)-1:F=-2
*(AD<EA)-3*(AD>EA)
JD 910 A=BS:B=BS+(EA-SA)+1:GOS
UB 920:SYS DEC("E9FB"):
IF ST>0 THEN 800:ELSE 7
90
XB 920 POKE193,FNLB(A):POKE194
,FNLB(A):POKE 174,FNLB(
B):POKE 175,FNLB(B):RET
URN
CP 930 CATALOG:PRINT"[DOWN]
{BLU]** PRESS ANY KEY F
OR MENU ***:GETKEY A$:G
OTO 220
MM 940 PRINT BE$"[RVS] QUIT
[43]":RT$: "ARE YOU SURE
[SPACE][Y/N]?:GETKEY A
$:IF A$<>"Y" THEN 220:E
LSE PRINT"[CLR]":BANK 1
5:END
JE 950 SOUND 1,500,10:RETURN
AF 960 IF ER=14 AND EL=260 THE
N RESUME 300
MK 970 IF ER=14 AND EL=500 THE
N RESUME NEXT
KJ 980 IF ER=4 AND EL=780 THEN
F=4:A$=D$:RESUME 800
DQ 990 IF ER=30 THEN RESUME:EL
SE PRINT ERR$(ER):" ERR
OR IN LINE":EL

```

Moon Rescue

Article on page 50.

```

AJ 10 GRAPHIC 1,1
FJ 20 COLOR4,12:COLOR0,1:COLOR
1,2:GRAPHIC0,1:FORI=1TO4
:MOVSPR I,0,0:NEXT
HS 30 CHAR1,14,8,"MOON RESCUE"
:CHAR1,10,15,"MAKE NEW R
OCKS (Y/N)"
FR 40 GETKEY A$:GRAPHIC1:FAST
AX 50 WIDTH2:DRAW 1,100,99TO10
0,104:DRAW1,220,99TO220,
104:WIDTH1:DRAW1,100,104
TO100,107TO102,107TO102,
104,104,102TO105,103,103
,101TO98,101,97,100TO97,
99
JM 60 DRAW1,219,104TO219,107,2
21,107TO221,104,224,101T
O225,99,223,101TO218,101
,217,102TO216,103
EM 70 CIRCLE1,21,21,0,8:BOX1,
14,26,28,29,0,1:PAINT1,2
1,21
ME 80 DRAW1,15,30TO15,31,13,32
TO17,32,27,28TO27,31,25,
32TO29,32
CG 90 BOX0,11,10,14,16,0,1:BOX
0,28,10,33,16,0,1:BOX0,1
8,15,24,21:BOX0,18,24,20
,26:BOX0,24,24,22,26
JA 100 DRAW0,15,17TO15,26,27,1
7TO27,26:WIDTH2:DRAW0,1
8,28TO17,29,23,28TO24,2
9
SA 110 DRAW0,12,21TO12,22,29,2
1TO29,22:WIDTH1
CP 120 SSHAPEM1$,97,99,106,107
:SSHAPEM2$,216,99,226,1
07:SSHAPE$,70,70,79,78
SSHAPE LP$,9,12,32,32
HP 140 SSHAPECS(1),9,10,22,32:
SSHAPECS(2),10,9,32,22
JR 150 GSHAPE$,97,99:GSHAPE$,
216,99:BOX0,9,12,32,32
,0,1
GE 160 IF A$<>"Y"THEN260
CG 170 FORW=1TO25:I=(INT(76*RN
D(W))+45):X=INT(19*RND(
W)+1)/2:Y=INT(20*RND(W)
+1)/2:A=INT(360*RND(W)+
1)
AB 180 CIRCLE1,100,100,X,Y,(36
0-A),W,I:NEXTW:SSHAPEA$,
88,90,111,110
RE 190 FORS=1TO4:SPRSVA$,S:SP
RITES,1,9,0,0,0,1:SPRCO
LOR1,11:NEXTS
CE 200 BOX0,88,90,111,110,0,1
BH 210 SCNCLR
SM 220 FORW=1TO15:X=INT(320*RN
D(1))+1:Y=INT(75*RND(1)
)+45:DRAW1,X,Y:NEXTW
EC 230 COLOR1,8:CIRCLE1,300,20
,15,15:PAINT1,300,20:BO
X1,155,0,165,6,0,1:COLO
R1,2:DRAW1,150,9TO160,1
TO170,9
EX 240 COLOR1,6:DRAW1,0,150TO4
0,150,40,150TO105,175,1
05,175TO215,175,215,175
TO280,150,280,150TO320,
150:WIDTH2:PAINT1,1,151
:WIDTH1
XG 250 PAINT 1,1,151:DRAW0,30,
200TO105,175:DRAW0,215,
175TO290,200
XD 260 COLOR1,2:CHAR1,15,24,"M

```

```

OON RESCUE":SLOW
SR 270 CHAR1,0,0,"SAVED: 0
{2 SPACES}LOST: 0{D}",1
CD 280 CHAR1,22,0,"{F$}SET:0
{3 SPACES}PROBE:0
{2 SPACES}",1
PC 290 ML=4:MK=0:MS=0:P=3:L=1:
S=0
XQ 300 FORS=1TO4:GOSUB740:MOVS
PRS,100,((S*21)+68):NEX
TS
HD 310 RESTORE:FORM=1TO4:READX
H(M),YH(M):NEXTM
DE 320 FORW=1TO4:M$(W,1)=M1$:M
$(W,2)=M2$:NEXTW:GOSUB4
50:GOSUB480
HC 330 B=0:D=0:SP=0:J=0:MO=0:S
PRSAV LP$,8
DG 340 MOVSPR8,173,58:SPRITE8,
1,4,0,0,0
ER 350 IFML<LANDMO=0ANDP>0THEN
ML=4:L=L+1:GOSUB440:P=P
+1:GOTO320
GE 360 GOSUB440:GOTO410
PG 370 IFSP<>1THEN410
HH 380 X=RSPP0S(8,0):IFX<24ORX
>318THEN660
BR 390 Y=RSPP0S(8,1):IFY<66ORY
>172THEN500
MB 400 B=BUMP(1):IFB>128ANDB<1
44THEN660
EJ 410 J=JOY(2):IFJ=0THENJ=D:E
LSEGOSUB720:IFJ=1ORJ=5T
HEND=J:SP=1
PA 420 MOVSPR8,((J-1)*45)#SP:F
ORW=1TO4:GSHAPEM$(W,M),
XH(W),YH(W):NEXTW:M=M+1
:GOSUB750:IFM>2THENM=1
JA 430 GOTO370
SM 440 CHAR1,6,0,STR$(MS),1:CH
AR1,15,0,STR$(MK),1:CHA
R1,27,0,STR$(L),1:CHAR1
,37,0,STR$(P),1:RETURN
RK 450 FORS=1TO4:D=90:SP=INT(4
*RND(1))+1
KK 460 IFINT(S/2)=S/2THEND=270
DF 470 MOVSPR8,D#SP:NEXTS:RETU
RN
KC 480 B=BUMP(1):IFB>0THEN480
FF 490 RETURN
KA 500 MOVSPR8,0#0:B=BUMP(1):I
FB>128ANDB<144THEN660
BG 510 IFY>172THEN560
QM 520 IFD=5THENMOVSPR8,0#1:GO
TO410
RD 530 IFX<160ORX>180THEN660
JS 540 GOSUB730:MOVSPR8,173,58
:SP=0:D=0:IFMO=1THENMS=
MS+1:MO=0:GOSUB480:GOSU
B740
RH 550 GOTO350
BG 560 IF X<53THEN A=1:GOTO620
MH 570 IF X>302THENA=4:GOTO620
MC 580 IF Y<200THENMOVSPR8,0#1
:GOTO410
GX 590 IF X>129ANDX<155THENA=2
:GOTO630
GK 600 IF X>181ANDX<213THENA=3
:GOTO630
HQ 610 GOTO660
MC 620 MOVSPR8,X,178:GOTO640
PA 630 MOVSPR8,X,202
CE 640 IFM$(A,1)<>E$ANDMO=0THE
NM$(A,1)=E$:M$(A,2)=E$:
MO=1:ML=ML-1:GOSUB740
RK 650 SLEEP1:GOSUB450:SP=0:D=
0:GOTO350
KF 660 GOSUB760:P=P-1:MOVSPR8,
0#0:SPRITE8,1,4,0,0,1,0
:IFMO=1THENMK=MK+1:MO=0

```



```
SK 670 IFML<1ANDMO=0ANDP>0THEN
ML=4:L=L+1:GOSUB440:P=P
+1:GOTO320
SS 680 GOSUB440:FORW=1TO4:SPRS
AVCS(W),8:NEXTW:SPRITES
,0:GOSUB480
GK 690 IFP>0THENGOSUB440:GOTO3
30
RX 700 FORS=1TO4:MOVSPRS,0#0:N
EXTS:SLEEP3:RUN20
CM 710 DATA 20,140,125,165,180
,165,300,140
QM 720 SOUND2,54630,(S+5),1,27
8,0,3,3119:RETURN
HX 730 SOUND1,6330,2,1,22376,1
6585,1,756:RETURN
MQ 740 SOUND3,25911,2,1,3043,3
640,0,3194:RETURN
SQ 750 SOUND1,885,(DU+2),1,120
48,8021,3,1427:DU=0:RET
URN
KR 760 DU=18:SOUND3,12000,10,2
,400,900,3:GOSUB750:RET
URN
```

Sprite Locator

Article on page 72.

```
PM 100 POKE 53280,6:POKE 53281
,6:PRINT"[CLR]{WHT}
{3 SPACES}READING DATA
SC 110 FOR I=832 TO 895:READ A
:POKE I,A:NEXT
RM 120 FOR I=49152 TO 49486:RE
AD A:POKE I,A:X=X+A:NEX
T
PE 130 IF X<>41606 THEN PRINT"
{CLR}{WHT}ERROR IN DATA
STATEMENTS.":STOP
MR 140 SYS 49152
HM 150 REM{2 SPACES}SPRITE CRO
SSHAIR DATA
JF 160 DATA 255,255,255,128,8,
1,128,8,1,128,8,1,128,8
,1,128
DH 170 DATA 8,1,128,8,1,128,8,
1,128,8,1,128,8,1,255,2
55,255,128,8,1
RA 180 DATA 128,8,1,128,8,1,12
8,8,1,128,8,1,128,8,1,1
28,8,1,128,8
CG 190 DATA 1,128,8,1,255,255,
255,0
PD 200 REM{2 SPACES}MAIN ROUTI
NE DATA
QD 210 DATA 32,17,193,169,1,13
3,255,32,44,193
SR 220 DATA 32,29,192,32,154,1
92,32,228,255,240
JP 230 DATA 242,169,0,160,21,1
53,0,208,96,173
XR 240 DATA 0,220,74,176,3,206
,1,208,74,176
EX 250 DATA 3,238,1,208,74,176
,38,173,0,208
QB 260 DATA 208,29,173,16,208,
41,1,208,14,173
AA 270 DATA 16,208,9,1,141,16,
208,169,80,141
AJ 280 DATA 0,208,96,173,16,20
8,41,254,141,16
PM 290 DATA 208,206,0,208,96,7
4,176,33,238,0
AF 300 DATA 208,240,52,169,80,
205,0,208,208,53
JM 310 DATA 173,16,208,41,1,24
0,46,173,16,208
PP 320 DATA 41,254,141,16,208,
169,0,141,0,208
```

```
BJ 330 DATA 96,74,176,29,162,1
12,160,255,32,48
AX 340 DATA 193,165,255,24,105
,1,201,16,48,2
SE 350 DATA 169,1,133,255,96,1
73,16,208,9,1
AK 360 DATA 141,16,208,96,160,
0,185,55,193,32
HG 370 DATA 210,255,200,192,3,
208,245,173,0,208
RP 380 DATA 32,203,192,185,55,
193,32,210,255,200
AK 390 DATA 192,6,208,245,173,
1,208,32,203,192
EF 400 DATA 185,55,193,32,210,
255,200,192,11,208
DD 410 DATA 245,165,255,141,66
,193,162,255,56,141
AM 420 DATA 66,193,233,100,232
,176,248,138,201,0
KB 430 DATA 208,6,32,12,193,76
,231,192,32,6
PC 440 DATA 193,173,66,193,162
,255,56,141,66,193
GF 450 DATA 233,10,232,176,248
,138,201,0,208,6
HA 460 DATA 32,12,193,76,3,193
,32,6,193,173
HK 470 DATA 66,193,24,105,48,7
6,210,255,169,48
QC 480 DATA 76,210,255,160,0,1
85,67,193,201,255
KR 490 DATA 240,12,170,200,185
,67,193,157,0,208
SS 500 DATA 200,76,19,193,169,
13,141,248,7,96
HQ 510 DATA 166,255,160,0,136,
208,253,202,208,250
BJ 520 DATA 96,19,88,61,32,89,
61,32,83,80,68,61,0,0
QP 530 DATA 120,1,120,16,0,21,
1,39,1,255,255,0,255,0,
255,0
```

Sprite Graph

Article on page 84.

```
SJ 10 PRINT"[CLR]{WHT}
{14 SPACES}SPRITE GRAPH
{2 DOWN}"
EJ 20 INPUT"HOW MANY GRAPHS":B
:F=1:IF B<1 THEN END
JS 30 OPEN3,4:PRINT#3,CHR$(14)
"{2 SPACES}SPRITE GRAPH"
:A=1:REM CHR$(14)-DOUBLE
WIDTH MODE
CS 40 FORI=1TO24:PRINT#3:PRINT
#3
EJ 50 PRINT#3,CHR$(15)"
{5 SPACES}1{7 SPACES}1
{7 SPACES}1":REM CHR$(15)
)-STANDARD CHAR MODE
FC 60 PRINT#3,CHR$(15)"
{5 SPACES}2631{4 SPACES}
2631{4 SPACES}2631"
FK 70 PRINT#3,CHR$(15)"
{5 SPACES}84268421842684
2184268421"CHR$(8):REM C
HR$(8)-BIT IMAGE
XS 80 PRINT#3,CHR$(15)"
{4 SPACES}{A}{E}{23 R}{E}{S}"C
HR$(8)
SF 90 PRINT#3,CHR$(15)A:" {EQ}+
+++++
EW"CHR$(8):A=A+1
SG 100 IF A>9 THEN 120
MR 110 GOTO 90
SJ 120 PRINT#3,CHR$(15)A:" {EQ}+
+++++
EW"CHR$(8):A=A+1
BC 130 IF A=21 THEN 150
```

```
MM 140 GOTO 120
HM 150 PRINT#3,CHR$(15)" 21
{E}{Z}{E}{X}"CHR$(8)
AF 160 PRINT#3:PRINT F:F=F+1
RG 170 IF F<B+1 THEN A=1:GOTO
{SPACE}40
SQ 180 CLOSE3:END
```

Pegs

Article on page 52.

Program 1: Pegs—64 Version

```
DR 10 DIMP(15),O(8),C(8),TC(14
,15),M$(36)
AR 20 BL$="":FORI=1TO39:BL$=BL
$+" ":NEXT:DC=54272:C=64
:P=49152:B=0:SP=32
CH 30 FORI=1TO15:READP(I):NEXT
BD 40 FORI=1TO8:READC(I):NEXT:
FORI=1TO8:READO(I):NEXT
XR 50 FORI=1TO18:READM$(I)
KF 60 M$(I+18)=RIGHT$(M$(I),1)
+MID$(M$(I),2,1)+LEFT$(M
$(I),1):NEXT
XJ 70 FORI=PTOP+22:READD:POKEI
,D:NEXT
FK 80 PRINT"[CLR]{BLK}":POKE5
3280,6:POKE53281,15
RR 90 PRINT"[RVS]{BLU}
{18 SPACES}PEGS
{18 SPACES}{OFF}":
GH 100 SYSP,2,1:PRINT"[BLK]SCO
RE:":S:FORI=1TO15:POKEP
(I),I:POKEP(I)+DC,2
PQ 110 NEXT:FORI=2TO15:FORJ=1T
O8:POKEP(I)+O(J),C(J):P
OKEP(I)+O(J)+DC,B:NEXT:
NEXT
PP 120 FORI=1TO8:POKEP(1)+O(I)
+DC,B:POKEP(1)+O(I),SP:
NEXT
HA 130 T=1:FORI=2TO15:TC(T,I)=
1:NEXT:TC(T,1)=0:S=0
MP 140 SYSP,23,0:PRINTBL$:SYSP
,23,14:PRINT"YOUR MOVE"
;
BG 150 INPUTA$:IFT>1ANDA$="4"
T
HEN340
EQ 160 IFLEN(A$)<>2THEN310
XE 170 BM=1:FORI=1TO36:IFA$=LE
FT$(M$(I),1)+RIGHT$(M$(
I),1)THENBM=0:MC=I:I=36
MA 180 NEXT:IFBM>0THEN310
QM 190 MF=ASC(LEFT$(A$,1))-C:J
P=ASC(MID$(M$(MC),2,1))
-C:MT=ASC(RIGHT$(A$,1))
-C
CH 200 IFTC(T,MF)=0ORTC(T,MT)=
1ORTC(T,JP)=0THEN310
RB 210 FORI=1TO8:POKEP(MF)+O(I)
,SP:POKEP(MT)+O(I),C(I)
):NEXT
BA 220 FORI=1TO8:POKEP(JP)+O(I)
,SP:NEXT:GOSUB460
GC 230 T=T+1:FORI=1TO15:TC(T,I)
)=TC(T-1,I):NEXT
FQ 240 TC(T,MF)=0:TC(T,MT)=1:T
C(T,JP)=0:S=S+1
HH 250 SYSP,2,1:PRINT"SCORE:":
S;"{LEFT}":IFS=13THENG
OTO440
FH 260 LC=0:FORI=1TO36:X=TC(T,
ASC(LEFT$(M$(I),1))-C)
FS 270 Y=TC(T,ASC(MID$(M$(I),2
,1))-C):Z=TC(T,ASC(RIGH
T$(M$(I),1))-C)
SF 280 IFX>0THENIFY>0THENIFZ=0
THENLC=1:I=36
PC 290 NEXT:IFLC=0THEN380
```



```

RF 300 GOTO140
DG 310 SYSP,23,0:PRINTBL$:SYSP
      23,13:PRINT"ILLEGAL MO
      VE"
DM 320 FORI=1TO10:POKE54296,15
      :FORJ=1TO2:NEXT:POKE542
      96,0:FORJ=1TO2:NEXT:NEX
      T
MB 330 FORI=1TO250:NEXT:GOTO14
      0
DQ 340 T=T-1:S=S-1:FORI=1TO15
FD 350 IFTC(T,I)=0ANDTC(T+1,I)
      =1THENFORJ=1TO8:POKEP(I
      )+O(J),SP:NEXT
CC 360 IFTC(T,I)=1ANDTC(T+1,I)
      =0THENFORJ=1TO8:POKEP(I
      )+O(J),C(J):NEXT
FM 370 NEXT:GOTO250
XC 380 SYSP,23,0:PRINTBL$:SYSP
      23,6:PRINT"GAME OVER -
      YOUR SCORE IS";S
PM 390 FORI=0TO2100:NEXT
PP 400 SYSP,23,0:PRINTBL$:SYSP
      23,4:INPUT"PLAY AGAIN
      {SPACE}(Y/N) OR BACKUP
      {SPACE}(4)";A$
RM 410 IFLEFT$(A$,1)="Y"THENSY
      SP,2,1:PRINTBL$:S=0:GOT
      O100
AC 420 IFA$="4"THEN340
MC 430 PRINT"{CLR}":END
BH 440 SYSP,23,0:PRINTBL$:SYSP
      23,6:PRINT"CONGRATULAT
      IONS, YOU WON"
BB 450 FORI=1TO20:FORJ=1TO15:P
      OKE53280,J:NEXT:NEXT:PO
      KE53280,6:GOTO400
JS 460 POKEDC+24,15:POKEDC+1,1
      10:POKEDC+5,9:POKEDC+6,
      9:POKEDC+4,17:POKEDC+4,
      16
RE 470 RETURN
KQ 480 DATA 1203,1360,1366,151
      7,1523,1529,1674,1680
XD 490 DATA 1686,1692,1831,183
      7,1843,1849,1855
GB 500 DATA 85,64,73,66,75,64,
      74,66,-41,-40,-39,1,41,
      40,39,-1
MM 510 DATA ABD,ACF,BDG,BEI,CE
      H,CFJ,DEF,DGK,DHM
MF 520 DATA EHL,EIN,FIM,FJO,GH
      I,HIJ,KLM,LNM,MNO
SQ 530 DATA 32,13,192,132,251,
      32,13,192,166,251,76,24
      0
QQ 540 DATA 255,32,253,174,32,
      158,173,32,170,177,96

```

Program 2: Pegs—VIC Version

Note: An 8K or 16K expander is necessary to run this program.

```

DR 10 DIMP(15),O(8),C(8),TC(14
      ,15),M$(36)
PD 20 BL$="":FORI=1TO21:BL$=BL
      $+" ":NEXT:DC=33792:C=64
      :P=828:B=2:SP=32
CH 30 FORI=1TO15:READP(I):NEXT
BD 40 FORI=1TO8:READC(I):NEXT:
      FORI=1TO8:READO(I):NEXT
XR 50 FORI=1TO18:READM$(I)
KF 60 M$(I+18)=RIGHT$(M$(I),1)
      +MID$(M$(I),2,1)+LEFT$(M
      $(I),1):NEXT
MM 70 FORI=PTOP+15:READD:POKEI
      ,D:NEXT
HK 80 PRINT"{CLR}{BLK}";:POKE3
      6879,30
PM 90 PRINT"{RVS}{BLU}

```

```

[9 SPACES]PEGS[9 SPACES]
[OFF]";
HH 100 SYSP,2,0:PRINT"{BLK}SCO
      RE";S:FORI=1TO15:POKEP(
      I),I:POKEP(I)+DC,0
PQ 110 NEXT:FORI=2TO15:FORJ=1T
      O8:POKEP(I)+O(J),C(J):P
      OKEP(I)+O(J)+DC,B:NEXT:
      NEXT
PP 120 FORI=1TO8:POKEP(1)+O(I)
      +DC,B:POKEP(1)+O(I),SP:
      NEXT
HA 130 T=1:FORI=2TO15:TC(T,I)=
      1:NEXT:TC(T,1)=0:S=0
KX 140 SYSP,21,0:PRINTBL$:SYSP
      21,5:PRINT"YOUR MOVE";
AE 150 INPUTA$:IFT>1ANDA$="-4"
      HEN330
EQ 160 IFLEN(A$)<>2THEN310
XE 170 BM=1:FORI=1TO36:IFA$=LE
      FT$(M$(I),1)+RIGHT$(M$(
      I),1)THENBM=0:MC=I:I=36
MA 180 NEXT:IFBM>0THEN310
QM 190 MF=ASC(LEFT$(A$,1))-C:J
      P=ASC(MID$(M$(MC),2,1))
      -C:MT=ASC(RIGHT$(A$,1))
      -C
CH 200 IFTC(T,MF)=0ORTC(T,MT)=
      1ORTC(T,JP)=0THEN310
RB 210 FORI=1TO8:POKEP(MF)+O(I
      ),SP:POKEP(MT)+O(I),C(I
      ):NEXT
PF 220 FORI=1TO8:POKEP(JP)+O(I
      ),SP:NEXT:GOSUB480
GC 230 T=T+1:FORI=1TO15:TC(T,I
      )=TC(T-1,I):NEXT
FQ 240 TC(T,MF)=0:TC(T,MT)=1:T
      C(T,JP)=0:S=S+1
HD 250 SYSP,2,0:PRINT"SCORE";S
      ;"{LEFT}":IFS=13THENG0
      TO460
FH 260 LC=0:FORI=1TO36:X=TC(T,
      ASC(LEFT$(M$(I),1))-C)
FS 270 Y=TC(T,ASC(MID$(M$(I),2
      ,1))-C):Z=TC(T,ASC(RIGH
      T$(M$(I),1))-C)
SF 280 IFX>0THENIFY>0THENIFZ=0
      THENLC=1:I=36
XD 290 NEXT:IFLC=0THEN370
RF 300 GOTO140
BC 310 SYSP,21,0:PRINTBL$:SYSP
      21,5:PRINT"ILLEGAL MOV
      E"
PG 320 POKE36878,15:POKE36874,
      129:FORTD=1TO600:NEXT:P
      OKE36878,0:POKE36874,0:
      GOTO140
HR 330 T=T-1:S=S-1:FORI=1TO15
KD 340 IFTC(T,I)=0ANDTC(T+1,I)
      =1THENFORJ=1TO8:POKEP(I
      )+O(J),SP:NEXT
GD 350 IFTC(T,I)=1ANDTC(T+1,I)
      =0THENFORJ=1TO8:POKEP(I
      )+O(J),C(J):NEXT
KF 360 NEXT:GOTO250
FB 370 SYSP,21,0:PRINTBL$:SYSP
      21,7:PRINT"GAME OVER":
      PRINT"[3 SPACES]YOUR SC
      ORE IS";S
HM 380 FORI=0TO4100:NEXT
JP 390 SYSP,21,0:PRINTBL$:SYSP
      21,2:PRINT"PLAY AGAIN
      (Y/N)"
AM 400 PRINT"[4 SPACES]OR BACK
      UP (?):{LEFT}";
DS 410 POKE198,0:WAIT198,1:GET
      A$
KM 420 IFA$="Y"THENS=0:GOTO80
SQ 430 IFA$="4"THENSYSP,22,0:P
      RINTBL$:GOTO330

```

```

QX 440 IFA$<>"N"THEN410
CA 450 PRINT"{CLR}":END
JP 460 SYSP,21,0:PRINTBL$:SYSP
      21,6:PRINT"YOU WON"
RK 470 FOR Q1=1TO20:FORQ2=24TO
      30:POKE36879,Q2:NEXTQ2,
      Q1:GOTO390
KH 480 POKE36876,180:FORA=15TO
      0STEP-.3:POKE36878,A:NE
      XT:POKE36876,0:RETURN
RB 490 DATA 4150,4236,4240,432
      2,4326,4330,4408,4412,4
      416,4420
HD 500 DATA 4494,4498,4502,450
      6,4510
MK 510 DATA 85,64,73,72,75,64,
      74,66,-23,-22,-21,1,23,
      22,21,-1
SP 520 DATA ABD,ACF,BDG,BEI,CE
      H,CFJ,DEF,DGK,DHM
GE 530 DATA EHL,EIN,FIM,FJO,GH
      I,HIJ,KLM,LNM,MNO
SF 540 DATA 32,155,215,138,72,
      32,155,215,138,168,104,
      170,24,76,240,255

```

Program 3: Pegs—Plus/4 and 16 Version

```

HB 10 DIMP(15),O(8),C(8),TC(14
      ,15),M$(36):Z1=65305:Z2=
      65301
KH 20 BL$="":FORI=1TO39:BL$=BL
      $+" ":NEXT:DC=-1024:C=64
      :B=66:SP=32
CH 30 FORI=1TO15:READP(I):NEXT
BD 40 FORI=1TO8:READC(I):NEXT:
      FORI=1TO8:READO(I):NEXT
XR 50 FORI=1TO18:READM$(I)
KF 60 M$(I+18)=RIGHT$(M$(I),1)
      +MID$(M$(I),2,1)+LEFT$(M
      $(I),1):NEXT
MP 70 PRINT"{CLR}{BLK}";:POKEZ
      1,70
AQ 80 PRINT"{RVS}{BLU}
      [18 SPACES]PEGS
      [18 SPACES]{OFF}";
DD 90 CHAR 1,1,2,"":PRINT"
      {BLK}SCORE";S:FORI=1TO1
      5:POKEP(I),I:POKEP(I)+DC
      ,0
HQ 100 NEXT:FORI=2TO15:FORJ=1T
      O8:POKEP(I)+O(J),C(J):P
      OKEP(I)+O(J)+DC,B:NEXT:
      NEXT
XM 110 FORI=1TO8:POKEP(1)+O(I)
      +DC,B:POKEP(1)+O(I),SP:
      NEXT
CX 120 T=1:FORI=2TO15:TC(T,I)=
      1:NEXT:TC(T,1)=0:S=0
SA 130 CHAR 1,0,23,"":PRINTBL$
      :CHAR 1,4,23,"":PRINT"Y
      OUR MOVE";
JH 140 INPUTA$:IFT>1ANDA$="-4"
      HEN330
FS 150 IFLEN(A$)<>2THEN300
PH 160 BM=1:FORI=1TO36:IFA$=LE
      FT$(M$(I),1)+RIGHT$(M$(
      I),1)THENBM=0:MC=I:I=36
MC 170 NEXT:IFBM>0THEN300
JR 180 MF=ASC(LEFT$(A$,1))-C:J
      P=ASC(MID$(M$(MC),2,1))
      -C:MT=ASC(RIGHT$(A$,1))
      -C
JF 190 IFTC(T,MF)=0ORTC(T,MT)=
      1ORTC(T,JP)=0THEN300
BB 200 FORI=1TO8:POKEP(MF)+O(I
      ),SP:POKEP(MT)+O(I),C(I
      ):NEXT
KQ 210 FORI=1TO8:POKEP(JP)+O(I
      ),SP:NEXT:GOSUB450

```



```

MF 220 T=T+1:FORI=1TO15:TC(T,I
)=TC(T-1,I):NEXT
KR 230 TC(T,MF)=0:TC(T,MT)=1:T
C(T,JP)=0:S=S+1
SX 240 CHAR1,1,2,"":PRINT"SCOF
E:";S;"{LEFT} ":IFS=13T
HENGOTO430
KH 250 LC=0:FORI=1TO36:X=TC(T,
ASC(LEFT$(M$(I),1))-C)
KS 260 Y=TC(T,ASC(MID$(M$(I),2
,1))-C):Z=TC(T,ASC(RIGH
T$(M$(I),1))-C)
ME 270 IFX>0THENIFY>0THENIFZ=0
THENLC=1:I=36
QQ 280 NEXT:IFLC=0THEN370
XF 290 GOTO130
EJ 300 CHAR 1,0,23,"":PRINTBL$
:CHAR1,13,23,"":PRINT"I
LLEGAL MOVE"
KE 310 VOL8:SOUND 1,0,20
AD 320 FORI=1TO250:NEXT:GOTO13
0
HR 330 T=T-1:S=S-1:FORI=1TO15
KD 340 IFTC(T,I)=0ANDTC(T+1,I)
=1THENFORJ=1TO8:POKEP(I
)+O(J),SP:NEXT
GD 350 IFTC(T,I)=1ANDTC(T+1,I)
=0THENFORJ=1TO8:POKEP(I
)+O(J),C(J):NEXT
PE 360 NEXT:GOTO240
GK 370 CHAR1,0,23,"":PRINTBL$:
CHAR 1,6,23,"":PRINT"GA
ME OVER - YOUR SCORE IS
";S
XP 380 FORI=0TO2100:NEXT
JF 390 CHAR1,0,23,"":PRINTBL$:
CHAR1,4,23,"":INPUT"PLA
Y AGAIN (Y/N) OR BACKUP
(-)";A$
AE 400 IFLEFT$(A$,1)="Y"THENCH
AR1,1,2,"":PRINTBL$:S=0
:GOTO70
SR 410 IFA$="-"THEN330
XR 420 PRINT"[CLR]":END
GS 430 CHAR 1,0,23,"":PRINTBL$:
CHAR 1,6,23,"":PRINT"C
ONGRATULATIONS, YOU WON
"
DP 440 FORI=1TO20:FORJ=1TO15:P
OKEZ1,J+80:NEXT:NEXT:PO
KEZ1,70:GOTO390
ES 450 SOUND 1,960,30:FOR A=8
[SPACE]TO 1 STEP-.2:VOL
A:NEXT
KD 460 RETURN
XQ 470 DATA 3251,3408,3414,356
5,3571,3577,3722,3728
GJ 480 DATA 3734,3740,3879,388
5,3891,3897,3903
RB 490 DATA 85,64,73,66,75,64,
74,66,-41,-40,-39,1,41,
40,39,-1
GM 500 DATA ABD,ACF,BDG,BEI,CE
H,CFJ,DEF,EGK,DHM
SG 510 DATA EHL,EIM,FIM,FJO,GH
I,HIJ,KLM,LMN,MNO

```

```

0841:0E BD 63 08 20 D2 FF CA CB
0849:10 F7 88 10 F2 A9 0D 20 E9
0851:D2 FF 20 D2 FF E6 02 E6 82
0859:02 A5 02 C9 10 D0 CE 4C 5E
0861:73 08 1D 91 B7 98 9D 55
0869:9D 9D 11 A9 92 20 A9 12 E6
0871:05 00 A0 09 A9 00 85 02 03
0879:A6 02 BD B0 08 C9 FF F0 78
0881:08 20 D2 FF E6 02 4C 79 49
0889:08 88 10 03 4C C6 13 E8 7E
0891:E6 02 BD B0 08 85 D3 E8 3F
0899:E6 02 BD B0 08 85 D6 48 AC
08A1:8A 48 98 48 20 10 E5 68 16
08A9:A8 68 A4 68 4C 85 08 FF 8C
08B1:21 05 1C 1F 1F 1F 1F 1F DB
08B9:1F FF 21 06 1F 1F 1F 1F B0
08C1:1F 1F FF 23 08 1F 1F 1F 75
08C9:FF 22 0A FF 21 0C 1F 91 AC
08D1:91 91 51 2D 42 49 52 44 2C
08D9:FF 04 11 1E 48 49 53 43 40
08E1:4F 52 45 3A 99 30 30 30 98
08E9:30 30 FF 05 13 1E 53 43 69
08F1:4F 52 45 3A 99 30 30 30 A8
08F9:30 30 FF 19 11 1E 4C 45 9E
0901:56 45 4C 3A 99 30 31 FF AC
0909:19 13 1E 4C 49 56 45 53 76
0911:3A 99 FF A9 97 20 D2 FF 24
0919:A0 02 A9 A4 20 31 09 A0 F3
0921:10 A9 A3 20 31 09 A0 14 1F
0929:A9 A4 20 31 09 4C 45 09 5D
0931:84 D6 A0 00 84 D3 48 20 73
0939:10 E5 68 A2 26 20 D2 FF 5B
0941:CA 10 FA 60 A9 1F 85 D3 CA
0949:A9 03 85 D6 20 10 E5 A2 BE
0951:0C A9 A7 20 D2 FF A9 9D 52
0959:20 D2 FF A9 11 20 D2 FF 79
0961:CA 10 EE 60 00 00 A9 FF 14
0969:8D 1C D0 A9 00 8D 15 D0 2F
0971:8D 1D D0 8D 17 D0 A9 07 DA
0979:8D 25 D0 4C 80 B0 00 03 AD
0981:C0 00 0E B0 F0 3A AF AC 3D
0989:36 6A AC D6 AA B0 3A AA 8B
0991:B0 0E AA C0 33 67 00 03 99
0999:77 00 0D DD C0 03 33 00 5F
09A1:00 00 00 00 00 00 00 B3
09A9:00 00 00 00 00 00 00 BB
09B1:00 00 00 00 00 00 00 C3
09B9:00 00 00 00 00 00 00 CE
09C1:C3 00 0E BE F0 3A AA EC 16
09C9:D6 6B AC 36 AB B0 DA EA 9F
09D1:B0 3E AA C0 03 67 00 03 E5
09D9:77 00 03 77 00 0D DD C0 30
09E1:03 33 00 00 00 00 00 42
09E9:00 00 00 00 00 00 00 FB
09F1:00 00 00 00 00 00 00 04
09F9:00 00 00 00 00 00 00 0C
0A01:0F 00 3C 3A C0 EB EA B0 04
0A09:EA A6 70 3A AA 5C 3A AA D3
0A11:B0 0E AA C0 03 67 00 03 1B
0A19:77 00 0D DD C0 03 33 00 E0
0A21:00 00 00 00 00 00 00 35
0A29:00 00 00 00 00 00 00 3D
0A31:00 00 00 00 00 00 00 45
0A39:00 00 00 00 00 00 00 50
0A41:0F 00 3E FA C0 EE AA B0 1C
0A49:EB A6 5C 3B AA 70 3A EA B2
0A51:9C 0E AA F0 03 67 00 03 54
0A59:77 00 03 77 00 0D DD C0 B1
0A61:03 33 00 00 00 00 00 C3
0A69:00 00 00 00 00 00 00 7D
0A71:00 00 00 00 00 00 00 85
0A79:00 00 00 00 00 00 00 90
0A81:C0 00 0E B0 00 36 6C 00 74
0A89:EA AC 00 FE AC 00 EA AC 16
0A91:00 3E B0 00 EA AC 00 35 8A
0A99:AC 00 0D AC 00 0D AC 00 FD
0AA1:0D AC 00 3A AC 00 EA B0 F6
0AA9:00 3E B0 00 0E B0 00 03 99
0AB1:AC 00 00 F0 00 00 00 00 2B
0AB9:00 00 00 00 00 00 00 03 D0
0AC1:C0 00 0E B0 00 36 6C 00 B4
0AC9:EA AC 00 EA AC 00 3A B0 B7
0AD1:00 0E AC 00 3A AC 00 E5 69

```

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0AD9:AC 00 3D AC 00 0D AC 00 44
0AE1:0D AC 00 3A B0 00 EA B0 57
0AE9:00 EE B0 00 3E B0 00 03 87
0AF1:B0 00 00 C0 00 00 00 00 6A
0AF9:00 00 00 00 00 00 00 1D
0B01:00 00 3A C0 00 E6 70 00 E6
0B09:EA AC 00 EA FC 00 EA AC D8
0B11:00 3A F0 00 EA AC 00 E9 C7
0B19:70 00 E9 C0 00 E9 C0 00 D9
0B21:E9 C0 00 EA B0 00 3A AC B1
0B29:00 3A F0 00 3A C0 00 EB AC
0B31:00 00 3C 00 00 00 00 CE
0B39:00 00 00 00 00 00 00 5E
0B41:00 00 3A C0 00 E6 70 00 27
0B49:EA AC 00 EA AC 00 3A B0 39
0B51:00 EA C0 00 EA B0 00 E9 3E
0B59:6C 00 E9 F0 00 E9 C0 00 1B
0B61:E9 C0 00 3A B0 00 3A AC E6
0B69:00 3A EC 00 3A F0 00 3B 7C
0B71:00 00 0C 00 00 00 00 09
0B79:00 00 00 00 00 00 00 A9 39
0B81:00 8D 26 D0 A2 07 BD 99 13
0B89:0B 9D 27 D0 BD A1 0B 9D A6
0B91:F8 07 CA 10 F1 4C A9 0B 5F
0B99:05 04 04 04 09 02 06 0E 5E
0BA1:00 2C 2A 2C 3C 3C 26 82 BC
0BA9:A2 0F BD B7 0B 9D 00 D0 A7
0BB1:CA 10 F7 60 00 00 78 66 8D
0BB9:6D 47 FD 47 1D 97 00 00 D3
0BC1:00 00 A9 9E 00 00 20 67 9E
0BC9:09 4C A0 12 4C 55 19 AD 44
0BD1:34 03 C9 07 D0 0F A9 00 82
0BD9:8D 34 03 EE 35 03 AD 35 59
0BE1:03 C9 05 F0 03 4C 08 16 0B
0BE9:20 3A 0C C9 00 F0 03 4C D2
0BF1:C4 11 20 DB 11 29 0F 49 05
0BF9:0F 85 03 29 01 C9 01 D0 ED
0C01:08 A9 00 8D 66 0C 4C 97 F3
0C09:0C A5 03 29 02 C9 02 D0 8F
0C11:08 A9 20 8D 66 0C 4C 97 08
0C19:0C A5 03 29 04 C9 04 D0 B3
0C21:08 A9 40 8D 66 0C 4C 97 1C
0C29:0C A5 03 29 08 C9 08 D0 EB
0C31:B4 A9 60 8D 66 0C 4C 97 86
0C39:0C A9 00 8D 35 03 AD 36 E1
0C41:03 60 8D 21 D0 A9 00 AD 86
0C49:CB 9D 34 03 CA E0 FF D0 10
0C51:F8 60 EE 36 03 AE 36 03 81
0C59:E0 1A D0 08 A9 08 D0 36 A1
0C61:03 4C 46 16 BD 20 0D AA 6B
0C69:BD 80 0C 18 6D 0C D0 8D 4E
0C71:0C D0 BD 8B 0C 18 6D 0D DC
0C79:D0 8D D0 0C 4C 18 00 AE
0C81:00 00 00 FF FF FF 00 01 9A
0C89:01 01 00 FF 01 00 00 FF 6A
0C91:01 00 00 FF 01 00 AD 66 F3
0C99:0C C9 00 F0 0C C9 60 F0 72
0CA1:08 A9 27 8D FE 07 4C 53 E5
0CA9:0C A9 29 8D FE 07 4C 53 30
0CB1:0C CE FE 07 4C E6 0B A9 91
0CB9:04 85 FE A0 00 84 FD A2 CF
0CC1:04 AD 3A 03 18 65 FD 85 96
0CC9:FD A5 FE 69 00 85 FE CA 9F
0CD1:10 EF A5 FD 18 6D 3B 03 72
0CD9:85 FD A5 FE 69 00 85 FE 2E
0CE1:60 00 00 AD 0D D0 38 E9 0B
0CE9:31 8D 3A 03 AD 0C D0 4A FE
0CF1:4A 4A 18 69 0C 8D 3B 03 6B
0CF9:20 B8 0C 4C 99 0D 00 00 97
0D01:01 01 01 01 01 01 01 1B
0D09:09 09 09 09 09 09 09 23
0D11:08 08 08 08 08 08 08 2B
0D19:00 00 00 00 00 00 00 33
0D21:04 04 04 04 04 04 04 3B
0D29:06 06 06 06 06 06 06 43
0D31:02 02 02 02 02 02 02 4B
0D39:00 00 00 00 00 00 00 53
0D41:05 05 05 05 05 05 05 5B
0D49:04 04 04 04 04 04 04 63
0D51:06 06 06 06 06 06 06 6B
0D59:00 00 00 00 00 00 00 73
0D61:09 09 09 09 09 09 09 7B
0D69:08 08 08 08 08 08 08 83

```

Q-Bird

See instructions in article on page 46 before typing in.

```

0801:0B 08 00 00 9E 32 30 36 EC
0809:31 00 00 00 A9 00 8D 20 3A
0811:D0 20 CF 14 20 1B 08 4C 96
0819:C7 0B A9 93 20 D2 FF A9 34
0821:08 20 D2 FF A9 8E 20 D2 32
0829:FF A9 04 85 02 A9 0E 38 87
0831:E5 02 EA EA 85 D3 A5 02 89
0839:85 D6 20 10 E5 A0 06 A2 27

```


0D71:0A	0A	0A	0A	0A	0A	0A	0A	8B	1009:0E	66	C0	3E	AA	F0	35	A9	F2	12A1:06	85	D3	A9	16	85	D6	20	D3
0D79:00	00	00	00	00	00	00	00	A5	1011:70	35	99	70	0D	55	C0	03	33	12A9:10	E5	A2	00	BD	BB	12	20	C4
0D81:FE	18	69	D4	85	FE	A0	02	07	1019:57	00	03	9B	00	03	AB	00	62	12B1:D2	FF	E8	E0	3D	D0	F5	4C	CF
0D89:B1	FD	4C	68	12	20	30	17	94	1021:0E	6C	00	0E	AF	C0	39	BE	F5	12B9:6A	15	08	8E	9E	55	53	45	78
0D91:91	FD	88	10	F3	4C	B2	0C	48	1029:B0	3A	BA	C0	3F	BE	B0	0E	C7	12C1:20	53	54	49	43	4B	20	54	C5
0D99:B1	FD	C9	E9	F0	E1	4C	78	04	1031:AA	B0	0E	6A	C0	03	AB	00	A4	12C9:4F	20	53	45	4C	45	43	54	AE
0DA1:14	EE	37	03	AD	37	03	C9	B2	1039:00	FC	00	00	00	00	00	03	9B	12D1:20	4C	45	56	45	4C	0D	20	BC
0DA9:02	D0	2C	A9	00	8D	37	03	C0	1041:FF	00	0E	66	C0	3A	AA	B0	7E	12D9:00	00	00	20	20	20	20	20	E1
0DB1:EE	38	03	AD	38	03	C9	01	EE	1049:35	99	70	35	55	70	0D	55	A7	12E1:20	50	52	45	53	53	20	54	45
0DB9:D0	1D	A9	00	8D	38	03	A2	AE	1051:C0	03	57	00	03	9B	00	03	07	12E9:52	49	47	47	45	52	20	54	EE
0DC1:01	FE	3C	03	BD	3C	03	DD	96	1059:9B	00	03	AB	00	03	9B	00	A5	12F1:4F	20	53	54	41	52	54	00	71
0DC9:DB	D0	D0	08	A9	00	9D	3C	74	1061:0E	AC	00	0E	6C	00	0E	AC	C0	12F9:00	20	77	15	29	10	D0	0B	9C
0DD1:03	20	00	0E	4C	E5	0E	60	CC	1069:00	0E	6C	00	0E	AC	00	03	C0	1301:20	72	13	A9	40	8D	15	D0	04
0DD9:2E	11	18	18	1C	20	00	00	35	1071:6B	00	03	AB	00	03	9B	00	A5	1309:4C	5B	17	AD	00	DC	29	0F	BE
0DE1:00	A2	18	A9	00	9D	00	D4	8D	1079:00	EA	C0	00	3F	00	00	00	66	1311:49	0F	29	03	C9	01	D0	0D	F5
0DE9:CA	10	FA	A9	FF	8D	0F	D4	90	1081:00	00	00	00	00	00	30	00	02	1319:AD	E1	03	C9	0F	F0	DA	EE	6C
0DF1:A9	80	8D	12	D4	A9	00	4C	6D	1089:00	EC	00	03	AB	00	03	6B	E3	1321:E1	03	4C	34	13	C9	02	D0	5A
0DF9:AE	17	00	00	00	00	00	BD	EE	1091:00	03	6B	00	03	5B	00	03	68	1329:D0	AD	E1	03	C9	02	90	C9	D0
0E01:40	03	C9	00	D0	0D	20	81	B3	1099:9B	00	00	FC	00	00	00	00	57	1331:CE	E1	03	AD	E1	03	C9	0A	2B
0E09:0E	29	03	0A	0A	0A	0A	0A	0E	10A1:00	00	00	00	00	00	00	00	C1	1339:B0	0E	18	69	30	8D	C8	06	24
0E11:20	54	0E	BD	50	03	8D	6E	08	10A9:00	00	00	00	00	00	00	00	C9	1341:A9	30	8D	C7	06	4C	FA	12	DF
0E19:0E	FE	40	03	BC	40	03	C0	E1	10B1:00	00	00	00	00	00	00	00	D1	1349:18	69	26	8D	C8	06	A9	31	56
0E21:1E	D0	09	A9	00	9D	40	03	36	10B9:00	00	00	00	00	00	00	AD	87	1351:8D	C7	06	4C	FA	12	00	EE	C4
0E29:EA	EA	EA	60	86	05	06	05	32	10C1:01	D0	18	69	08	38	ED	F6	24	1359:E3	03	D0	FB	EE	E4	03	AD	CA
0E31:8E	4F	03	EA	20	6D	0E	AA	F4	10C9:03	F0	08	90	03	A9	00	60	D0	1361:E4	03	C9	FF	D0	F6	A9	08	B1
0E39:A4	05	BD	80	0C	18	79	00	5C	10D1:A9	20	60	AD	00	D0	18	69	92	1369:8D	E4	03	AD	00	DC	60	00	FE
0E41:D0	99	00	D0	BD	8B	0C	18	85	10D9:02	38	ED	F5	03	90	03	A9	30	1371:00	A2	27	A9	20	9D	70	07	1F
0E49:79	01	D0	99	01	D0	AE	4F	0E	10E1:40	60	A9	60	60	00	00	AD	26	1379:9D	98	07	CA	10	F7	60	00	43
0E51:03	60	00	9D	50	03	C9	00	03	10E9:F0	03	C9	00	D0	06	20	4F	AA	1381:00	20	91	12	4C	A7	13	EE	19
0E59:F0	0A	C9	60	F0	06	A9	2B	CD	10F1:11	8D	00	11	EE	F0	03	AE	FE	1389:E3	03	D0	FB	EE	E4	03	D0	1E
0E61:9D	F8	07	60	A9	2D	9D	F8	A7	10F9:F0	03	E0	20	F0	27	BD	20	31	1391:F6	EE	E5	A3	AD	E5	03	C9	B0
0E69:07	60	00	00	B9	60	0D	C9	54	1101:0D	AA	C9	00	D0	08	AD	F8	88	1399:02	D0	EC	A9	00	8D	E5	03	32
0E71:00	D0	0A	48	BD	F8	07	29	90	1109:07	29	80	8D	F8	07	BD	80	C1	13A1:8D	15	D0	4C	D3	13	AD	E1	DA
0E79:FE	9D	FA	07	68	00	00	00	D0	1111:0C	18	6D	00	D0	8D	00	D0	7A	13A9:03	C9	00	D0	03	EE	E1	03	6B
0E81:EA	EA	EA	20	DC	0E	AD	3A	E1	1119:BD	8B	0C	18	6D	01	D0	8D	9E	13B1:20	91	12	4C	E0	13	EE	6B	EF
0E89:03	38	E9	2C	8D	3A	03	AD	3E	1121:01	D0	4C	69	11	A9	00	8D	D4	13B9:12	C9	0F	D0	05	A9	00	8D	A6
0E91:3B	03	4A	4A	4A	18	69	0C	8B	1129:F0	03	4C	23	11	EE	F1	03	6B	13C1:6B	12	60	00	00	A9	30	20	55
0E99:8D	3B	A0	83	86	FC	20	B8	0C	1131:AD	F1	03	C9	0A	D0	EB	A9	B8	13C9:D2	FF	A9	35	20	D2	FF	4C	7A
0EA1:A6	FC	AB	00	B1	FD	C9	E9	67	1139:00	8D	F1	03	EE	F2	03	AD	24	13D1:14	09	20	1B	08	AD	E1	03	B7
0EA9:D0	D9	AD	FF	03	60	00	86	7A	1141:F2	03	C9	05	D0	DC	A9	00	74	13D9:C9	0F	F0	03	EE	E1	03	A9	A5
0EB1:05	20	D5	17	29	03	8D	FF	F4	1149:8D	F2	03	4C	E8	10	A9	81	70	13E1:60	8D	46	13	8D	54	13	20	99
0EB9:03	AA	BD	D4	0E	18	79	01	CB	1151:8D	F8	07	4C	00	10	AD	8C	CB	13E9:34	13	A9	4C	8D	46	13	8D	22
0EC1:D0	8D	3A	03	BD	D8	0E	18	A6	1159:D0	8D	F5	03	AD	0D	D0	8D	07	13F1:54	13	20	17	14	20	E4	16	7D
0EC9:79	00	D0	8D	3B	03	A6	05	CD	1161:F6	03	AD	00	DC	60	00	00	DD	13F9:A9	FF	8D	15	D0	AD	E1	03	FB
0ED1:60	00	00	F2	12	02	02	12	FB	1169:EE	FA	03	AD	FA	03	C9	06	7A	1401:85	04	A9	00	A2	CB	9D	34	D5
0ED9:F2	EA	1A	86	05	06	05	A4	C4	1171:D0	0F	A9	00	8D	FA	03	EE	42	1409:03	CA	E0	FF	D0	F8	A5	04	3B
0EE1:05	4C	B0	0E	E8	E0	04	F0	4E	1179:FB	03	AD	FB	03	C9	05	F0	0A	1411:8D	E1	03	4C	91	15	A9	0E	DF
0EE9:03	4C	C2	0D	4C	D8	0D	A2	46	1181:28	4C	ED	11	A9	00	8D	FB	FD	1419:85	D3	A9	16	85	D6	20	23	7A
0EF1:BF	BD	00	10	9D	00	20	CA	56	1189:03	EE	08	D0	AD	08	D0	C9	EF	1421:15	A2	00	20	4C	14	E8	0E	E3
0EF9:E0	FF	D0	F5	4C	E2	0D	00	08	1191:01	D0	EE	20	D5	17	29	07	AC	1429:0B	D0	F8	A9	60	8D	A1	13	54
0F01:FC	00	03	AB	00	0E	5A	C0	66	1199:C9	06	B0	F7	0A	0A	0A	0A	4E	1431:20	88	13	A9	8D	8D	A1	13	81
0F09:39	AA	B0	3A	AA	B0	EA	A9	BF	11A1:18	69	4C	8D	09	D0	4C	82	33	1439:20	DC	14	4C	91	12	9E	47	49
0F11:AC	EA	AA	AC	EA	AA	AC	39	F4	11A9:11	EE	FC	03	AD	FC	03	C9	11	1441:45	54	20	52	45	41	44	59	5B
0F19:AA	B0	39	69	B0	0E	56	C0	A1	11B1:20	D0	D1	AD	FC	07	49	01	C4	1449:00	00	00	BD	3F	14	4C	D2	03
0F21:03	AB	00	00	FC	00	00	00	93	11B9:8D	FC	07	A9	00	8D	FC	03	90	1451:FF	EE	D4	03	D0	FB	EE	D5	2A
0F29:00	00	00	00	00	00	00	00	47	11C1:4C	85	11	AD	FE	03	C9	01	01	1459:03	AD	D5	03	C9	03	D0	F1	47
0F31:00	00	00	00	00	00	00	00	4F	11C9:F0	03	4C	53	0C	EE	FD	03	FE	1461:A9	00	8D	D5	03	20	3A	18	92
0F39:00	00	00	00	00	00	00	00	57	11D1:AD	FD	03	29	01	F0	F3	4C	3D	1469:AD	0D	D0	C9	FF	D0	E2	A9	15
0F41:FC	00	03	AB	00	0E	96	C0	1F	11D9:56	0C	A9	00	8D	FE	03	AD	7B	1471:00	8D	1B	D0	4C	9D	14	A9	18
0F49:3A	A9	B0	3A	AA	B0	EA	AA	41	11E1:00	DC	29	10	D0	03	EE	FE	D0	1479:40	8D	1B	D0	4C	52	14	8D	F6
0F51:AC	EA	AA	AC	EA	AA	AC	39	35	11E9:03	4C	57	11	EE	F3	03	AD	97	1481:15	D0	AD	D0	03	85	FC	A9	FC
0F59:AA	B0	39	6A	B0	0E	5A	C0	F9	11F1:F3	03	C9	05	D0	0F	A9	00	6E	1489:60	8D	14	14	20	E0	13	A9	5D
0F61:03</																										


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1539:BD 5E 15 20 D2 FF E8 E0 C7
1541:0A D0 F5 EE D7 03 D0 FB BA
1549:EE D8 03 D0 F6 EE D9 03 B8
1551:AD D9 03 C9 05 D0 EC A2 AD
1559:00 9A 4C 0D 08 9F 47 41 13
1561:4D 45 20 4F 56 45 52 00 E8
1569:00 A9 0E 8D 15 D0 A9 60 38
1571:8D D8 0D 4C FA 12 20 A2 02
1579:0D EE 0C 03 D0 F8 EE ED E9
1581:03 AD ED 03 C9 09 D0 EE 89
1589:A9 00 8D ED 03 4C 5D 13 30
1591:A9 4C 8D D8 0D A9 10 38 4A
1599:ED E1 03 4A 8D AE 15 EE 78
15A1:AE 15 4C CD 0B 00 EE C1 C6
15A9:03 AD C1 03 C9 08 D0 F6 30
15B1:A9 00 8D C1 03 EE 34 03 BD
15B9:4C D0 0B 20 44 19 29 F8 73
15C1:18 69 06 8D 0D 50 20 D5 AB
15C9:17 29 F8 18 69 01 8D 0C E0
15D1:50 20 E4 0C A0 00 B1 FD EF
15D9:C9 E9 D0 DF AD 0C 50 8D 47
15E1:0E D0 AD 0D 50 8D 0F D0 75
15E9:A9 4C 8D FC 0C 4C F9 15 18
15F1:A9 60 8D FC 0C 4C 3B 16 A8
15F9:A9 D0 8D EF 0C 8D E6 0C 4E
1601:4C CD 0B 00 00 00 00 AD D5
1609:C5 03 C9 00 F0 03 4C 6C AA
1611:16 EE CA 03 AD CA 03 C9 F5
1619:70 D0 16 20 F9 16 AD CB C5
1621:03 C9 00 D0 0C AD 0F D0 54
1629:C9 00 F0 08 A9 00 8D 0F 50
1631:D0 4C 98 16 20 F1 15 4C 8C
1639:32 16 A9 50 8D EF 0C 8D 10
1641:E6 0C 4C BC 15 AD 0C D0 81
1649:38 ED 0E D0 C9 00 D0 18 E3
1651:AD 0D D0 38 ED 0F D0 C9 4C
1659:0D D0 0D 20 68 17 A9 7F CF
1661:8D C5 03 A9 00 8D 0F D0 E5
1669:4C E4 0C EE C6 03 AD C6 C9
1671:03 D0 21 EE C7 03 AD C7 D3
1679:03 C9 16 D0 17 A9 00 8D 56
1681:C7 03 EE C8 03 20 7A 19 63
1689:C9 10 D0 08 A9 00 8D C8 6A
1691:03 8D C5 03 4C 04 17 EE 1B
1699:2E D0 EA EA EA A2 0A BD D0
16A1:00 D0 18 7D C8 16 38 ED D9
16A9:0C D0 C9 05 00 12 BD 01 E3
16B1:D0 18 7D C9 16 38 ED 0D 13
16B9:D0 C9 05 0B 03 4C A6 17 1A
16C1:CA CA 10 DB 4C A2 0D 04 D0
16C9:0B FF 0A FF 0A FF 0A 05 26
16D1:05 03 04 A9 60 8D A1 13 EB
16D9:20 32 18 A9 8D 8D A1 13 39
16E1:4C 78 14 EE CC 13 AD CC 9E
16E9:13 C9 3A D0 08 A9 30 8D 3B
16F1:CC 13 EE C7 13 4C 80 0B 79
16F9:A9 00 8D CA 03 EE CB 03 C7
1701:60 00 00 EE C1 03 AD C1 85
1709:03 C9 04 D0 08 A9 00 8D 2D
1711:01 03 4C CD 0B 4C 08 16 F6
1719:A2 03 FE 03 07 BD 03 07 A5
1721:C9 3A D0 08 A9 30 9D 03 A9
1729:07 CA 10 EE 4C 4D 17 C0 05
1731:00 D0 0E 84 FC A4 04 20 40
1739:19 17 88 C0 01 D0 F8 A4 B8
1741:FC A5 04 60 00 00 20 30 4E
1749:17 4C 88 13 A2 04 BD 03 FB
1751:07 9D F6 08 CA 10 F7 4C 9C
1759:70 17 A2 04 A9 30 9D 03 66
1761:07 CA 10 FA 4C 82 13 A2 AC
1769:02 20 1B 17 60 00 00 A2 1B
1771:00 38 BD B4 06 FD 03 07 E5
1779:30 09 E9 01 10 13 E8 00 CE
1781:05 D0 EE A2 04 BD 03 07 92
1789:9D B4 06 9D E6 08 CA 10 4B
1791:F4 60 00 00 AD 36 03 C9 68
1799:06 90 07 C9 15 0B 03 4C 2A
17A1:C1 16 4C D4 16 AD FE 03 75
17A9:D0 EA 4C D4 16 A9 30 8D 17
17B1:BA 17 A2 00 AD 1B D4 9D 78
17B9:00 50 E8 D0 F7 EE BA 17 2E
17C1:AD BA 17 C9 50 D0 EB A9 3C
17C9:30 8D EE 17 A9 00 8D ED 19

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17D1:17 4C F2 17 AD ED 17 18 D9
17D9:69 01 8D ED 17 AD EE 17 F1
17E1:69 00 C9 4F D0 02 A9 30 05
17E9:8D EE 17 AD 47 30 60 00 14
17F1:00 A9 E1 8D 14 D4 A9 21 08
17F9:8D 12 D4 A9 0F 8D 18 D4 5C
1801:4C 2A 18 AE 36 03 BD 10 19
1809:18 8D 0F D4 4C E6 0B 00 EB
1811:80 7C 78 74 70 6E 6C 6A 77
1819:68 66 00 00 00 00 00 17
1821:00 00 00 00 00 00 00 51
1829:00 A9 00 8D 05 D4 4C FC
1831:19 A9 00 8D 0F D4 4C 88 1E
1839:13 EE 0D D0 AD 0D D0 49 E9
1841:FF 8D 0F D4 60 00 00 A9 B0
1849:08 8D 0F D4 8D 0A D4 A9 37
1851:77 8D 06 D4 8D 0D D4 A9 A2
1859:41 8D 0B D4 A9 4C 8D 14 E9
1861:14 A9 00 8D 0F D4 4C 10 53
1869:19 AD FE 2F C9 01 D0 1B 73
1871:AE FF 2F BD 08 19 8D 08 82
1879:D4 A9 28 8D 01 D4 A9 81 8C
1881:8D 04 D4 8D 00 8D 04 D4 C5
1889:4C 05 19 C9 0F D0 28 A9 96
1891:40 8D 0B D4 A9 41 8D 0B 6C
1899:D4 A9 1E 8D 01 D4 EE FF 75
18A1:2F AE FF 2F BD 08 19 8D D5
18A9:08 D4 A9 81 8D 04 D4 A9 30
18B1:80 8D 04 D4 4C 05 19 C9 C5
18B9:10 D0 0F AE FF 2F BD 08 33
18C1:19 18 69 02 8D 08 D4 4C 54
18C9:05 19 C9 18 D0 23 A9 40 24
18D1:8D 0B D4 A9 41 8D 0B D4 EB
18D9:AE FF 2F BD 08 19 18 69 61
18E1:04 8D 08 D4 A9 81 8D 04 38
18E9:D4 A9 80 8D 04 D4 4C 05 E8
18F1:19 C9 1E D0 0F 20 21 19 46
18F9:AD FF 2F C9 08 D0 05 A9 BA
1901:00 8D FF 2F 4C 2C 19 04 D2
1909:08 0C 10 14 10 0C 08 78 BE
1911:A9 32 8D 14 03 A9 19 8D 16
1919:15 03 58 A9 00 4C 43 0C FF
1921:EE FF 2F A9 00 8D FE 2F AE
1929:60 00 00 EE FE 2F 4C 31 F8
1931:EA EE FD 2F AD FD 2F 29 34
1939:01 C9 01 F0 03 4C 31 EA 24
1941:4C 6A 18 20 05 17 C9 B0 88
1949:B0 F9 60 8D FE 2F 8D FF 07
1951:2F 4C 65 19 AD 8D 02 D0 E4
1959:03 4C A7 15 A9 00 8D 0F DD
1961:D4 4C 55 19 A9 58 8D 18 2F
1969:03 A9 15 8D 19 03 A9 00 2B
1971:8D 10 D0 8D 1B D0 4C 48 5E
1979:18 AD C8 03 C9 0B 90 08 10
1981:AD 2D D0 49 08 8D 2D D0 26
1989:AD C8 03 60 A9 40 8D 15 A9
1991:D0 A9 A9 8D 0C D0 A9 9E 3A
1999:8D 0D D0 A9 26 8D FE 07 F6
19A1:AD 17 07 60 00 00 00 00 57

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The Animals' Show

Article on page 56.

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HB 70 SCNCCLR:COLOR0,1:COLOR4,1
DP 80 GRAPHIC1,1:GRAPHIC0
JC 90 TEMPO57
QC 100 CHAR,2,2,"[F6]TO SELECT:
"
QH 110 CHAR,4,4,"JOYSTICK - PR
ESS FIRE BUTTON"
KS 120 CHAR,4,6,"KEYPAD --- PR
ESS 'ENTER' KEY"
BC 130 IFJOY(2)>127THENS$="300
REM JOYSTICK":GOTO160
BX 140 GETES:IFE$=CHR$(13)THEN
S$="300 GOTO340:REM KEY
PAD":GOTO160
BP 150 GOTO130
DA 160 PRINT"[CLR]{3 DOWN}"S$:
PRINT"GOTO180[HOME]"
HJ 170 POKE208,2:POKE842,13:PO
KE843,13:END

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GG 180 SCNCCLR
JP 190 SE=200:REM MAXIMUM SONG
LENGTH
ES 200 DIM AN$(6),ZUS$(30),VS$(8
),SG(SE),AP(2,8),ST$(61
2)
CH 210 GOSUB3560
SB 220 GOSUB3200
GH 230 GOSUB3360
DG 240 CHAR,14,22,"YOU'RE ON I
N"
GX 250 CHAR,10,23,"15 SECONDS,
MAESTRO!"
MP 260 GOSUB3480
KE 270 GOSUB490
MH 280 END
KH 290 REM INPUT DEVICE SUBROU
TINE
JP 300 REM
PB 310 ID=JOY(2):IFID=0GOTO310
EG 320 IFID>128THENID=ID-128
DM 330 RETURN
BC 340 GETKEYNK$
MJ 350 ONVAL(NK$)GOTO390,400,4
10,420,340,430,440,450,
460
FE 360 IFNK$="0"THENID=0:GOTO4
70
ME 370 IFNK$=CHR$(13)THENID=12
8:GOTO470
RQ 380 GOTO340
KF 390 ID=6:GOTO470
HC 400 ID=5:GOTO470
CC 410 ID=4:GOTO470
BE 420 ID=7:GOTO470
BF 430 ID=3:GOTO470
CG 440 ID=8:GOTO470
HE 450 ID=1:GOTO470
JE 460 ID=2
RE 470 RETURN
MK 480 REM MENU ROUTINE
BA 490 SCNCCLR:POKE2604,24
CF 500 GOSUB3140
PP 510 FORI=1TO5:SPRSVZUS(I*6
),I:NEXT
FB 520 MOVSPR1,104,122:MOVSPR2
,120,82:MOVSPR3,172,74:
MOVSPR4,224,82:MOVSPR5,
240,122
MK 530 CHAR,17,10,"[83]()*+,
"
JR 540 CHAR,11,14,"[73]@@@-
[DOWN]{4 LEFT}@./@
[DOWN]{4 LEFT}@01@"
BP 550 CHAR,18,16,"[RED]6778
[DOWN]{4 LEFT}9:;<
[DOWN]{4 LEFT}=>>?"
PK 560 CHAR,25,14,"[YEL]WXYZ
[DOWN]{4 LEFT}2345
[DOWN]{4 LEFT}+[-3-_"
DC 570 SPRCOLOR13,2
SE 580 FORI=1TO5:SPRITEI,1,16,
,,,1:NEXT
GP 590 CH=1
KH 600 FORID=1TO8
XD 610 GOSUB2980
QK 620 CH=ID
FJ 630 NEXT
DS 640 ID=1
XE 650 GOSUB2980
GX 660 CH=ID
PK 670 GOSUB300
QQ 680 IFID>8GOTO720
XK 690 GOSUB2980
XS 700 CH=ID
GC 710 GOTO670
EK 720 FORI=1TO5:SPRITEI,0:NEX
T
CJ 730 SCNCCLR
FF 740 GOSUB3140
PP 750 ONCHGOTO1370,1370,1370,
1100,770,810,1370,1370
PE 760 REM END PROGRAM
MG 770 POKE2604,20

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CF 780 COLOR0,12:COLOR4,14:COL
    OR5,14
KK 790 RETURN
DM 800 REM DISK ROUTINE
KJ 810 POKE2604,20
BB 820 CHAR,1,1,"[7]DO YOU WIS
    H TO {CYN}{RVS}S{OFF}
    [7]AVE YOUR SONG
    [11 SPACES]{DOWN}OR
    {CYN}{RVS}L{OFF}[7]OAD
    {SPACE}AN OLD SONG?"
BF 830 GETKEY$
SK 840 IFA$="S"THENCHAR,1,5,"
    {CYN}SAVE",1:GOTO870
SJ 850 IFA$="L"THENCHAR,1,5,"
    {CYN}LOAD",1:GOTO870
DR 860 GOTO830
GH 870 CHAR,1,7,"[7]WHAT IS TH
    E"
RS 880 CHAR,1,8,"SONG'S NAME"
HE 890 CHAR,1,9,"-----"
    -----
QR 900 CHAR,12,8,"{CYN}"
GJ 910 INPUTN$="S"+N$
KJ 920 IFLEN(N$)>16THENN$=LEFT
    $(N$,16)
SG 930 IFA$="L"GOTO1020
HS 940 DOPEN#1,(N$),D0,U8,W
AF 950 GOSUB5440
BE 960 IFDS=63THENDCLOSE#1,U8:
    CHAR,1,1,"{YEL}THERE IS
    A SONG ON THIS DISK WI
    TH THAT{2 SPACES}{DOWN}
    NAME. PLEASE ENTER A DI
    FFERENT NAME.":GOTO870
XF 970 FORI=1TOSE
RQ 980 PRINT#1,SG(I)
MA 990 NEXT
GS 1000 DCLOSE#1,U8:GOSUB5440
GS 1010 GOTO490
SB 1020 DOPEN#1,(N$),D0,U8
DJ 1030 GOSUB5440
QK 1040 IFDS=62THENDCLOSE#1,U8
    :SCNCLR:CHAR,4,4,"[3]T
    HERE IS NO SONG WITH T
    HAT NAME":CHAR,13,6,"O
    N THIS DISK.":SLEEP6:G
    OTO490
FA 1050 FORI=1TOSE
XE 1060 INPUT#1,SG(I)
SF 1070 NEXT
EP 1080 DCLOSE#1,U8:GOSUB5440:
    SCNCLR
JC 1090 REM PLAY ROUTINE
SC 1100 POKE2604,24
JJ 1110 FORI=1TO5:SPRITEI,1:NE
    XT
EP 1120 CHAR,17,10,"[8]()*+,"
AR 1130 CH=1:FORID=1TO8
XB 1140 IFID>3ANDID<7GOTO1160
DA 1150 GOSUB2980:CH=ID
HM 1160 NEXT
CP 1170 ID=1:GOSUB2980:CH=ID
QH 1180 GOSUB300:IFID>3ANDID<7
    GOTO1180
RJ 1190 IFID<>128THENGOSUB2980
    :CH=ID:GOTO1180
KE 1200 FORI=1TO5:SPRITEI,0:NE
    XT
SX 1210 SCNCLR
EM 1220 ONCHGOSUB1540,1620,169
    0,,,,,1770,1840
BS 1230 GOSUB2010
JE 1240 GOSUB2710
BB 1250 SLEEP1
QC 1260 GOSUB2120
HX 1270 C=0
BX 1280 VOL15
CG 1290 DO WHILE SG(C)<128ANDC
    <SE
AK 1300 C=C+1
PD 1310 ID=SG(C)
AP 1320 GOSUB1910
SC 1330 LOOP
CR 1340 GOSUB2360
SE 1350 GOTO490
MX 1360 REM PERFORMANCE
RB 1370 ONCHGOSUB1540,1620,169
    0,,,,,1770,1840
FJ 1380 GOSUB2010
DS 1390 GOSUB2710
CP 1400 GOSUB300:IFID<>128GOTO
    1400
PR 1410 GOSUB2120
MS 1420 GOSUB3140
SK 1430 C=0
GJ 1440 VOL15
MR 1450 DO
BG 1460 GOSUB300
ME 1470 GOSUB1910
DH 1480 C=C+1:IFC>SEGOTO1500
RG 1490 SG(C)=ID
RF 1500 LOOP UNTIL ID=128
GH 1510 GOSUB2360
GB 1520 GOTO490
SX 1530 REM CAT
FK 1540 S=13:SC=9:M1=10:M2=2:R
    S=1590
DH 1550 ENVELOPE 0,5,3,8,3,0
FD 1560 ENVELOPE 1,6,0,5,2,2,4
    000
DQ 1570 ENVELOPE 2,10,3,10,8,2
    ,450
XF 1580 RETURN
XH 1590 DATA "V1 03 T0 C V2 T1
    C V3 T2 C","V1 03 T0
    {SPACE}D V2 T1 D V3 T2
    D","V1 03 T0 E V2 T1
    {SPACE}E V3 T2 E","V1
    {SPACE}03 T0 F V2 T1 F
    V3 T2 F"
JR 1600 DATA "V1 03 T0 G V2 T1
    G V3 T2 G","V1 03 T0
    {SPACE}A V2 T1 A V3 T2
    A","V1 03 T0 B V2 T1
    {SPACE}B V3 T2 B","V1
    {SPACE}04 T0 C V2 T1 C
    V3 T2 C"
HQ 1610 REM MOUSE
KR 1620 S=19:SC=10:M1=9:M2=11:
    RS=1660
FR 1630 ENVELOPE 0,5,3,15,1,2,
    200
BS 1640 ENVELOPE 1,7,0,8,0,4
SK 1650 RETURN
GQ 1660 DATA "V1 05 T0 C V2 T1
    C","V1 05 T0 D V2 T1
    {SPACE}D","V1 05 T0 E
    {SPACE}V2 T1 E","V1 05
    T0 F V2 T1 F"
FE 1670 DATA "V1 05 T0 G V2 T1
    G","V1 05 T0 A V2 T1
    {SPACE}A","V1 05 T0 B
    {SPACE}V2 T1 B","V1 06
    T0 C V2 T1 C"
CE 1680 REM PARROT
BC 1690 S=25:SC=7:M1=8:M2=11:R
    S=1740
XB 1700 ENVELOPE 0,1,6,7,0,2,1
    600
HX 1710 ENVELOPE 1,3,2,5,2,4
GA 1720 ENVELOPE 2,15,6,15,9,2
    ,1400
CQ 1730 RETURN
GC 1740 DATA "V1 05 T0 C V2 01
    T1 C V3 05 T2 C","V1
    {SPACE}05 T0 D V2 01 T
    1 D V3 05 T2 D","V1 05
    T0 E V2 01 T1 E V3 05
    T2 E","V1 05 T0 F V2
    {SPACE}01 T1 F V3 05 T
    2 F"
QS 1750 DATA "V1 05 T0 G V2 01
    T1 G V3 05 T2 G","V1
    {SPACE}05 T0 A V2 01 T
    1 A V3 05 T2 A","V1 05
    T0 B V2 01 T1 B V3 05
    T2 B","V1 06 T0 C V2
    {SPACE}02 T1 C V3 06 T
    2 C"
AH 1760 REM FROG
BD 1770 S=1:SC=6:M1=14:M2=2:RS
    =1810
JM 1780 ENVELOPE 0,0,0,15,1,1
KB 1790 ENVELOPE 1,5,15,15,8,4
EA 1800 RETURN
BD 1810 DATA "V1 01 T0 C V2 T1
    C","V1 01 T0 D V2 T1
    {SPACE}D","V1 01 T0 E
    {SPACE}V2 T1 E","V1 01
    T0 F V2 T1 F"
FP 1820 DATA "V1 01 T0 G V2 T1
    G","V1 01 T0 A V2 T1
    {SPACE}A","V1 01 T0 B
    {SPACE}V2 T1 B","V1 02
    T0 C V2 T1 C"
QF 1830 REM PIG
FJ 1840 S=7:SC=11:M1=3:M2=13:R
    S=1880
QJ 1850 ENVELOPE 0,5,3,8,3,2,3
    75
KA 1860 ENVELOPE 1,10,0,5,0,2,
    3900
KH 1870 RETURN
MQ 1880 DATA "V1 01 T0 C V2 T1
    C","V1 01 T0 D V2 T1
    {SPACE}D","V1 01 T0 E
    {SPACE}V2 T1 E","V1 01
    T0 F V2 T1 F"
RE 1890 DATA "V1 01 T0 G V2 T1
    G","V1 01 T0 A V2 T1
    {SPACE}A","V1 01 T0 B
    {SPACE}V2 T1 B","V1 02
    T0 C V2 T1 C"
AF 1900 REM PLAY NOTE & MOVE A
    NIMAL
FG 1910 IFID=128THENRETURN
CG 1920 IFID=0THENFORI=1TO75:N
    EXT:RETURN
EP 1930 SPRSAVAN$(1),ID
SK 1940 PLAYV$(ID)
MK 1950 FORI=2TO6
PG 1960 FORJ=1TO30:NEXT
MC 1970 SPRSAVAN$(I),ID
CS 1980 NEXT
KX 1990 RETURN
EP 2000 REM READ SELECTED ANIM
    AL'S DATA
BQ 2010 C=0
SQ 2020 FORI=STOS+5
RG 2030 C=C+1
JR 2040 AN$(C)=ZUS(I)
RA 2050 NEXT
RD 2060 RESTORE RS
CC 2070 FORI=1TO8
QX 2080 READV$(I)
BE 2090 NEXT
MC 2100 RETURN
EA 2110 REM TURN ON SPRITES &
    {SPACE}OPEN CURTAIN
AG 2120 SPRCOLORM1,M2
FJ 2130 RESTORE2200
BG 2140 FORI=1TO8
BA 2150 READX,Y
XM 2160 SPRSAVAN$(6),I
EC 2170 MOVSPRI,X,Y
CP 2180 SPRITEI,1,SC,1,0,0,1
PM 2190 NEXT
XJ 2200 DATA172,88,212,96,252,
    120,212,144,172,152,13
    2,144,92,120,132,96
KQ 2210 FORI=19TO2STEP-1
HH 2220 FORJ=2TO18
SJ 2230 CHAR,I,J,ST$((I-2)*17+
    J-1)
FK 2240 CHAR,39-I,J,ST$((37-I)
    *17+J-1)
AK 2250 NEXTJ
AH 2260 GOSUB2640

```



```

DU 2270 NEXTI
GM 2280 SOUND1,50000,180,2,350
    00,30,3
SR 2290 SOUND2,50000,180,2,250
    0,7000,3
GE 2300 FORI=5TO0STEP-1
HQ 2310 VOLI
FE 2320 FORJ=1TO250
GP 2330 NEXTJ,I
PC 2340 RETURN
HD 2350 REM CLOSE CURTAIN
MQ 2360 GOSUB2640
PK 2370 X=INT(RND(1)*6+1)*4
QP 2380 IFPEEK(1869+X)=64THENP
    C$="*P{DOWN}{2 LEFT}QR
    ":PO$="{RIGHT}{DOWN}S"
    :GOTO2400
FX 2390 PC$="TG{DOWN}{2 LEFT}U
    I":PO$="{DOWN}V"
CR 2400 COLOR5,15:CHAR,5+X,21,
    PC$
HS 2410 GOSUB2640
DB 2420 FORI=1TO5
PE 2430 CHAR,5+X,21,PO$
XD 2440 GOSUB2640
CX 2450 CHAR,5+X,21,PC$
QJ 2460 FORJ=1TO100
RF 2470 NEXTJ,I
KE 2480 IFPEEK(1869+X)=64THENC
    HAR,5+X,21,"*A{DOWN}
    {2 LEFT}BC":GOTO2500
BJ 2490 CHAR,5+X,21,"FG{DOWN}
    {2 LEFT}HI"
AE 2500 FORI=2TO18
XE 2510 FORJ=2TO17
BQ 2520 CHAR,I,J,"{RED}@J"
KG 2530 CHAR,38-I,J,"K@"
QP 2540 NEXTJ
GR 2550 CHAR,I,J,"FH"
BR 2560 CHAR,38-I,J,"IG"
CP 2570 GOSUB2640
DQ 2580 NEXTI
RJ 2590 FORI=1TO8:SPRITEI,0:NE
    XT
DM 2600 GOSUB2280
HF 2610 SLEEP1
AF 2620 RETURN
KB 2630 REM SOUND OF APPLAUSE
ES 2640 FILTER2000,1,0,0,0
JJ 2650 VOL5
BK 2660 SOUND1,50000,60,2,3500
    0,30,3
JX 2670 SOUND2,50000,60,2,2500
    ,7000,3
JC 2680 IFRND(1)>.85THENSOUND3
    ,55000,55,2,35000,2000
    ,2,2000
XP 2690 RETURN
DK 2700 REM DRAW STAGE & AUDIE
    NCE
GE 2710 FAST
GQ 2720 PRINT"{CLR}{RED}@@@@@
    @@@@@@@@@@@@@@@@@@@@@@
    @@@@@@@@@@@@@@FFFFFFFFF
    FFFFFFFFFFFFFFFFFFFFFFFF
    FFFFFFFF";
EB 2730 FORI=1TO16
KH 2740 PRINT"@@@@@@@@@@@@@@@@
    @@@JK@@@@@@@@@@@@@@@@
    @@";
RX 2750 NEXT
XJ 2760 PRINT"FFFFFFFFFFFFFFFF
    FFFHIGGGGGGGGGGGGGGGG
    GG"
XC 2770 PRINT"{8}CBAEZ{@@@Z{@@
    @Z{@@@Z{@@@Z{@@@Z{@@@Z
    {@ABC"
PX 2780 FORI=1TO8
CR 2790 IFRND(1)>.5THENP$="{7}
    .*A{DOWN}{2 LEFT}BC":GO
    TO2810
SQ 2800 P$="{7}FG{DOWN}
    {2 LEFT}HI"

```

```

BX 2810 CHAR,1+I*4,21,P$
RD 2820 NEXT
RF 2830 CHAR,3,22,"*A{DOWN}
      {2 LEFT}BEEF"
QR 2840 FORI=1TO7
XB 2850 IFRND(1)>.5THENP$="*A
      {DOWN}{2 LEFT}DEEE":GO
      TO2870
MA 2860 P$="FG{DOWN}{2 LEFT}JK
      EE"
RA 2870 CHAR,3+I*4,22,P$
DG 2880 NEXT
RC 2890 CHAR,35,22,"FG{DOWN}
      {2 LEFT}JI"
DR 2900 CHAR,2,24,"LEEO"
SB 2910 FORI=1TO7
HR 2920 CHAR,2+I*4,24,"NEEO"
SJ 2930 NEXT
CG 2940 CHAR,34,24,"NEEM"
EQ 2950 SLOW
PM 2960 RETURN
RF 2970 REM POSITION ARROW
PG 2980 FORJ=0TO1
DE 2990 IFJ=0THENTP=CH:COLOR5,
      12
JR 3000 IFJ=1THENTP=ID:COLOR5,
      16
QM 3010 ONTPGOTO3030,3040,3050
      ,3060,3070,3080,3090,3
      100
PR 3020 GOTO3110
AP 3030 CHAR,19,7,"£":GOTO31
      10
JB 3040 CHAR,22,8,"↑":GOTO3110
CM 3050 CHAR,24,10,"←":GOTO311
      0
FS 3060 CHAR,22,12,"I":GOTO311
      0
KH 3070 CHAR,19,13,"#$":GOTO31
      10
RB 3080 CHAR,17,12,"%":GOTO311
      0
BH 3090 CHAR,15,10,"&":GOTO311
      0
DA 3100 CHAR,17,8,"'"
QQ 3110 NEXTJ
KC 3120 RETURN
MC 3130 REM CLEAR KEYBOARD BUF
      FER
MH 3140 FORI=842TO851
GC 3150 POKEI,0
RG 3160 NEXT
FM 3170 POKE208,0
XK 3180 RETURN
XS 3190 REM TITLE SCREEN
KM 3200 SCNCLR
FR 3210 RESTORE3310
GX 3220 COLOR5,11
BS 3230 FORI=1TO19
MB 3240 READX,A$
JR 3250 CHAR,X,Y,A$
HX 3260 NEXT
SG 3270 COLOR5,15
GD 3280 REM
PD 3290 REM
PX 3300 RETURN
FX 3310 DATA12,"{RVS}
      {9 SPACES}",12,"{RVS}
      {9 SPACES}",14,"{RVS}
      {5 SPACES}",14,"{RVS}
      {5 SPACES}{G3}{RIGHT}
      {2 SPACES}{G3}{2 0}"
AP 3320 DATA14,"{RVS}
      {5 SPACES}{G3}
      {4 SPACES}{G3}
      {2 SPACES}",14,"{RVS}
      {5 SPACES}{G3}{RIGHT}
      {2 SPACES}{G3}{2 T}",6
      ,"{RVS}{£*}",5,"{RVS}
      {£{2 SPACES}{£*}",4,"
      {RVS}{£{4 SPACES}{£*}",
      3,"{RVS}{£{2 SPACES}
      {2 I}{2 SPACES}{£*}

```

```

[2 SPACES][*]
[2 SPACES][G]
[2 SPACES][M]
[2 SPACES][*]
[2 SPACES][RIGHT]
[RIGHT][2 SPACES]
[2 RIGHT]
[*][OFF]
[RVS][G]
FH 3330 DATA2,"[RVS]
[3 SPACES][OFF]
[RVS][3 SPACES]M
[4 SPACES][RIGHT]
[2 SPACES][RIGHT]
[6 SPACES][D][F][*]
[2 SPACES][2 RIGHT]
[OFF][*][RVS][T][*]
",1,"[RVS][4 SPACES]
[2 I][4 SPACES]M[OFF]
[*][RVS][2 SPACES][G]
[2 SPACES][M]
[2 SPACES][OFF][*]
[RVS][2 SPACES][G][D]
[F] M[2 SPACES][M]
[OFF][*][RVS]
[2 SPACES][OFF]
AS 3340 DATA9,"[RVS]
[5 SPACES][*]",8,"
[RVS][7 SPACES][*]",
8,"[OFF][*][RVS]
[4 SPACES][2 T][*]",9,
"[OFF][*][RVS][2 @]
[4 SPACES]M [RIGHT]
[M][3 SPACES][*][G]
[SPACE][*] [M]",8,"
[OFF][*][RVS]
[7 SPACES]N[3 SPACES]
[M][2 SPACES][RIGHT]
[2 SPACES][G]
[4 SPACES][M]",9,"
[OFF][*][RVS]
[5 SPACES][OFF][RVS]
[G][RIGHT] [M][OFF]
[*][RVS][3 SPACES]
[OFF][RVS][G][OFF]
[*][RVS] [M][OFF]"
SM 3350 REM READ SPRITE DATA
JR 3360 RESTORE 3820
SQ 3370 FORI=0TO24STEP6
GJ 3380 FORJ=3584TO3967
RB 3390 READK
DE 3400 POKEJ,K
QB 3410 NEXTJ
FB 3420 FORJ=1TO6
HP 3430 SPRSAVJ,ZU$(I+J)
HD 3440 NEXTJ
PC 3450 NEXTI
GJ 3460 RETURN
RF 3470 REM READ CHARACTER DAT
A
FP 3480 RESTORE4480
CE 3490 FORI=0TO93
MF 3500 FORJ=0TO7
BH 3510 READK
CM 3520 POKEB192+(I*8)+J,K
QK 3530 NEXTJ
AK 3540 NEXTI
KS 3550 RETURN
HM 3560 FAST
RA 3570 FORI=1TOSE:SG(I)=INT(R
ND(1)*9):NEXT
FK 3580 RESTORE 3620
FX 3590 FORI=1TO2:FORJ=1TO8
AH 3600 READAP(I,J)
CP 3610 NEXTJ,I
BH 3620 DATA19,7,22,8,24,10,22
,12,19,13,17,12,15,10,
17,8
XX 3630 RESTORE3700
BJ 3640 FORI=1TO612
HR 3650 READST$(I)
BB 3660 NEXTI

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```

FQ 5000 DATA 224,0,51,121,204,
252,204,0
RB 5010 DATA 3,3,51,227,195,19
5,195,7
KS 5020 DATA 1,3,6,13,27,55,11
1,223
AM 5030 DATA 255,0,255,255,255
,255,255,255
GA 5040 DATA 128,192,96,176,21
6,236,246,251
JF 5050 DATA 184,176,179,176,1
84,190,176,176
HR 5060 DATA 64,64,243,243,115
,115,115,243
PF 5070 DATA 206,134,134,50,50
,134,134,206
KJ 5080 DATA 29,13,77,77,13,29
,125,125
SB 5090 DATA 223,111,55,27,13,
6,3,1
AE 5100 DATA 255,255,255,255,2
55,255,0,255
RC 5110 DATA 251,246,236,216,1
76,96,192,128
GK 5120 DATA 7,15,31,31,63,63,
63,63
FQ 5130 DATA 224,240,248,248,2
52,252,252,252
CE 5140 DATA 63,31,31,15,15,15
,31,127
BD 5150 DATA 252,248,248,240,2
40,240,248,254
KM 5160 DATA 63,31,159,79,175,
79,31,127
GA 5170 DATA 252,249,250,241,2
42,241,248,254
SG 5180 DATA 0,0,7,15,31,31,63
,63
GX 5190 DATA 0,0,224,240,248,2
48,252,252
DX 5200 DATA 63,63,63,63,255,1
27,15,63
GK 5210 DATA 252,252,252,252,2
55,254,240,252
AM 5220 DATA 63,63,191,63,255,
127,15,63
KQ 5230 DATA 252,253,252,252,2
55,254,240,252
HC 5240 DATA 0,0,10,21,42,85,4
2,85
SS 5250 DATA 0,0,168,84,170,84
,170,84
BG 5260 DATA 170,64,138,21,42,
85,42,85
RG 5270 DATA 170,1,168,84,170,
84,170,84
XA 5280 DATA 224,248,252,248,2
00,248,236,254
FH 5290 DATA 63,63,31,31,15,7,
31,127
KF 5300 DATA 248,248,248,248,1
92,224,248,254
DG 5310 DATA 248,248,224,248,2
48,224,248,254
CF 5320 DATA 0,0,3,15,31,63,63
,31
CE 5330 DATA 19,51,63,31,31,31
,7,63
XP 5340 DATA 19,51,63,31,7,31,
7,63
XS 5350 DATA 3,31,62,112,96,96
,224,192
RG 5360 DATA 255,255,0,0,243,2
19,243,219
RJ 5370 DATA 255,255,0,0,224,0
,207,0
AP 5380 DATA 192,248,124,14,6,
6,7,3
KQ 5390 DATA 96,96,112,62,31,3
,0,0
XA 5400 DATA 0,0,0,0,255,255,0
,0
FM 5410 DATA 6,0,48,60,255,255
,60,48

```

```

MH 5420 REM READ ERROR CHANNEL
KC 5430 END
EB 5440 IFDS=62ORDS=63THENPRIN
T"[BLK]"DS$:RETURN
KD 5450 IFDS=0THENRETURN
DJ 5460 PRINTDS$:STOP

```

128 Quicksort

See instructions in article on page 86 before typing in.

Program 1: Quicksort 128

```

1300:4C 23 13 00 00 00 00 00 77
1308:00 00 00 00 00 00 00 2E
1310:00 00 00 00 00 00 00 36
1318:00 00 00 00 00 00 00 3E
1320:00 00 00 20 5C 79 20 D7 29
1328:77 20 15 88 A5 16 8D 18 F5
1330:13 A5 17 8D 19 13 20 5C B6
1338:79 20 EF 77 A5 49 8D 03 09
1340:13 A5 4A 8D 04 13 20 0B 33
1348:17 20 A8 17 A5 FA F0 01 84
1350:60 A2 01 8E 10 13 8E 0C 4E
1358:13 CA 8E 11 13 8E 0D 13 9D
1360:20 F8 15 AD 18 13 8D 1E 98
1368:13 AD 19 13 8D 1F 13 20 07
1370:14 16 20 C3 15 20 D9 15 58
1378:38 AD 10 13 E9 01 8D 10 D7
1380:13 AD 11 13 E9 00 8D 11 6A
1388:13 AD 20 13 8D 0C 13 AD 49
1390:21 13 8D 0D 13 AD 1E 13 2D
1398:8D 0A 13 AD 1F 13 8D 0B B0
13A0:13 18 AD 20 13 6D 1E 13 AB
13A8:85 FA AD 21 13 6D 1F 13 B7
13B0:4A 85 FB 66 FA 20 76 17 9F
13B8:AD 0C 13 85 FA AD 0D 13 2F
13C0:85 FB 20 AD 16 AD 22 13 46
13C8:C9 02 D0 06 20 88 14 4C 66
13D0:B8 13 AD 0A 13 85 FA AD C0
13D8:0B 13 85 FB 20 AD 16 AD 4B
13E0:22 13 C9 01 D0 06 20 9A 9F
13E8:14 4C D2 13 AD 0C 13 8D 09
13F0:12 13 AD 0D 13 8D 13 13 73
13F8:AD 0A 13 8D 14 13 AD 0B 07
1400:13 8D 15 13 20 89 16 AD E9
1408:22 13 C9 01 F0 0C 20 04 4B
1410:15 20 88 14 20 9A 14 4C FC
1418:B8 13 AD 1E 13 8D 14 13 03
1420:AD 1F 13 8D 15 13 20 89 E0
1428:16 AD 22 13 C9 02 D0 17 4B
1430:18 AD 10 13 69 01 8D 10 7D
1438:13 AD 11 13 69 00 8D 11 20
1440:13 20 F8 15 20 14 16 AD 95
1448:0A 13 8D 1E 13 AD 0B 13 46
1450:8D 1F 13 AD 20 13 8D 12 BE
1458:13 AD 21 13 8D 13 13 AD 57
1460:1E 13 8D 14 13 AD 1F 13 EF
1468:8D 15 13 20 89 16 AD 22 23
1470:13 C9 02 D0 03 4C 89 13 51
1478:AD 10 13 D0 05 AD 11 13 FE
1480:F0 03 4C 72 13 85 FA 60 97
1488:18 AD 0C 13 69 01 8D 0C 51
1490:13 AD 0D 13 69 00 8D 0D F3
1498:13 60 38 AD 0A 13 E9 01 B5
14A0:8D 0A 13 AD 0B 13 E9 00 C7
14A8:8D 0B 13 60 20 D0 14 A9 D8
14B0:47 A2 01 A0 00 20 74 FF B8
14B8:8D 09 13 A9 47 A2 01 C8 76
14C0:20 74 FF 85 FE A9 47 A2 3E
14C8:01 C8 20 74 FF 85 FF 60 65
14D0:A5 FA 0A 85 47 A5 FB 2A 17
14D8:85 48 18 A5 47 65 FA 85 7E
14E0:47 A5 48 65 FB 85 48 18 14
14E8:A5 47 6D 03 13 85 47 A5 76
14F0:48 6D 04 13 85 48 38 A5 AD
14F8:47 E9 03 85 47 A5 48 E9 43
1500:00 85 48 60 AD 0A 13 85 DB
1508:FA AD 0B 13 85 FB 20 AC B6
1510:14 A5 47 8D 05 13 A5 48 77
1518:8D 06 13 AD 09 13 8D 07 7E

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1520:13 A5 FE 8D 0E 13 A5 FF FD
1528:8D 0F 13 AD 0C 13 85 FA CC
1530:AD 0D 13 85 FB 20 AC 14 FC
1538:AD 05 13 85 FA AD 06 13 E2
1540:85 FB A9 FA 8D B9 02 AD 16
1548:09 13 A2 01 A0 00 20 77 DC
1550:FF A5 FE A2 01 C8 20 77 D0
1558:FF A5 FF A2 01 C8 20 77 F8
1560:FF A9 47 8D B9 02 AD 07 EE
1568:13 A2 01 A0 00 20 77 FF 5E
1570:AD 0E 13 A2 01 C8 20 77 64
1578:FF AD 0F 13 A2 01 C8 20 07 EB
1580:77 FF 60 20 97 15 20 97 5D
1588:15 38 A5 FA E9 02 85 FA 0D
1590:A5 FB E9 00 85 FB 60 18 BE
1598:A5 FA 6D 10 13 85 FA A5 4D
15A0:FB 6D 11 13 85 FB 60 AD 02
15A8:1A 13 85 FA AD 1B 13 85 8A
15B0:FB 20 83 15 EA EA EA 60 DB
15B8:AD 1C 13 85 FA AD 1D 13 57
15C0:4C AF 15 20 A7 15 A9 FA 81
15C8:A2 01 A0 00 20 74 FF 8D F8
15D0:20 13 20 EF 15 8D 21 13 07
15D8:60 20 B8 15 A9 FA A2 01 23
15E0:A0 00 20 74 FF 8D 1E 13 2C
15E8:20 EF 15 8D 1F 13 60 A9 4A
15F0:FA A2 01 C8 20 74 FF 60 21
15F8:20 A7 15 A9 FA 8D B9 02 DD
1600:AD 0C 13 A2 01 A0 00 20 3D
1608:77 FF AD 0D 13 A2 01 C8 64
1610:20 77 FF 60 20 B8 15 A9 E7
1618:FA 8D B9 02 AD 1E 13 A2 2B
1620:01 A0 00 20 77 FF AD 1F 2D
1628:13 A2 01 C8 20 77 FF 60 72
1630:AD 16 13 CD 17 13 D0 06 A4
1638:A9 00 8D 22 13 60 8A 48 84
1640:A5 47 48 A9 80 85 47 A2 FF
1648:08 A9 00 8D 07 13 8D 08 63
1650:13 A5 47 2D 16 13 F0 03 0D
1658:EE 07 13 A5 47 2D 17 13 AA
1660:F0 03 EE 08 13 AD 07 13 94
1668:38 ED 08 13 F0 07 10 0E 30
1670:A9 02 4C 80 16 46 47 CA A6
1678:D0 CF 8A 4C 80 16 A9 01 C7
1680:8D 22 13 68 85 47 68 AA A9
1688:60 AD 13 13 8D 16 13 AD 7C
1690:15 13 8D 17 13 20 30 16 BE
1698:AD 22 13 D0 0F AD 12 13 F9
16A0:8D 16 13 AD 14 13 8D 17 75
16A8:13 20 30 16 60 20 AC 14 BE
16B0:A5 FE 85 FC A5 FF 85 FD 26
16B8:AD 09 13 8D 05 13 F0 3F CE
16C0:20 5C 17 AD 09 13 F0 3D 85
16C8:A0 00 A9 FC A2 01 20 74 18
16D0:FF 8D 16 13 A9 FE A2 01 E3
16D8:20 74 FF 8D 17 13 20 30 80
16E0:16 AD 22 13 F0 01 60 CE 14
16E8:05 13 F0 08 CE 09 13 F0 AC
16F0:14 C8 D0 D6 CE 09 13 D0 72
16F8:06 A9 00 8D 22 13 60 A9 33
1700:02 8D 22 13 60 A9 01 8D 41
1708:22 13 60 18 A5 33 69 01 67
1710:8D 1A 13 A5 34 69 00 8D 1D
1718:1B 13 38 A5 35 ED 1A 13 A2
1720:85 FA A5 36 ED 1B 13 4A 34
1728:85 FB 66 FA 18 AD 1A 13 53
1730:65 FA 8D 1C 13 AD 1B 13 DB
1738:65 FB 8D 1D 13 38 AD 1C 8C
1740:13 E9 26 8D 1C 13 AD 1D B5
1748:13 E9 00 8D 1D 13 38 A5 9E
1750:35 E9 51 85 49 A5 36 E9 4D
1758:00 85 4A 60 A9 49 A2 01 EF
1760:A0 00 20 74 FF 8D 09 13 85
1768:18 A5 49 69 01 85 FE A5 8D
1770:4A 69 00 85 FF 60 20 AC E4
1778:14 A9 49 8D B9 02 AD 09 57
1780:13 A2 01 A0 00 20 77 FF 7A
1788:AD 09 13 D0 01 60 A0 00 0A
1790:A9 FE A2 01 20 74 FF A2 2D
1798:49 8E B9 02 A2 01 C8 20 31
17A0:77 FF CE 09 13 D0 E9 60 05
17A8:38 A5 35 E5 33 8D 12 13 68

```



```

17B0:A5 36 E5 34 8D 13 13 A9 C7
17B8:FF 8D 14 13 A9 00 8D 15 7B
17C0:13 20 89 16 A9 00 85 FA 66
17C8:AD 22 13 C9 01 F0 02 E6 0C
17D0:FA 60 00 00 00 00 00 94

```

Program 2: Quicksort Demo

```

HD 10 BLOAD"SORT128.OBJ",P4864
KM 20 PRINT"[CLR]{DOWN}[WHT]HO
W MANY RANDOM STRINGS TO
CREATE":INPUT N
BQ 30 DIM A$(N):PRINT"[CLR]
[DOWN]CREATING"N"RANDOM
[SPACE]STRINGS":SD=-TI:A
=RND(SD)
FC 40 FORI=1TON:PRINTI;CHR$(14
5):N1=INT(RND(1)*10+1):A
$="":FORJ=1TON1
EG 50 B$=CHR$(INT(RND(1)*26+65
)):A$=A$+B$:NEXT:A$(I)=A
$:NEXT
RA 60 PRINT"[2 DOWN]PRESS ANY
[SPACE]KEY TO START SORT
":GETKEY A$
FX 70 FAST:T1=TI:SYS4864,,,,,N
,A$(1):T2=TI:PRINT"[CLR]
[DOWN]DONE[2 DOWN]":SLOW
JK 80 IFPEEK(250)<>0THENPRINT"
NOT ENOUGH MEMORY TO SOR
T":END
BP 90 MTS=STR$((T2-T1)/60):PRI
NT N"ELEMENTS SORTED IN"
LEFT$(MTS,6)" SECONDS"
DF 100 PRINT"[2 DOWN]PRESS ANY
KEY FOR SORTED LIST
[DOWN]":GETKEY A$:FORI=
1TON:PRINTA$(I):NEXT

```

Bar Charter

Article on page 82.

```

PA 100 N=38:DIMB(N):FORI=1TON:
READT:B=B+T:B(I)=B:NEXT
:REM SET N TO # OF INCR
EMENTS
AD 110 INPUT"[CLR]ACCOUNT NAME
":AN$:AN$=LEFT$(AN$,39)
:PRINT
XQ 120 DATA50,20,-15,25,30,12,
-20,17
XS 130 DATA5,10,13,-9,22,11,10
,-17
XQ 140 DATA10,15,12,-30,-25,-1
0,30,10
FR 150 DATA-10,-25,-16,-27,10,
15,-16,10
QH 160 DATA-15,-16,-12,-20,-10
,12
GP 1000 REM{2 SPACES}BEGIN CHA
RT ROUTINE
HX 1010 POKE53280,0:POKE53281,
0:PRINT"[43]"
FR 1020 L5$="5E38 T3"
KB 1030 L0$="0E38 T3"
XB 1040 INPUT"SET INCREMENT VA
LUE":INC:PRINT"[CLR]"
SS 1050 INC$=STR$(INC):IFLEN(I
NC$)>5THEN1340
CD 1060 IFINC<1THEN1340
PX 1070 PRINT"RELATIVE BALANCE
S. INCREMENTS = $"IN
HE 1080 FORI=1TO39:PRINT"[RVS]
":NEXT:PRINT:PRINT"
[UP][OFF]"
XX 1090 FORI=1TO4:PRINT"[T3]":N
EXT
MH 1100 PRINTL5$:FORI=1TO4:PRI
NT"[T3]":NEXT
AF 1110 PRINTL0$:FORI=1TO4:PRI
NT"[T3]":NEXT

```

```

EB 1120 PRINTL5$:FORI=1TO4:PRI
NT"[T3]":NEXT
BA 1130 VL=22:X=1:A=0
HX 1140 A=A+1:IFA>NTHEN1290
XJ 1150 COL=COL+1:IFCOL>15THEN
COL=1
PP 1160 POKE646,COL
HA 1170 BL=B(A)/INC
CB 1180 IFINC>B(A)THENEM=1:GOT
O1260
MX 1190 IFBL=>20THENEM=2:GOTO1
260
HG 1200 DV=VL-INT(BL)
EF 1210 POKE782,X:POKE781,DV:S
YS65520
SH 1220 PRINT"[K3]"
RK 1230 IFBL<2THEN1250
AP 1240 FORI=1TOBL-1:PRINTTAB(
X)"[K3]":NEXT
SX 1250 X=X+1:GOTO1140
RJ 1260 POKE782,X:POKE781,21:S
YS65520
MX 1270 IFEM=1THENPRINT"<":GOT
O1250
SK 1280 PRINT">":GOTO1250
EP 1290 POKE782,0:POKE781,22:S
YS65520
BG 1300 PRINT"[43]{RVS}
[2 SPACES]<-BELOW SCAL
E[3 SPACES]:[3 SPACES]
>-EXCEEDS RANGE
[2 SPACES]{OFF}"
QE 1310 PRINT"ANY KEY TO EXIT.
.."
XP 1320 GETOP$:IFOP$=" "THEN132
0
BR 1330 END:REM [END CHART ROU
TINE - BRANCH BACK TO
[SPACE]MAIN PROGRAM]
EF 1340 PRINT"[DOWN]UNACCEPTAB
LE VALUE - OUT OF RANG
E[DOWN]":GOTO1040

```

Fast Hi-Res Screen Dump

Article on page 70.

```

GP 10 INPUT"[CLR]{2 DOWN}[WHT]
WHAT IS THE STARTING ADD
RESS":L:LL=L
CD 20 READ A:IFA<0 THEN40
EQ 30 CKSUM=CKSUM+A:POKE LL,A:
LL=LL+1:GOTO20
ME 40 IF CKSUM<> 33095 THEN PR
INT "[CLR]{2 DOWN}ERROR
[SPACE]IN DATA STATEMENT
S":END
QJ 50 PRINT"[CLR]{2 DOWN}HIRES
DUMP INSTALLED":PRINT"
[2 DOWN]SYS"L"TO ACTIVAT
E"
PM 60 DATA 169,0,32,189,255,16
9,4,170
FQ 70 DATA 160,4,32,186,255,32
,192,255,162
GC 80 DATA 4,32,201,255,169,27
,32,210
JJ 90 DATA 255,169,64,32,210,2
55,169,27
SJ 100 DATA 32,210,255,169,65,
32,210,255
GS 110 DATA 169,8,32,210,255,1
62,39,134
AC 120 DATA 250,169,27,32,210,
255,169,75
XJ 130 DATA 32,210,255,169,200
,32,210,255
DS 140 DATA 169,0,32,210,255,1
62,0,134

```

```

ED 150 DATA 251,162,0,134,252,
166,251,134
EK 160 DATA 195,162,0,134,196,
162,6,24
SS 170 DATA 6,195,38,196,202,2
08,249,162
BB 180 DATA 0,134,253,134,254,
162,5,24
AB 190 DATA 165,253,101,195,13
3,253,165,254
SH 200 DATA 101,196,133,254,20
2,208,240,134
SX 210 DATA 196,166,250,134,19
5,162,3,24
SC 220 DATA 6,195,38,196,202,2
08,249,240
CD 230 DATA 4,16,164,208,186,2
4,165,195
EH 240 DATA 101,252,133,195,16
5,196,105,32
KF 250 DATA 133,196,24,165,253
,101,195,133
HP 260 DATA 253,165,254,101,19
6,133,254,160
BH 270 DATA 0,132,195,177,253,
240,10,162
BX 280 DATA 8,74,38,195,202,20
8,250,165
KD 290 DATA 195,32,210,255,166
,252,232,224
XR 300 DATA 8,208,136,166,251,
232,224,25
AM 310 DATA 208,193,169,13,32,
210,255,166
CX 320 DATA 250,202,16,181,32,
204,255
AH 330 DATA 169,4,76,195,255,-
1

```

Video Setup 64

Article on page 66.

```

DC 10 PRINT "64 SCREEN SETUP"
RG 20 DIM S(255)
JR 30 S0=16384
CA 40 PRINT "WANT TO USE:"
EF 50 PRINT "1. CHARACTERS
KA 60 PRINT "2. HIGH RES
CR 70 INPUT "1 OR 2":J8
RH 80 IF J8<1 OR J8>2 GOTO40
SB 90 B3=4:IF J8=2 GOTO160
DM 100 PRINT "DO YOU WANT TO B
UILD
CX 110 PRINT "[3 SPACES]YOUR O
WN CHARACTER SET (Y/N)"
:
QQ 120 INPUT Y$:Y$=LEFT$(Y$,1)
EX 130 IF Y$="Y" GOTO160
FM 140 IF Y$<>"N" GOTO90
EQ 150 B3=0:C=64
EB 160 PRINT
PA 170 PRINT "PICK A MEMORY AR
EA:"
GD 180 FOR J=0 TO 3
EA 190 IF J8=2 OR B3>0 OR J=0
[SPACE]OR J=2 THEN PRIN
T J:": "J*S0;"TO";(J+1
)*S0-1
QC 200 NEXT J
AS 210 PRINT "YOUR CHOICE (0 T
O 3)":IF J8=2 THEN PRI
NT "(1 OR 3 BEST)":
GB 220 INPUT B:IF B<0 OR B>3 G
OTO160
XM 230 IF B=0 THEN FOR J=0 TO
[SPACE]3:S(J)=2:NEXT J
PR 240 IF B=0 OR B=2 THEN FOR
[SPACE]J=64 TO 127:S(J)
=2:NEXT J
DK 250 REM
AB 260 IF J8=1 THEN PRINT "---C
HARACTER SCREEN---":S=32

```



```

BG 270 IF J8=2 THEN PRINT "--H
I RES SCREEN--":S=128
SG 280 ON J8 GOSUB760,800
KM 290 INPUT "ARE YOU READY FO
R DATA":Y$
ED 300 IF LEFT$(Y$,1)<>"Y" GOT
0290
PQ 310 PRINT "{CLR}{2 DOWN}"
BJ 320 PRINT "{5 SPACES}VIDEO
{SPACE}LOCATIONS ";
SQ 330 PRINT
HK 340 IF B5=32 THEN PRINT "HI
GH RESOLUTION."
GS 350 IF J8=1 THEN PRINT "TEX
T SCREEN"
EG 360 PRINT "VIDEO MATRIX: ";B
*S0+V*64;"TO";B*S0+(V+1
6)*64-1
PA 370 PRINT "(SPRITE POINTERS
AT";B*S0+V*64+1016;"TO
";B*S0+V*64+1023;"")"
AR 380 IF J8=1 AND B3=0 THEN P
RINT "STANDARD CHARACTE
R SET.":C=64:GOTO400
SA 390 PRINT "CHARACTER BASE: "
;B*S0+C*64;"TO";B*S0+(C
+S)*64-1
MA 400 PRINT
JR 410 PRINT "POKE 56576, ";MID
$(STR$(7-B),2)
CX 420 PRINT "{4 SPACES}(TO SE
T MEMORY BLOCK)"
KP 430 PRINT "POKE 53272, ";MID
$(STR$(V+C/16),2)
PD 440 PRINT "{4 SPACES}(TO SE
T VM AND CB)"
MM 450 IF J8=1 THEN GOSUB1070
CG 460 PRINT "POKE 53265, ";MID
$(STR$(B5+27),2)
SH 470 IF B5<>0 THEN PRINT "
{4 SPACES}(TO ENABLE HI
RES)"
GE 480 IF B5=0 THEN PRINT "
{4 SPACES}(TO KILL HI R
ES)"
BB 490 INPUT "WILL YOU WANT SP
RITES":Y$
KH 500 IF Y$="N" GOTO590
FG 510 IF Y$<>"Y" GOTO490
SR 520 PRINT "SPRITES MAY BE P
LACED AT: "
QS 530 F=-1
SA 540 FOR J=0 TO 255
JJ 550 IF S(J)=0 AND F=-1 THEN
GOSUB700
PK 560 IF S(J)<>0 AND F<>-1 TH
EN GOSUB730
GM 570 NEXT J
KQ 580 IF F<>-1 THEN GOSUB730
QR 590 PRINT:IF B=3 GOTO630
XP 600 PRINT "CAREFUL: "
PM 610 PRINT "BASIC IS USUALLY
IN 2049 TO 40959"
XQ 620 END
HK 630 S$="SPRITES"
GK 640 FOR J=64 TO 127 STEP 16
EG 650 IF S(J)=0 THEN S$="** W
ARNING! **"+CHR$(13)+"A
DDRESSES"
SA 660 NEXT J
EB 670 PRINT S$;" FROM 53248 T
O 57343 ARE"
XR 680 PRINT "TOUGH TO GET AT"
EB 690 END
JB 700 P=J
XF 710 F=0
FC 720 RETURN
RB 730 PRINT S0*B+P*64;"TO";S0
*B+J*64-1;"(SPRITES";P;
"TO";J-1;"")
KQ 740 F=-1
KE 750 RETURN

```

```

CK 760 REM
XK 770 IF B3>0 THEN PRINT "THE
CHARACTER SET MAY BE A
T":GOSUB840
KD 780 PRINT "VIDEO MATRIX (SC
REEN MEMORY)...":GOSUB9
60
KK 790 RETURN
EX 800 B5=B5+32
CX 810 PRINT "THE HI-RES SCREE
N MAY BE AT":GOSUB840
DB 820 PRINT "VIDEO MATRIX (CO
LOR MEMORY)...":GOSUB96
0
GP 830 RETURN
FQ 840 N=0:FOR J=0 TO 255 STEP
S
BX 850 IF S(J)>T OR S(J+S-1)>T
GOTO870
MG 860 PRINT "(",J/S,")";B*S0+
J*64;"TO";B*S0+(J+S)*64
-1:N=N+1:C=J/S
ER 870 NEXT J
KM 880 IF N<2 GOTO920
XR 890 PRINT "YOUR CHOICE (0 T
O";(J-S)/S,")";
MC 900 INPUT C0:IF C0<0 OR C0>
C GOTO840
BR 910 C=C0
SF 920 C=C*S
EA 930 FOR J=C TO C+S-1:S(J)=3
:NEXT J
BC 940 PRINT
CD 950 RETURN
CR 960 FOR J=0 TO 255 STEP 16
HF 970 IF S(J)>T OR S(J+15)>T
{SPACE}GOTO990
GG 980 PRINT "(",J/16,")";B*S0
+J*64;"TO";B*S0+(J+16)*
64-1:V=J/16
JF 990 NEXT J
MA 1000 PRINT "YOUR CHOICE (0
{SPACE}TO";V,")";
MK 1010 INPUT C0:IF C0<0 OR C0>
V GOTO1000
JF 1020 V=C0
PK 1030 V=V*16
DH 1040 FOR J=V TO V+15:S(J)=3
:NEXT J
KX 1050 PRINT
FC 1060 RETURN
BB 1070 PRINT "POKE 648, ";MID$
(STR$(B*64+V/4),2)
GD 1080 PRINT "{4 SPACES}(TO C
ONNECT 'PRINT') "
QE 1090 RETURN

```

```

RH 90 J$="{20 SPACES}{20 LEFT}
"
AK 100 OPEN 2,8,2,F1$:OPEN 3,8
,3,F2$:GOSUB650
EG 110 FOR=1TO2:GET#2,A$:GET#
3,B$:NEXT:REM{2 SPACES}
THROW AWAY FIRST 2 BYTE
S
KB 120 FOR=1TO2:GET#2,A$:GET#
3,B$:NEXT:REM{2 SPACES}
THROW AWAY LINE LINKS
JE 130 A=0:IFA$<>" "THENA=ASC(A
$)
AA 140 B=0:IFB$<>" "THENB=ASC(B
$)
EQ 150 IF A=0 AND B=0 THEN300
BX 160 IFA=0THENLA=64000:GOTO1
80
PG 170 GOSUB480:REM GET LINE N
UMBER
DG 180 IFB=0THENLB=64000:GOTO2
00
AH 190 GOSUB520:REM GET LINE N
UMBER
JB 200 IFLA<>LB THEN GOSUB320:
REM{2 SPACES}CHECK FOR
{SPACE}DIFFERENT LINE #
XF 210 IFLA=64000ANDLB=64000TH
EN300
BA 220 PRINT"CHECKING LINE"LA:
PRINT"UP";
RF 230 SYS SA
SF 240 IF PEEK(FR+1)=0 THEN120
XP 250 PRINT J$ "LINES"LA"DO N
OT AGREE. "
DC 260 IF SP$<>"Y" THEN120
AG 270 IF TG=1 THEN PRINT#4
GP 280 TG=0:PRINT#4,"LINES"LA"
DO NOT AGREE. "
GE 290 GOTO120
RA 300 CLOSE2:CLOSE3:CLOSE4:EN
D
EQ 310 REM --{37 SPACES}EXTRA
{SPACE}LINE
JJ 320 IF LA>LB THEN390
BX 330 PRINT J$ "LINE"LA"IN
{RVS} "F1$" {OFF} NOT I
N {RVS} "F2$". "
SC 340 IF SP$="Y" AND TG=0 THE
N PRINT#4
BK 350 TG=1:IF SP$="Y" THEN PR
INT#4,"LINE"LA"IN "F1$"
NOT IN "F2$". "
QA 360 POKE FR,2:SYS SA+55
CF 370 GET#2,A1$:GET#2,A2$:IF
{SPACE}A1$=" " AND A2$="
" THEN LA=64000:GOTO320
PQ 380 GOSUB480:GOTO320:REM GE
T NEW LINE #
RX 390 IF LB>LA THEN460
XP 400 PRINT J$ "LINE"LB"IN
{RVS} "F2$" {OFF} NOT I
N {RVS} "F1$". "
XS 410 IF SP$="Y" AND TG=0 THE
N PRINT#4
GD 420 TG=1:IF SP$="Y" THEN PR
INT#4,"LINE"LB"IN "F2$"
NOT IN "F1$". "
AP 430 POKE FR,3:SYS SA+55
RH 440 GET#3,B1$:GET#3,B2$:IFB
1$=" "ANDB2$=" "THENLB=64
000:GOTO320
FX 450 GOSUB520:GOTO320
KD 460 RETURN
MR 470 REM -- GET LINE NUMBERS
AF 480 GET#2,A1$:GET#2,A2$
BQ 490 A1=0:IFA1$<>" "THENA1=AS
C(A1$)
AJ 500 A2=0:IFA2$<>" "THENA2=AS
C(A2$)
BD 510 LA=A2*256+A1:RETURN

```

Power BASIC: Program Mis-Matcher

Article on page 108.

Program 1: 64/128 Program Mis-Matcher

```

KJ 10 SA=49152:CS=10600:FR=251
:PRINT "{CLR}{WHT}"
SM 20 FOR=SATOSA+65:READA:X=X
+A:POKET,A:NEXT
JH 30 IFX<>CSTHENPRINT"ERROR I
N DATA STATEMENTS.":STOP
GG 40 PRINTCHR$(14)
CA 50 INPUT"NAME OF FIRST PROG
RAM ";F1$:INPUT"NAME OF
{SPACE}SECOND PROGRAM";F
2$
RB 60 PRINT"{CLR}OUTPUT TO PRI
NTER?{2 SPACES}Y/N"
EQ 70 GET SP$:IFSP$=" " THEN70
GX 80 IFSP$="Y"THEN OPEN 4,4,7
:PRINT#4,"COMPARING "F1$
" TO "F2$".":PRINT#4

```



```

PJ 520 GET#3,B1$:GET#3,B2$
BG 530 B1=0:IFB1$<>"THENB1=AS
C(B1$)
DB 540 B2=0:IFB2$<>"THENB2=AS
C(B2$)
XX 550 LB=B2*256+B1:RETURN
QR 560 DATA 169,0,133,252,162,
2,32,198
GM 570 DATA 255,160,255,200,32
,207,255,240
XP 580 DATA 6,153,66,192,76,11
,192,132
SQ 590 DATA 251,162,3,32,198,2
55,160,255
PB 600 DATA 200,32,207,255,240
,10,217,66
QP 610 DATA 192,240,245,230,25
2,76,32,192
DS 620 DATA 196,251,240,2,230,
252,96,166
JF 630 DATA 251,32,198,255,32,
207,255,208
BH 640 DATA 251,96
QQ 650 OPEN15,8,15:INPUT#15,A,
B$,C,D:IFATHENPRINTA,B$,
C,D:STOP
AB 660 RETURN

```

Program 2: Modifications For Plus/4 And 16

```

CC 5 POKE 56,62:CLR
JA 10 SA=15872:CS=9528:FR=159:
PRINT"{CLR}{BLK}"
FX 560 DATA 169,0,133,160,162,
2,32,198
GM 570 DATA 255,160,255,200,32
,207,255,240
KM 580 DATA 6,153,66,62,76,11,
62,132
GJ 590 DATA 159,162,3,32,198,2
55,160,255
PB 600 DATA 200,32,207,255,240
,10,217,66
PM 610 DATA 62,240,245,230,160
,76,32,62
EP 620 DATA 196,159,240,2,230,
160,96,166
DM 630 DATA 159,32,198,255,32,
207,255,208
BH 640 DATA 251,96

```

Mastering 128 Sound And Music

Article on page 88.

Program 1: Custom Envelope

```

HA 10 TEMPO 8:VOL 8:PLAY"X0U9"
RS 20 INPUT"{CLR}{DOWN}DEFAULT
ENVELOPE TO COMPARE (0-
9)";E:IF E<0 OR E>9 THEN
20
EX 30 PRINT"{2 DOWN}{RVS}FOR C
USTOM ENVELOPE{OFF}
{DOWN}":INPUT"ATTACK RAT
E (0-15)";A:IF A<0 OR A>
15 THEN30
EH 40 INPUT"DECAY RATE (0-15)
";D:IF D<0 OR D>15 THEN4
0
RD 50 INPUT"SUSTAIN LEVEL (0-1
5)";S:IF S<0 OR S>15 THE
N50
CE 60 INPUT"RELEASE RATE (0-15
)";R:IF R<0 OR R>15 THEN
60
JG 70 INPUT"WAVEFORM (0-4)";W:
IF W<0 OR W>15 THEN70
FK 80 IF W<>2 THEN100

```

```

KH 90 INPUT"PULSE WIDTH (0-409
5)";P:IF P<0 OR P>4095 T
HEN90
KQ 100 PRINT"{DOWN}PRESS P TO
{SPACE}PLAY AND COMPARE
YOUR CUSTOM:PRINT USI
NG"ENVELOPE TO DEFAULT
{SPACE}ENVELOPE #";E
SP 110 PRINT"{DOWN}PRESS C TO
{SPACE}CHANGE YOUR CUST
OM ENVELOPE:PRINT"
{DOWN}PRESS D TO CHANGE
THE DEFAULT ENVELOPE":
PRINT"FOR COMPARISON"
CJ 120 GET X$:IF X$="P" THEN18
0
HH 130 IF X$="C" THEN PRINT"
{CLR}":GOTO30
KF 140 IF X$="D" THEN160
SP 150 GOTO120
PK 160 INPUT"{CLR}{DOWN}DEFAULT
T ENVELOPE TO COMPARE (
0-9)";E:IF E<0 OR E>9 T
HEN160
EP 170 GOTO100
HB 180 A$="V104QCIDIEFIGIAIBO
5WCQR":B$="V205QCO4IBIA
IGIFIEIDWCQR":PLAY"V1T1
V2T2"
SC 190 PRINT USING"{DOWN}{OFF}
{6 SPACES}THIS IS DEFAU
LT ENVELOPE #";E:T$=STR
$(E):ENVELOPE 0,0,9,0,0
,2,1536
JP 200 PLAY"V1T":PLAY T$:PLAY
{SPACE}A$:PRINT"{UP}
{6 SPACES}{RVS}THIS IS
{SPACE}YOUR CUSTOM ENVE
LOPE":ENVELOPE 0,A,D,S,
R,W,P
QM 210 PLAY"V2T0":PLAY B$:PRIN
T"{UP}{34 SPACES}":GOTO
120

```

Program 2: VF16

```

MB 10 PRINT"{CLR}{5 DOWN}{TAB}
{2 SPACES}VISION FUGITIV
E XVI":PRINT"{5 DOWN}
{2 TAB}{3 SPACES}BY":PRI
NT"{5 DOWN}{TAB}
{3 SPACES}SERGEI PROKOFI
EV"
JS 20 TEMPO 6:ENVELOPE 0,0,9,2
,1,2,1536:PLAY"X0U9":PLA
Y"V1T0V2T0V3T0"
CC 30 A$="V105HEV3QRO4HEV105Q#
DV2HFV1QDV304HE"
BS 40 B$="V105Q#CV2HEV1QCV304H
EV104QB205H#DV105ICV304
HEV1IB"
BS 50 C$="V104Q#FV205HVDV104Q#G
V3HEV1QAV205H#CV104I#AV3
HEV1IB"
EF 60 D$="V105QCV2HCV1I#CV304H
EV105ID.Q#DV204HVB3HEV10
5SES#G":VOL 9:PLAY A$:PL
AY B$:VOL 7:PLAY C$:VOL
{SPACE}9:PLAY D$
QK 70 E$="V105HEV204H#AV3HEV20
5HFV1Q#DQDV304HE":F$="V1
05Q#CV2HEV1QCV304HEV1QB
V205H#DV1ICV304HEV1IB"
QQ 80 G$="V104Q#FV205HVDV104Q#G
V3HEV1QAV205H#CV104I#AV3
HEV1IB"
FQ 90 H$="V105HCV2HCV304HEV2HB
V105HEV304QE"
KX 100 VOL 11:PLAY E$:PLAY F$:
VOL 9:PLAY G$:VOL 7:TEM
PO 5:PLAY H$:TEMPO 6

```

```

HS 110 I$="V303SEV204IGV1IBIRV
303SBSRO4SFV2QDV1QAV3SR
03SBSRO2SAV104IEIRV303S
FSRSBV104QDV3SRO3SFSR"
CS 120 J$=I$:K$="V303SEV104IEI
RV303SBSRO4SFV1QDV3SRO3
SBSRO2SAV204IGV1IBIRV30
3SFSRSBV204QDV1QAV3SRO3
SFSR"
QC 130 L$="V303SEV104IEIRV303S
BSRO4SFV1QDV3SRO3SBSRO2
SAV104HEV3SRO3SFSRSBSR.
IFV2IR"
CB 140 VOL 5:PLAY I$:PLAY J$:P
LAY K$:PLAY L$
AX 150 M$="V2IRV104ICIRV303SAS
RO4SFV1QDV3SRO3SASRSCV2
04IAV105ICIRV303SGSR04S
CV2QEV1QB3V3SRO3SGSR"
EA 160 N$="V303SFV104IDIRV303S
ASRO4SGV1QEV3SRO3SASRSC
V204IBV105IDIRV303SASRO
4SEV2QFV105QCV3SRO3SASR
"
QQ 170 O$="V303HVB104IGIRV2SES
RSDV1QFV2SRICIRV1IBV303
QAV204SCSRSDV3QFV1QAV2S
RIE"
MM 180 P$="V2IRV104IGV303HVB20
4SESRSRV1QFV2SRICIRV1IB
V303QAV204SCSRSDV3QFV1Q
AV2SRIE"
CB 190 PLAY M$:VOL 7:PLAY N$:P
LAY O$:PLAY P$:Q$="V2IR
V104HGV303WBV204SCSRSDS
RIEIRV1HFV2SDSRSCSRID"
GM 200 R$="V204HDV1HGV303SBSRS
ASRSRSGRSFSRHEV204HEHR"
SR 210 S$=A$:T$=B$:PLAY Q$:VOL
5:TEMPO 5:PLAY R$:TEMP
O 6:VOL 9:PLAY S$:PLAY
{SPACE}T$:U$=C$
BJ 220 V$="V105HCV2WCV304WEV10
6.HC":W$="V20RO3QAV3QDV
104QAQGV303QCV2QGVFV302
QBV104QF"
BH 230 X$="V105HEV304QEHEV105Q
#DV2HFV1QDV304HE":PLAY
{SPACE}U$:PLAY V$:VOL 7
:PLAY W$:PLAY X$
QG 240 Y$=T$:Z$=U$:AA$=V$:AB$=
W$:PLAY Y$:PLAY Z$:PLAY
AA$:TEMPO 5:PLAY AB$:A
C$=X$:AD$=Y$
RS 250 AE$="V104Q#FV205HVDV104Q
#GV3HEV1QAV205H#CV104I#
AV3QEV1IB"
CE 260 AF$="V105HCV3QCO4QEQC1
06HEV303QE"
ES 270 VOL 5:PLAY AC$:PLAY AD$
:PLAY AE$:PLAY AF$
JK 280 AG$="V303WEV106WE":AH$=
"V106.WEV205.WEV303.WE"
:PLAY AG$:VOL 3:PLAY AH
$:END

```


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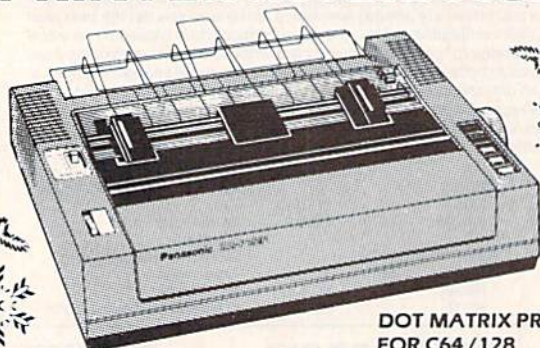
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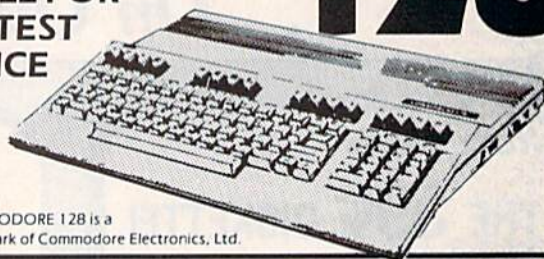


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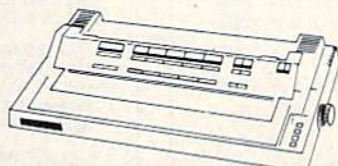
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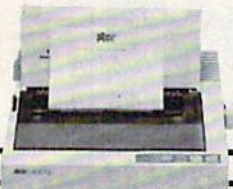
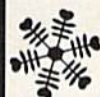
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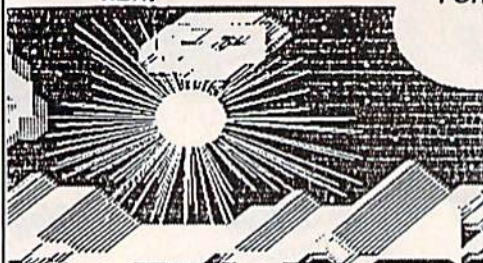
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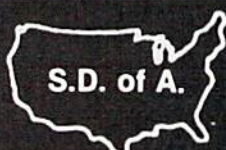
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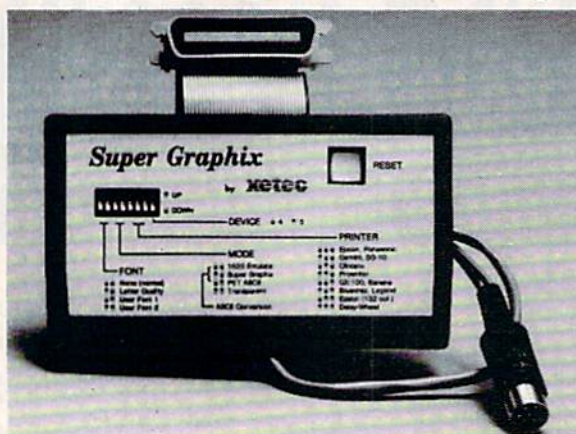
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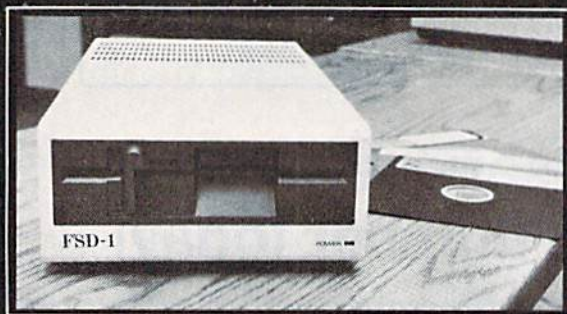
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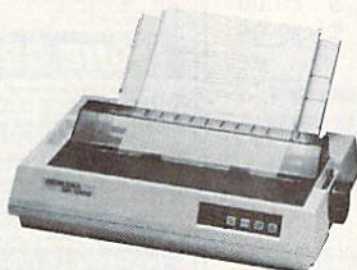
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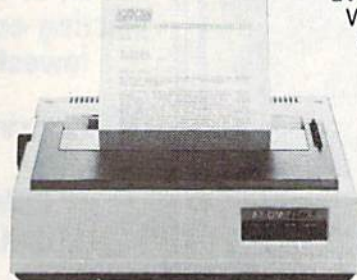
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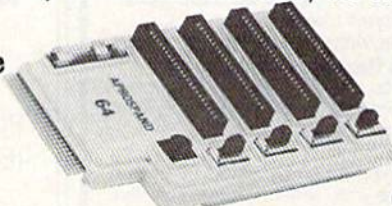


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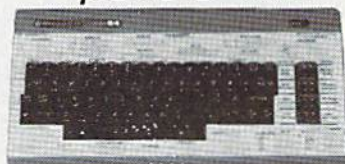


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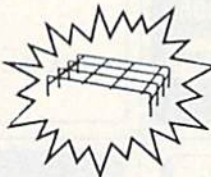
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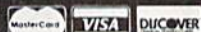
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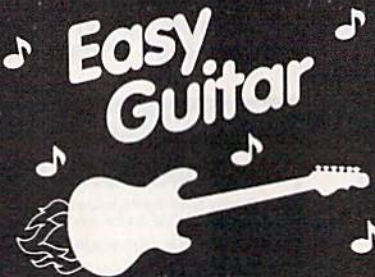
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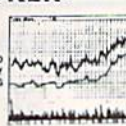
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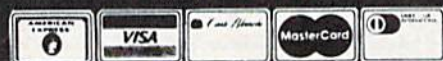
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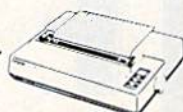
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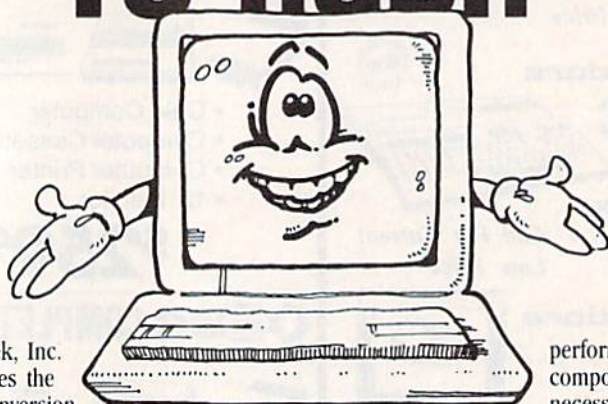
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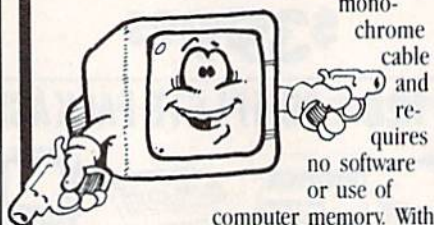
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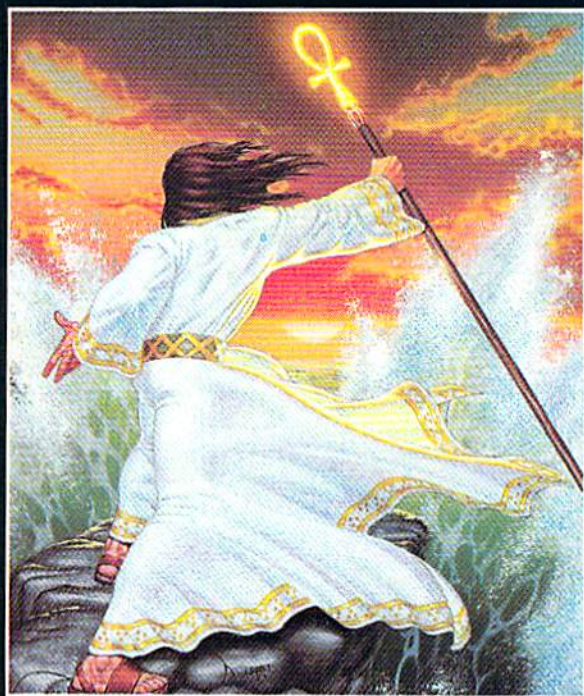
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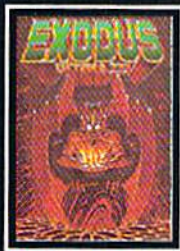
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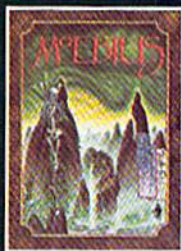
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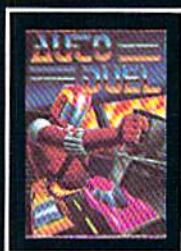
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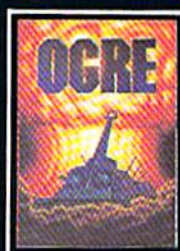
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