

# HP-33E

## Quick Reference Card

### AUTOMATIC MEMORY STACK

T	0.0000
Z	0.0000
Y	0.0000
X	0.0000

Always displayed.

### PRIMARY STORAGE REGISTERS

R <sub>0</sub>		
R <sub>1</sub>		
R <sub>2</sub>		n
R <sub>3</sub>		$\Sigma x$
R <sub>4</sub>		$\Sigma x^2$
R <sub>5</sub>		$\Sigma y$
R <sub>6</sub>		$\Sigma y^2$
R <sub>7</sub>		$\Sigma xy$

**Statistical Registers**

**STO** n Stores x value in R<sub>n</sub>.

**RCL** n Recalls value from R<sub>n</sub>.

<b>STO</b> <b>-</b> n	x value subtracted from contents of $R_n$ and difference stored in $R_n$ .
<b>STO</b> <b>+</b> n	x value added to contents of $R_n$ and sum stored in $R_n$ .
<b>STO</b> <b>x</b> n	x value multiplied by contents of $R_n$ and product stored in $R_n$ .
<b>STO</b> <b>÷</b> n	Contents of $R_n$ divided by x value and quotient stored in $R_n$ .

## Programming the HP-33E

### PROGRAM MEMORY

When the calculator is switched ON, program memory is filled with **GTO** 00 instructions (keycode 13 00).

00		◀ Automatic stop instruction.
01-	13 00	
02-	13 00	
03-	13 00	
⋮	⋮	
46-	13 00	
47-	13 00	
48-	13 00	
49-	13 00	◀ 49 lines for your programs.

## PROGRAM MODE

PRGM  RUN

In program mode, only the following functions are active. All other functions are loaded into program memory when pressed.

**GTO** .nn sets calculator to line nn of program memory.

**SST** Single step. Steps calculator forward one line in program memory.

**BST** Back step. Steps calculator back one line in program memory.

**f** CLEAR **PRGM** Clear program. Clears program memory to all **GTO** 00 instructions, sets calculator to line 00.

**f** CLEAR **PREFIX** Clear prefix. After **f**, **g**, **STO**, **RCL**, **GTO**, or **GSB** cancels that key.

## RUN MODE

PRGM  RUN

**Pressed From the Keyboard:**

**GTO** .nn sets the calculator to line nn of program memory.

**GTO** followed by line number 00-49 causes calculator to go to designated line and stop there.

**GSB** followed by line number 01-49 causes calculator to go to the line designated and begin execution from that line.

**RTN** sets calculator to line 00 of program memory.

**R/S** begins execution from current line of program memory. Stops execution if program is running.

**f CLEAR PRGM** Clear program. Acts same as **RTN**. Does not clear program when in RUN mode.

Some functions that are active in PROGRAM mode operate differently in RUN mode:

**SST** Single step. Displays line number and keycode of current line of program memory when held down; executes current instruction, displays result, and moves to next line when released. Used for single-step execution of program.

**BST** Back step. Moves to previous line and displays line number and keycode of that previous line of program memory when **BST** is held down; displays original contents of X-register when released. No instructions are executed.

## Executed in a Program:

Function keys may be executed as instructions in a program. Some function keys that are most often used in or are unique to programming applications are shown below:

**PAUSE** Stops program execution for approximately 1 second, displays contents of X-register, then resumes program execution.

**X≠Y** **X=Y** **X>Y** **X≤Y** **X=0** **X>0** **X<0** **X≠0**

Conditionals. Each tests value in X-register against 0 or value in Y-register as indicated. If true, calculator executes instruction in next line of program memory. If false, calculator skips one line before resuming execution.

**RTN** Return. Halts program execution and returns control to the keyboard unless executed as a result of a **GSB** instruction. In this case, the calculator returns to the line after the **GSB** instruction and continues execution.

**Line 00.** If program control goes to line 00, either as a result of a **GTO** or by incrementing from line 49, calculator stops execution unless in a subroutine. In this case the calculator executes a **RTN** and continues execution at the line number after the **GSB**.

**R/S** Run/stop. Stops program execution.

**GTO** Go to. Followed by line numbers 00-49 causes calculator to go to designated line and begin execution there.

**GSB** Go to subroutine. Followed by line numbers 01-49 causes calculator to go to designated line and execute that section of program memory as a subroutine. Subroutines can be nested up to three levels deep.

