



## hp calculators

HP 50g Using a Secure Digital Card with ROM 2.08

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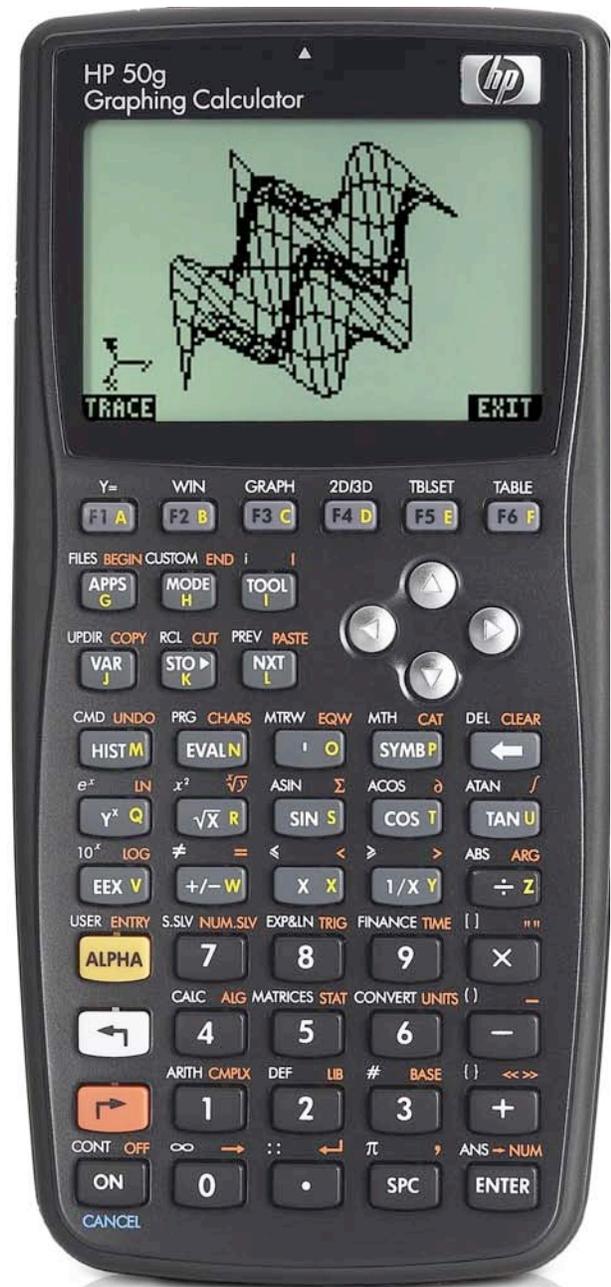
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## Introduction

One of the truly innovative features of the HP 50g calculator is the ability to use industry standard Secure Digital (SD) and Multimedia Memory Cards (MMC) memory expansion cards. This feature allows for an almost unlimited expansion of storage space for the HP 50g user. Objects can be stored to and recalled from SD cards. Objects can also be evaluated while stored in SD cards. Note that although the instructions in this training aid refer to SD cards, everything covered here works exactly the same with an MMC card. Also, throughout this training aid, RPN mode is assumed.

The information in this document applies specifically to ROM version 2.08 for the HP 50g calculator. HP 50g calculators using a different ROM version may not respond exactly as indicated in this document. To find out the ROM version of your calculator, type in  $\text{ALPHA}$   $\text{ALPHA}$   $\text{V}$   $\text{E}$   $\text{R}$   $\text{S}$   $\text{I}$   $\text{O}$   $\text{N}$  and press  $\text{ENTER}$ . The current ROM version number will be displayed. If you find that you have an ROM version earlier than 2.08 (which would be displayed as a smaller number), please go to the section of this document titled "Upgrading the HP 50g ROM using an SD Card" to find out how to update your flash ROM.

## Inserting and Removing an SD Card

The HP 50g SD slot is located at the bottom front edge of the calculator just below the digit keys. The SD card fits into this slot. Note that the card must be inserted facing down. Most cards have a brand label on what would usually be considered the top of the card. If you are holding the HP 50g with the keyboard facing up, then this side of the SD card should face "down" or away from you when being inserted into the HP 50g. If you are holding the HP 50g with the keyboard facing down, then the SD card should be inserted into the HP 50g with the labeled side of the SD card facing "up" or toward you. The card will go into the slot without resistance for 3/4 of its length and then it will require slightly more force to fully insert it. A fully inserted card is almost flush with the case, leaving only the top edge of the card visible. If the card does not go in with a little force, you probably have it incorrectly – do NOT use excessive force!

To remove an SD card, be sure the HP 50g is turned off. Then press gently against the exposed rim of the card and push in. The card should "spring" out of the card slot a small distance, allowing it to be removed from the calculator.

## Formatting an SD Card

Most SD cards will come formatted, but they may be preformatted with a file system that is incompatible with the HP 50g. The HP 50g will only work with cards formatted under the FAT16 format (the other common file system, used on larger cards, is FAT32). If you place a new SD card into the HP 50g and it is not recognized, it should probably be reformatted under FAT16. Several options exist to format an SD card. Keep in mind that when formatting an SD card, ALL DATA ON THE CARD WILL BE LOST.

**Method 1:** Use the HP 50g to format the SD card. This is certainly the easiest way to prepare a card for use with the HP 50g and guarantees that it will be formatted under FAT16.

However, formatting the card using the HP 50g should only be done with fresh, preferably non-rechargeable batteries, as this process is rather power-consuming. It is not recommended that this be done with batteries that have been used for a while.

To format an SD card using the HP 50g requires accessing a system menu by pressing the  $\text{ON}$  and  $\text{F4}$  keys. To make this work, be sure to press  $\text{ON}$  first and while continuing to hold down  $\text{ON}$ , press down the  $\text{F4}$  key. Then release the  $\text{F4}$  key first and then release the  $\text{ON}$  key. A menu is displayed with several choices.

Press the  $\text{9}$  key to choose the menu option for "9. Format" as shown in the display. This will begin the formatting process for the SD card.

If no SD card is inserted when you begin this process, the calculator will display the message "PLEASE INSERT CARD" at the top of the LCD, and "PRESS ENTER EXIT" at the bottom of the LCD. Insert the SD card into the slot as described above and press  $\text{ENTER}$ .



and the object previously on the stack will be stored onto the SD card in a variable named 'OBJNAME'. Note that the name used for objects on an SD card must follow the rules for DOS names (up to 8 letters long, with a 3 letter extension, no special characters), which are different than the rules for naming objects on the HP 50g itself. Storing an object with a longer name will result in the name being altered to a maximum of the DOS 8.3 format.

### Recalling objects from an SD Card

To recall an object from an SD card, place the name and path of the object to recall on the stack by pressing the following keys:

 ::

Note that this puts the "double colon" on the edit line with the cursor blinking between the colons. This is the way the HP 50g addresses items stored in its various ports. Port 3 is the SD card port. Now press the following:

This will place the name and path of the object to be purged on the stack.  
To purge the object, press:



and the object will be purged.

### Using directories (folders) on an SD Card

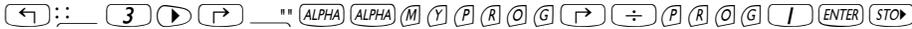
Because SD cards have such large capacities, it is often more useful to work with objects stored on them in directories (or folders). Directory names must be valid DOS names (up to 8 letters long, with a 3 letter extension, no special characters). SD card directories can themselves hold subdirectories.

### Storing an object into a directory on an SD card

Create the following object:



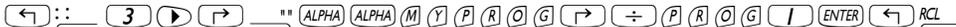
This object is a program that, when evaluated, will take an object on the stack and add 1 to it (where such an operation is a valid operation). Let's store the object using the name PROG1 onto the SD card into a directory called "MYPROG". Note that in the instructions below, a difference exists in how the name is specified when it contains a directory path. To store an object on the "root" level of an SD card, the  $\leftarrow$  key is used. When storing an object into a subdirectory, the name containing the directory path is specified using the  $\leftarrow$  \_" keys. Failing to make this distinction will result in an error when trying the example. With this object still on the first level of the stack, press:



This will store the object previously on the stack onto the SD card into the directory named MYPROG into an object named PROG1. Note: If the directory MYPROG does not already exist, these steps will create the directory.

### Recalling an object from a directory on an SD card

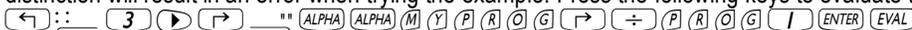
Let's recall an object with the name PROG1 from the SD card stored inside the directory named "MYPROG". Note that in the instructions below, a difference exists in how the name is specified when it contains a directory path. To recall an object on the "root" level of an SD card, the  $\leftarrow$  key is used. When recalling an object from a subdirectory, the name containing the directory path is specified using the  $\leftarrow$  \_" keys. Failing to make this distinction will result in an error when trying the example. Press the following keys to recall the object:



This will recall to the stack the object PROG1 in the directory named MYPROG in the SD card. Note: If the HP 50g does not have enough free memory to recall an object, an error message will be displayed. Delete some objects from the HP 50g's main memory and try again.

### Evaluating an object in a directory on an SD card

Let's evaluate an object with the name PROG1 from the SD card stored inside the directory named "MYPROG". Note that in the instructions below, a difference exists in how the name is specified when it contains a directory path. To evaluate an object on the "root" level of an SD card, the  $\leftarrow$  key is used. When evaluating an object in a subdirectory, the name containing the directory path is specified using the  $\leftarrow$  \_" keys. Failing to make this distinction will result in an error when trying the example. Press the following keys to evaluate the object:



This will evaluate the object PROG1 from the SD card in the directory named MYPROG. It will add a 1 to the object previously in the stack.

Note: It is easy to create an object that shows up on the VAR menu that will evaluate an object stored on the SD card. To create an object named "EVALOBJ" that will appear in the VAR menu and that will evaluate the PROG1 object stored in the MYPROG subdirectory on the SD CARD, press the following:

This will create an object that appears on the HP 50g VAR menu that will evaluate the object PROG1 in the subdirectory MYPROG on the SD card. Try it by pressing [7] [0] and you'll see 71 displayed.

This is a VERY useful way of extending the built-in memory space of the HP 50g when this is done with larger objects (particularly with executable program objects).

### Purging an object in a directory on an SD card

Let's purge an object with the name PROG1 from the SD card stored inside the directory named "MYPROG". Note that in the instructions below, a difference exists in how the name is specified when it contains a directory path. To purge an object on the "root" level of an SD card, the key is used. When purging an object in a subdirectory, the name containing the directory path is specified using the keys. Failing to make this distinction will result in an error when trying the example. Press the following keys to specify the object to be purged from the SD card:

This will place the name and path of the object to be purged on the stack.

To purge the object, press:

and the object will be purged.

### Upgrading the HP 50g ROM using an SD Card

SD cards can be used also for installing a Flash ROM upgrade in your HP 50g calculator. To use a SD card for the upgrade, first, follow the instructions mentioned above to be sure that your SD card has the right format. Then, you must have the SD card inserted into a desktop computer with an SD card reader/writer or a laptop with an SD card slot or a PC Card / SD adapter. Finally, you should make sure you have downloaded the latest version of the Flash ROM. The most recent ROM release can be found at this URL: <http://www.hp.com/calculators/graphing/49gplus/> by selecting the **Update software and drivers** section on that web page. Note: This is also the location where any updates to the connectivity kit can be found. Then do the following steps:

- 1) On your PC run the file you downloaded (double-clicking the file will work fine). It will unpack the files needed for the upgrade into the selected directory (it should be the same directory where the Connectivity Kit software has been installed).
- 2) Copy these two files: **hp49g22.bin** (this is the name for the ROM 2.08 file – future ROM updates will have a slightly different name, but will have a file extension of .bin – this would be the file to copy) and **update.scp** that should be located in the C:\Program Files\hewlett-packard\conn4x directory (or the directory where the Connectivity Kit software has been installed) to an SD card formatted using the FAT 16 format. There may be a "readme" file present, but do not copy it to the SD card.
- 3) On the calculator, press and hold the and keys and press the RESET button using a paper clip or other blunt object. The RESET button is found on the back of the calculator, near the Serial Number about 5 cm from the bottom. It is a small hole.
- 4) Release the RESET button, wait 2 seconds and release the and keys. Your calculator screen should display the update and self-test menu.

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- 5) Insert the SD card (upside down as previously described) with the ROM update files on it into the calculator.
- 6) Press **[F]** to choose the menu item **UPDATE CODE**.
- 7) Press **[2]** to choose the menu item **Update from SD CARD**.
- 8) The calculator should start updating the ROM (you will see flashing messages telling you about the update process). This should take around 1 minute.
- 9) When the upgrade is finished (the calculator displays: UPDATE FINISH, WAIT RESET), press the RESET button again using a paper clip or other blunt object. Your calculator's ROM has now been upgraded.
- 10) To check if the upgrade was applied successfully, execute the VERSION command by typing **[ALPHA] [ALPHA] [V] [E] [R] [S] [I] [O] [N] [ENTER]**. It should display the version number of the Flash ROM you just uploaded.

### Frequently Asked Questions about SD Cards and the HP 50g

This section of the document will provide answers to some frequently asked questions about SD cards and the HP 50g.

Question: What is the maximum size SD card supported?

Answer: There really is no maximum size. This is limited by the size of cards available. Cards of 512MB capacities have been tested and found to work, PROVIDED they are formatted under the FAT16 format. Note: If a card does not work, the first thing to do is check how the card is formatted. As SD cards become larger, it may become increasingly likely that SD card manufacturers will preformat their cards using FAT32 as the original file system. These cards will not work in the HP 50g until they are reformatted.

Question: Can I store and use libraries on SD cards?

Answer: Under ROM version 2.08, library objects can be stored on SD cards, but cannot be used or evaluated while on SD cards. The SD card makes a good place to store libraries which can be recalled and attached to the calculator when needed, but they cannot be "run" from the SD card.

Question: Can I use an MMC card rather than an SD card?

Answer: Yes, MMC cards will work the same way an SD card does.

Question: Can I format an SD card on my computer if it is not running Windows?

Answer: That depends. All that the HP 50g requires is that the card be formatted with a FAT16 format. If there are utilities running on other computer operating systems that can do this, it should work. However, it is probably easier to just format the card using the HP 50g.

Question: Can I copy files to my SD card on my computer if it is not running Windows?

Answer: That depends. If you can "mount" the SD card onto the other computer's desktop, you should be able to copy files to the subdirectories/folders on the SD card and be able to use them on the HP 50g. However, it is probably best to create these subdirectories/folders on the SD card from within the HP 50g first, rather than from the non-Windows computer. This will make sure that the subdirectory names are valid DOS names.