

Chapter 1

Keys

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Introduction

This chapter:

- illustrates the HP 49G keyboard
- describes the seven HP 49G keyboards
- briefly describes the purpose of each key.

Key map

The following is an illustration of the layout of the keys on the HP 49G. The keys are described in “What each key does” on page 1-5, where each key—with the exception of the arrow keys—is grouped according to the row in which it appears. The arrow keys are explained at the end of the chapter.

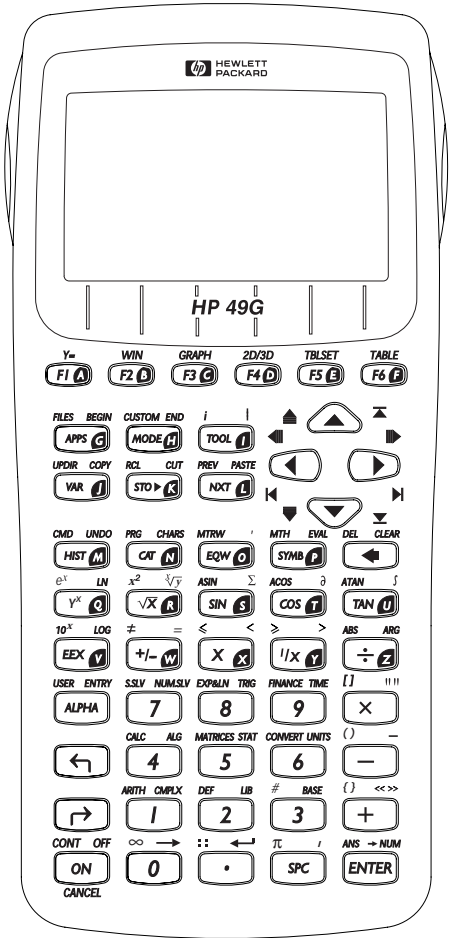


Figure 1.1: HP 49G key map

The HP 49G's keyboards

The HP 49G keyboard is seven keyboards in one. These are:

- **Primary keyboard:** comprises all the keys from the second row to the last row of the keypad (from (APPS) to (ENTER)) when pressed on their own. The function of the keys on the primary keyboard is indicated by the main label or symbol on the face of the key. For example, (MODE) indicates that the key, when pressed on its own, is used to view and change the calculator's modes.
- **Function keyboard:** comprises the six keys on the first row of the keypad—labelled (F1) to (F6)—when pressed on their own. Unlike the keys of the primary keyboard, the function of a key on the function keyboard is dependent on the context. For example, in some contexts (F1) enables you to edit an object; in other contexts, (F1) enables you to select a variable, submenu, or directory.
- **Left-shift keyboard:** comprises keys pressed in combination with the (⇧) key. The (⇧) key is pressed first followed by another key. The function performed by a particular left-shift key combination is indicated by the blue label above a key. For example, the label “FILES” appears in blue above the (APPS) key. This indicates that File Manager can be opened by pressing (⇧) and then the (APPS) key.

Note that in RPN mode, key combinations involving (⇧) and a function key require you to keep (⇧) pressed while pressing the function key.

In this guide, an instruction to use the left-shift keyboard is indicated by the left-shift symbol—(⇧)—followed by the *label* that indicates the function to be selected (such as (FILES)). Note that the label is *not* a key. (To continue the example, there is no (FILES) key. To invoke the Files function—that is, open File Manager—you press (⇧) and the key beneath the FILES label: (APPS).)

- **Right-shift keyboard:** comprises keys pressed in combination with the (⇨) key. The (⇨) key is pressed first followed by another key. The function performed by a particular right-shift key combination is indicated by the red label above a key. For example, the label “PASTE” appears in red above the (NXT) key. This indicates that you can invoke the Paste function by pressing (⇨) and the (NXT) key.

In this guide, an instruction to use the right-shift keyboard is indicated by the right-shift symbol—(⇨)—followed by the *label* that indicates the function to be selected (such as (PASTE)). Note that the label is *not* a key. (To continue the example, there is no (PASTE) key. To invoke the Paste function, you press (⇨) and the key beneath the PASTE label: (NXT).)

- **Alpha keyboard:** comprises the keys with the characters A to Z marked on their face. (These characters are colored white on a green background.) You need to activate the alpha keyboard before you can enter an alphabetic character. (Until you activate the alpha keyboard, these keys belong to the primary or function keyboard, as described above).

You activate the alpha keyboard by pressing [ALPHA] . For example, to enter T press [ALPHA] —thereby activating the alpha keyboard—and [COS] (since [COS] is the primary key that has T marked on it).

You can keep the alpha keyboard active by pressing [ALPHA] twice. Every character you subsequently enter is a character from the alpha keyboard. In this situation, you press [ALPHA] again to deactivate the alpha keyboard.

While the alpha keyboard is active, you can press the keys on the numeric keypad if you want to add a number to a text string.

The alpha keyboard is described in more detail in chapter 2, “Basic operation”.

- **Alpha left-shift keyboard:** comprises the keys of the alpha keyboard (see above) when pressed in combination with the [⇐] key. The [ALPHA] key is pressed first—to activate the alpha keyboard—followed by the [⇐] key (which activates the alpha left-shift keyboard). Finally, some other key is pressed to enter a character.

The characters you can enter using the alpha left-shift keyboard are lower-case alphabetic characters and various symbols. These are shown in blue above the keys in the illustration on the front cover of the pocket guide.

For example, to enter a lower-case t , press [ALPHA] [⇐] [COS] .

- **Alpha right-shift keyboard:** comprises the keys of the alpha keyboard (see above) when pressed in combination with the [⇒] key. The [ALPHA] key is pressed first—to activate the alpha keyboard—followed by the [⇒] key (which activates the alpha right-shift keyboard). Finally, some other key is pressed to enter a character.

The characters you can enter using the alpha right-shift keyboard are characters of the Greek alphabet, arrows, and various symbols. These are shown in red above the keys in the illustration on the front cover of the pocket guide.

For example, to enter σ , press [ALPHA] [⇒] [SIN] .

In addition to the seven keyboards discussed above, you can also create a customized keyboard. A customized keyboard—also known as the *user keyboard*—is one where alternative functionality is assigned to one or more keys. This is discussed in detail in *Advanced User's Guide*, found at <http://www.hp.com/calculators/hp49>.

What each key does

This section describes the function of each key and main key combinations. Note that the keys and key combinations are listed in the order that they appear on the keyboard (see keyboard map on page 1-2).

The syntax required for various functions is also given. This syntax assumes that you are working in algebraic mode, not RPN mode. (These modes are explained in chapter 2, “Basic operation”.)

Row 1

		Y=	WIN	GRAPH	2D/3D	TBLSET	TABLE
	List equations to plot or open Matrix Writer if you have chosen to plot statistical data.						
	Specify plot window parameters.						
	Draw specified plots.						
	Specify plotting parameters.						
	Customize a table of plotted points.						
	Draw a table of plotted points.						
–	Keys of the function keyboard (see previous section). The function of these keys varies according to context.						

Row 2

		FILES	BEGIN	CUSTOM	END	i	
	Open File Manager.						
	Mark the start of something you want to copy or cut.						
	Display your custom menu.						
	Mark the end of something you want to copy or cut.						
	Enter the symbolic constant i , the square root of -1 .						
	Enter a <i>where</i> function.						
	View a list of all the calculator's applications.						
	View and change the calculator's modes and flags.						
	Display a menu of commands relevant to the current application.						

The arrow keys are discussed at the end of this chapter.

Row 3



UPDIR

Select the next directory up the directory tree.

COPY

Copy a selection.

RCL

Recall the value of a specified variable.

CUT

Cut a selection.

PREV

Display the previous page of a multi-page function-key menu.

PASTE

Paste a selection that you have copied or cut.

VAR

Display the variables contained in the current directory.

STO►

Store the current object in a variable.

NXT

Display the next page of a multi-page function-key menu.

The arrow keys are discussed at the end of this chapter.

Row 4



CMD

Display a list of the last four commands or calculations.

UNDO

Restore history to what it was before the last operation.

PRG

Display the programming menu.

CHARS

Display all the characters that can be entered.

MTRW

Open Matrix Writer.

'

Enter tick marks, to delimit an algebraic object.

MTH

Display the mathematics menu.

EVAL

Evaluate an expression.

DEL

Delete the last object in history (or, in RPN mode, the entire stack).

CLEAR

Clear history.

HIST

Display, and access, all previous calculations and results.

CAT

Display a list of all the calculator's commands, including those that have been added in libraries.

EQW

Open Equation Writer.

SYMB

Display a menu of sub-menus, each listing the more commonly used symbolic commands.

◀

Delete the character to the left of the cursor.

Row 5

e^x

Calculate the natural antilog of a specified number. Syntax: $e^x x$

LN

Calculate the natural logarithm of a specified number. Syntax: LN x

x^2

Calculate the square of a specified number. Syntax: $x^2 x$

$x\sqrt{y}$

Calculate the x th root of y . Syntax: $x\sqrt{y} (x, y)$

ASIN

Calculate the arc sine of an angle. Syntax: ASIN x

Σ

Perform summation of numbers within specified limits. Syntax: $\Sigma(r=i, j, S)$ where r is the summation index, i is the initial value, j is the final value and S is the summand.

ACOS

Calculate the arc cosine of an angle. Syntax: ACOS x

∂

Enter the differentiation sign.

ATAN

Calculate the arc tangent of an angle. Syntax: ATAN x

\int

Enter the integration operator.

y^x

Calculate y to the power of x . Syntax: $y^x y x$

\sqrt{x}

Calculate the square root of x . Syntax: $\sqrt{x} x$

SIN

Calculate the sine of an angle. Syntax: SIN x

COS

Calculate the cosine of an angle. Syntax: COS x

TAN

Calculate the tangent of an angle. Syntax: TAN x



Row 6

10^x

Calculate the common (base 10) antilogarithm of a number. Syntax: $10^x x$

log

Calculate the common (base 10) logarithm of a number. Syntax: log x

\neq

Insert a not-equals sign.

=

Insert an equals sign.

\leq

Insert a less-than-or-equal-to sign.

<

Insert a less-than sign.

\geq

Insert a greater-than-or-equal-to sign.

>

Insert a greater-than sign.

ABS

Display the absolute value of a real or complex number. Syntax: ABS x



- (ARG)** Calculate the angle defined by a complex number. Syntax: **(ARG)**
 $a + bi$
- (EE \times)** Insert the exponent symbol and treat the entry in mantissa-and-exponent format.
- (+/-)** Change the sign of a number.
- (x)** Insert an x .
- ($\frac{1}{x}$)** Calculate the inverse of a number. Syntax: **($\frac{1}{x}$)** x
- (\div)** Perform division. Syntax: x **(\div)** y

Row 7






- (USER)** Activate the user keyboard. **USER** **ENTRY** **S.SLV** **NUM.SLV** **EXP&LN** **TRIG** **FINANCE** **TIME** **[]** **" "**
- (ENTRY)** Change entry mode. **ALPHA** **7** **8** **9** **\times**
- (S.SLV)** Display a list of commands used to solve equations symbolically.
- (NUM.SLV)** Display a menu of applications used to solve equations numerically.
- (EXP&LN)** Display a list of exponential and logarithm functions.
- (TRIG)** Display a list of trigonometry functions.
- (FINANCE)** Display an input form for performing financial calculations.
- (TIME)** Open the time application to set the time and alarms.
- []** Enter square brackets, for delimiting a vector or array.
- " "** Enter quote marks, for delimiting a string.
- (ALPHA)** Activate the alpha keyboard.
- 7** **9** Enter numbers.
- (\times)** Perform multiplication. Syntax: x **(\times)** y

Row 8






- (CALC)** Display a list of calculus functions. **←** **CALC** **ALG** **MATRICES** **STAT** **CONVERT** **UNITS** **()** **-**
- (ALG)** Display a list of algebra functions.
- (MATRICES)** Display a list of matrix functions.
- (STAT)** Display a list of statistics applications.
- (CONVERT)** Display a list of conversion functions.
- (UNITS)** Open the units application.
- ()** Enter parentheses, for enclosing parameters.
- _** Enter underscore, to create a unit object.
- ←** Select the left-shift keyboard or alpha left-shift keyboard.

- ④–⑥ Enter numbers.
 − Perform subtraction. Syntax: $x \ominus y$













Row 9

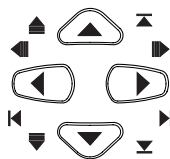
- (ARITH) Display a list of arithmetic functions.     
- (CMPLX) Display a list of functions relating to complex numbers.
- (DEF) Store an expression or define a user function.
- (LIB) List all libraries.
- (#) Enter a # symbol (to, for example, enter a binary integer)
- (BASE) Display a list of functions relating to binary arithmetic.
- ({} Enter braces, for delimiting a list.
- (<>) Enter angle brackets, to delimit programming code.
- (⇨) Select the right-shift or alpha right-shift keyboard.
- ①–③ Enter numbers.
- + Perform addition. Syntax: $x \oplus y$

Row 10

- (CONT) Continue a halted program or suspended application.     
- (OFF) Turn off the calculator.
- (∞) Enter the infinity symbol.
- (→) Enter a right-pointing arrow.
- (::) Tag an object.
- (←) Start a new line.
- (π) Enter pi.
- (,) Enter a comma.
- (ANS) Recall a previous answer.
- (→NUM) Display the result in approximate mode.
- (ON) Turn the calculator on.
- (0) Enter a zero.
- (•) Enter a decimal point.
- (SPC) Enter a space.
- (ENTER) Obtain a result or select an option.
- (CANCEL) Cancels an operation.

Arrow keys

-  Move up to the first object or field shown.
-  Move up to the previous object or field.
-  Move up to the first object or field.
-  Move to leftmost object or field shown.
-  Move to rightmost object or field shown.
-  Move left to the previous object or field.
-  Move right to the next object or field.
-  Move left to the first object or field.
-  Move right to the last object or field.
-  Move down to the last object or field shown.
-  Move down to the next object or field.
-  Move down to the last object or field.



Key conventions

In this guide, a key press is represented in one of three ways:

- A function key operation is indicated by small capitals. The text of the operation matches the text displayed on a function-key menu (that is, a menu displayed along the bottom of the screen).

For example, an instruction to press **EDIT** is an instruction to press whatever function key is directly below the word **EDIT** displayed at the bottom of the screen. (Function keys are the keys marked **F1** to **F6**.)

- An operation initiated by pressing a key or keys other than a single function key is indicated by one or more key characters. Some examples are **SIN**, **⇨** **WIN**, **▶**, and **MODE**.

Note that where a key character appears on its own, press the corresponding key; for example, **EQW**. Where a key character is preceded by **⇧** or **⇩**, the key character refers to a label printed above a key. After you press **⇧** or **⇩**, press the key below the label. For example, an instruction to press **⇧** **ABS** is an instruction to press **⇧** followed by **÷** since **ABS** is a label above the **÷** key.

- The key for a number or alphabetic character is indicated by the number or character: for example, **4**, **A**.