



*Lift the lid on
Nestar's toolkit and
have a look inside.*

and I was ready to explore all the BASIC commands now available from the Toolkit in the direct mode.

The Commands

AUTO — provides automatic line numbering as you type in your BASIC program. The general syntax is:
AUTO beginning line number, interval.

If you type in AUTO without specifying any parameters, line numbering will start with 100 and the interval will be 10. To get out of the AUTO mode, just hit the return key without entering anything after the line number.

AUTO also remembers where it left off. If you exit the AUTO mode to do some editing and then type AUTO, numbering will start at the next sequential line in your program. The previously set interval will be maintained. If you type AUTO 200, line numbers will start with 200 and be incremented by the last interval given in the AUTO command.

AUTO helps to ease some of the typing drudgery in entering a BASIC program.

RENUMBER — rennumbers the entire BASIC program presently in memory. All GOTO, ON...GOTO, GOSUB, ON...GOSUB, IF-THEN, RUN and LIST commands are also changed to the new respective reference line. All references to nonexistent line numbers are changed to 63999. This is especially useful when used with the FIND command. The general syntax is:

RENUMBER beginning line number, interval.

If you type RENNUMBER without specifying

In August 1979 I first noticed advertising descriptions of the BASIC Programmer's Toolkit, which claimed to add ten more commands to the Commodore CBM BASIC vocabulary. The commands are: AUTO, DELETE, RENNUMBER, APPEND, DUMP, TRACE, STEP, OFF, FIND and HELP. Since the commands are in firmware (ROM), they will not take up any of my 32K of RAM; they will be there whenever I turn on the computer.

I was eager to have this additional command capability and placed my \$49.95 order for the ROM, which is a product of Palo Alto ICs, a division of Nestar Systems, Inc.

After a short delay, my Toolkit arrived by first-class mail. I eagerly opened the padded mailer to find the ROM placed in a conductive plastic pin carrier, protecting it from the possibility of bent pins and electrostatic damage. Also enclosed was a 34-page book of documentation, professionally printed with a firm, slick cover.

I immediately got the impression that this company cared about what their customers thought about them. At this point I was favorably impressed and developed some confidence in the product and the company.

Installation

The documentation begins with a brief description of the commands and an expla-

nation of the Toolkit installation, followed by a clear and complete description of each command, including examples. Installation in my 32K CBM with a full-size keyboard is a simple matter of opening the case and installing the 2K ROM in one of the three existing empty sockets. Installation on an 8K PET involves plugging a small board containing the ROM and some address decoding into the memory expansion port on the side of the PET. Another small connector with a single wire plugs into the second cassette port to supply 5 V dc to the board.

As the Toolkit manual warns, turn off the power and disconnect the computer from the ac line. Ground yourself by touching the metal case of the computer to dissipate any static charge just prior to handling the Toolkit for installation.

The ROM occupies memory positions B000-B7FF (hex), so if you have other memory expansion systems, such as Skyles or ExpandaPet, be sure to find out — from their respective documentations — the correct socket to plug into. Also, be sure to have the correct orientation of the ROM with respect to pin one.

I installed the ROM and checked for any bent pins. I was now ready to check it out. After powering up my CBM, I entered a BASIC command SYS 45056. This initializes the Toolkit ROM, and the CRT should read: (C) 1979 PAICS. Everything went smoothly,

ing any parameters, renumbering will start with line 100 and the interval will be 10. It took about 30 seconds to renumber a 10K program.

DELETE—removes BASIC lines by specifying the line number or range of line numbers in the same way that the PET/CBM LIST command lists lines. For example, DELETE 50 deletes line 50; DELETE 50-100 deletes lines 50 through 100; DELETE -100 deletes all lines from lowest through 100; and DELETE 100- deletes all lines from 100 through highest.

The Toolkit is designed so that if you type DELETE without giving a range or specific line number you will get SYNTAX ERROR?. This prevents the loss of the entire program by mistake.

APPEND—will load a program from a cassette and add it to the end of a program already in RAM. It works in the same way as the PET/CBM BASIC command LOAD. The general syntax is:

APPEND "program name," cassette drive (1 or 2).

As with the PET/CBM LOAD command, no specification of the cassette drive defaults to cassette drive #1.

APPEND is convenient for adding previously written subroutines to a program in RAM. You could have several often-used subroutines stored on tape and APPEND them to an existing program under development in RAM.

Caution: You must keep the line numbers in order. APPEND will add anything on the tape to the end of the program in the computer. It is a good idea to number all of your subroutines in the 60000-63000 range and not use this range for your BASIC main body programs. This will help to avoid conflicts in duplicate line numbers when appending.

FIND—locates and displays all lines that contain a specified BASIC keyword, section of a BASIC statement or a quoted string constant. The general syntax is:

FIND BASIC code, line number-line number
FIND "string", line number-line number.

The line-number-parameter-search range performs the same as the PET/CBM LIST command range and the Toolkit DELETE command range. If you omit the line number parameters, the whole program will be searched.

FIND allows you to be as specific as necessary when detailing the BASIC statement or string parameters. For example, FIND FOR I will locate and list every line containing FOR I; FIND A will locate and list every line containing the variable A; FIND "THIS" will locate and list every line containing the word THIS; FIND GOTO 100, 10-20 will search lines 10 through 20 and list all lines containing GOTO 100.

As you can see, this proves to be a valuable

time-saver. Recall in the description of RENUMBER that any references to nonexistent line numbers are assigned a value of 63999. Now we can use the statement FIND 63999 to list any bad references in the program.

When you use FIND, the number of lines listed on the CRT may be sufficient to cause scrolling. You may slow down the scrolling by holding down the RVS key or stop it anywhere with the STOP key.

DUMP—displays all the non-array variables in memory. They are displayed in the form: variable name = present value (i.e., A = 2). This is a great help in debugging programs. Putting STOP statements in the program and then checking the variables at that point is one way to find out where the program is amiss.

DUMP may fill the CRT and cause scrolling. This can be stopped by holding down the SHIFT key. Releasing the SHIFT will allow the scrolling to continue. The STOP will cause the scrolling to stop and abort, as in FIND.

HELP—When you encounter an error while running a program, the PET/CBM will stop the program and print an error message and line number. The HELP command will list the line and indicate the error within the line with a reverse field cursor. The syntax is: HELP.

HELP must be executed before anything else after an error message, otherwise the source of the error will be lost. In that case, executing HELP will do nothing and the computer will come back with READY.

The cursor is usually placed on the character just before the error, but in some cases will be on the error. In the case of 10 B = A / 0, the cursor would be on the 0 (division by 0 is an error).

TRACE—turns on a tracer mode, which will display the currently executed line number when the program is running. The last six line numbers are visible in a reverse field window printed in the upper right-hand corner of the CRT. These six lines scroll from bottom to top within the window, with the most recent line number at the bottom.

Pressing SHIFT will slow the program and scrolling down to about two lines per second.

STEP—also activates the tracer mode, executing one line of BASIC at a time. The line numbers and reverse field window appear just as in TRACE. To execute the next line, momentarily press SHIFT. If you hold the SHIFT key down, the program will continue to run until SHIFT is released. To stop, simply press STOP.

STEP can be conveniently used in debugging also. Being able to single step through a suspected problem area aids in locating the possible faulty coding.

OFF—turns off either the TRACE or

STEP commands.

Types of Toolkits

There are basically two types of Toolkits: a 2K ROM that plugs into an empty socket in the new PET/CBM (16K/32K) or an expansion board such as BETSI, and the ROM and an interface IC mounted on a small PC board that plugs into the memory expansion port on the 8K PET. This board has a single wire with a small connector that plugs into the second cassette port to supply 5 V dc for the board.

The costs of the two types are \$50 and \$80, respectively. The Toolkit comes with a money-back guarantee if you are not completely satisfied; there is also an exchange policy. If you purchase a Toolkit for a PET with the old ROM set and then decide to update to the new ROM set, you can exchange your Toolkit for one that will work with the new ROM set for \$15.

Conclusion

Palo Alto ICs and Nestar Systems are not mail-order houses. Do not try to order from them, as you will only delay in getting your Toolkit. You should order from your local computer store. The only mail-order firm that I have seen advertising the Toolkit is Skyles Electric Works, 10301 Stonydale Dr., Cupertino CA 95014. ■

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