

CHDK

Installation Guide

Supplement to User Quick Start Guide



CHDK

Canon® Hack Development Kit

Installation Guide © 2010

Contents

Introduction.....	2
Finding the firmware version.....	3
Camera Version app.	3
VER.REQ	4
Downloading CHDK Files	5
Installing CHDK to SD card	6
Cardtricks app.	7
SDMinst app.	8
Description of SDMinst	8
Manually load CHDK	10
Extra Information	11
Troubleshooting	12
Credits	13

Introduction

Welcome to the CHDK installation guide.

You now have your new Canon[®] camera, and you have found CHDK either from an internet search, or maybe a friend has told you about it, in any case you like the idea of using all the extra features locked up in the camera, so you have been to the Wiki pages and you have decided to download and add CHDK to your SD card. The following articles have been written by many different contributors, on the Wiki pages, at the Forum, and elsewhere, to help you do just that, many thanks go to all of them.

CHDK exists because of the developers who produce it, we are sincerely grateful for their hard work and sharing.

It is suggested to print and read all of this document before commencing to install.

Firstly, we should look at a few important facts.

- **CHDK only works with Canon** point-and-shoot digital cameras. CHDK does not work with cameras from other manufacturers, nor with Canon's digital SLR range.
- **A different version of CHDK** is needed for each Canon camera model. The CHDK version for the Canon G9 camera does not work with the Canon SX200 IS camera. Volunteer programmers (developers) adapt CHDK for a particular Canon camera version. The adaption takes some time, so CHDK will not be immediately available for each new Canon camera model as they are introduced, in fact, if there is not a developer who has access to a particular model, and wants to invest the time and effort, then it may never be “ported” (that is, CHDK not developed for that model)
- **A different version of CHDK** is needed for different firmware versions of a camera model, (example - the G11 has known versions 1.00f, 1.00h, 1.00j, 1.00k, 1.00l)
- **Disclaimer** – CHDK is experimental ! CHDK comes without warranty for any use; **you use it at your own risk**. Also - by using this document you are reading you accept any risk in doing so.

For details see the online CHDK User Manual:

http://chdk.wikia.com/wiki/CHDK_User_Manual

To keep the size of this supplement reasonably small and to avoid confusion, all the methods of installing CHDK are not provided here, instead, the two easiest methods are shown, one for Windows OS users, and one for Mac OS users, both using helper applications.

We will also briefly describe the manual way, without using a helper application. Other descriptions of methods are available at the CHDK Wiki. –

<http://chdk.wikia.com/wiki/CHDK>

As this may be your beginnings with CHDK, we will not be too technical in the descriptions in this supplement, but it is assumed you have reasonable computer abilities.

Modern digital cameras such as the Powershot® range contain tiny computers and software (firmware) to run them. The firmware is needed to instruct the computer how to drive the various functions of the camera. Each camera's firmware is identified by a version number, such as 1.00B, or 1.01A. CHDK is an extension that uses the firmware that comes with the camera, and is developed for each firmware version, so CHDK for a firmware version 1.00 C should not be installed on a camera running firmware version 1.00 D.

Finding the Firmware version.

There are a couple of methods to determine the firmware version of the camera, firstly there is the small Windows application Camera Version released in January 2010 from forum member *whim*.

Secondly, by adding a plain .txt file named ver.req, to the SD card and pressing camera buttons. We'll describe the CameraVersion app. first.

CameraVersion is a small Windows tool that helps to get the 'real' firmware version of a Canon Powershot camera. Based on Phil Harvey's [ExifTool](#), it shows the firmware version based on the EXIF data from a Canon JPG image.

Download the app. from here:–

<http://drop.io/chdkshellbeta/asset/cameraversion11-sfx-exe>

The file is a self-extracting archive, it contains CameraVersion.exe (the executable file)
OS requirements: MS Windows OS (2000 / XP / Vista / 2003 / 2008 / Seven)

You will need to shoot a jpeg image and have it saved on the SD card. Have the card inserted into a card reader connected to a PC. Start the tool (CameraVersion.exe), select your JPG image either with the "Browse JPEG" button or with drag & drop...



Screen shot of CameraVersion app.

The camera checked here is an IXUS 860 with a firmware version of 1.00C.

CHDK Forum link for CameraVersion:–

<http://chdk.setepontos.com/index.php/topic,4743.msg46149.html#msg46149>



Now we will look at the **VER.REQ** method of determining the camera's firmware version number. This will require a little more input. First connect the card reader to the computer, then insert the SD card you will be using. For Windows users start the "Notepad" application, for Macintosh users start "TextEdit", we want to create a plain text file so select that format, Linux users - use a similar application. We use these simple applications rather than one like "Word" because we don't want any hidden files or characters on the card that might cause complications.

Now, we don't need any content in this file, we just need to save it to the root directory of the SD card, named as **ver.req**, (that's a que on the end not a gee). The root directory is the window you see on the computer when you open an empty card. If your SD card has the drive letter "K", then the root directory is "K:\". When using a Mac it's what you see when you double click the SD card icon on your desktop and a window opens.

Yet another way to create the file in Windows is to open the SD card in My Computer, right click inside the window and select New... and then Text Document. An empty text document will be created and you can rename it to "ver.req" (be sure to have windows display the file-extension, otherwise it will become "ver.req.txt"). For Mac users change plain text encoding from Western (Mac OS Roman) to Unicode (UTF-16), and uncheck "if no extension is provided, use .txt" (if you don't see these options then you need to select "Make Plain Text" from the Format menu). Then click on Save. Once that empty file is saved on the card you can now remove the card and insert it into the camera.

It has been found that some cameras also support using a "**vers.req**" file in the same way. Note that it is called "**vers.req**" and not just "ver.req". That extra S in the filename allows you to even see the total number of shots that have been taken with your camera with the same keys pressed multiple times.

OK, now to pressing keys to get the version number...but...before we go on, it is advisable to visit the CHDK Wiki and check your camera model for any CHDK specific differences such as button modes and uses.

Most cameras until now use **FUNC.SET+ DISP** to determine the version number, but very recent models can vary from those, for example: SD780IS / IXUS100IS uses **FUNC.SET+ DOWN** (or **TRASH/TIMER** for **DOWN** ) and D10 similar, **FUNC.SET+ DOWN** , so just make sure which buttons to press for your camera. Write any CHDK specific differences down for reference.

Back to retrieving the version number - Switch on the camera in playback mode and wait for the main screen (don't switch on in record mode and change to playback later), press the **FUNC.SET+ DISP** buttons together (press **FUNC.SET** first, hold it down, then press **DISP**). You will see a string like **Firmware Ver GM1.00E**. The **1.00E** part is the firmware version.

Please note! your camera's firmware version is NOT **1.0.0.0** or **1.0.1.0** ! - It's a number that looks similar to this example: **GM1.01C**. If you get a number like 1.0.1.0, then something went wrong -
(See the Troubleshooting section on page 12)

In cameras that support vers.req, ver.req may no longer work, and all you'll get when you press **FUNC.SET+DISP** will be the time clock. If this happens, you need to create "vers.req" instead of "ver.req" on your SD card (or create both to be sure). Then pressing **FUNC.SET+ DISP** will get you the version information instead of the time clock.

Good ! - now that you have the correct firmware version number you are ready to download the CHDK files for your camera.

Downloading the CHDK files for your camera version.

The next step is to go to the Autobuild Server and download the files specific to your camera.

<http://mighty-hoernsche.de/>

CHDK-SVN Autobuild Download



Generated at Sun Apr 04 17:35:47 GMT 2010, build 0.9.9, revision 885
Please do not link directly to zip files. Link to this page instead.

Q: What is CHDK / an "Autobuild"?

A: CHDK is a firmware extension for Canon Powershot / Digital IXUS cameras. It enables a broad spectrum of features, such as:

- Shooting in RAW / DNG (Fast SD card is beneficial)
- Live histogram
- Zebra mode
- Shutter speeds from 1/40.000 to 64 seconds
- Scripting interface (uBasic & LUA)
- Games (sokoban & reversi)
- Bracketing
- Timelapse Videos over weeks or months with external power supplies & eye-fi wireless sd cards
- Motion detection with response times of just 60ms or less

An "Autobuild" version is a version of CHDK that is *still under development*. As the developers compile new versions to test, their efforts are "automatically built" and made available on the web for beta testing. As with most beta software, not all new features have been fully tested. Some features *may* not work with all camera models. Your feedback and bug-reports concerning these new builds are welcome on the CHDK forum or Bugtracker. Newcomers may find it more comfortable to not use an Autobuild, unless it is necessary to run CHDK on your camera. Although CHDK does not make any changes to the actual firmware on your camera, it may be possible to cause mechanical damage to your camera, but this is extremely unlikely due to the safeguards put in place by Canon - most people prefer not to work with software that hasn't been thoroughly debugged. For further information on CHDK, see [here](#)

Complete zips contain additional files like scripts, grids, language files, RBF fonts and curves

Small zips contain the bare DISKBOOT.bin and PS.FIR/PS.FI2

Camera	FW	Complete	Small
PowerShot A2000	1.00C	a2000-100c-0.9.9-885-full_BETA.zip (667KB)	a2000-100c-0.9.9-885_BETA.zip (346KB)
PowerShot A450	1.00D	a450-100d-0.9.9-885-full.zip (722KB)	a450-100d-0.9.9-885.zip (401KB)
PowerShot A460	1.00D	a460-100d-0.9.9-885-full.zip (723KB)	a460-100d-0.9.9-885.zip (402KB)
PowerShot A470	1.00E	a470-100e-0.9.9-885-full.zip (685KB)	a470-100e-0.9.9-885.zip (364KB)
	1.01A	a470-101a-0.9.9-885-full.zip (684KB)	a470-101a-0.9.9-885.zip (364KB)
	1.01B	a470-101b-0.9.9-885-full.zip (684KB)	a470-101b-0.9.9-885.zip (364KB)
	1.02C	a470-102c-0.9.9-885-full.zip (684KB)	a470-102c-0.9.9-885.zip (364KB)
PowerShot A480	1.00B	a480-100b-0.9.9-885-full.zip (672KB)	a480-100b-0.9.9-885.zip (352KB)
PowerShot A530	1.00A	a530-100a-0.9.9-885-full.zip (728KB)	a530-100a-0.9.9-885.zip (407KB)
PowerShot A540	1.00B	a540-100b-0.9.9-885-full.zip (729KB)	a540-100b-0.9.9-885.zip (408KB)
PowerShot A550	1.00C	a550-100c-0.9.9-885-full.zip (729KB)	a550-100c-0.9.9-885.zip (408KB)
PowerShot A560	1.00A	a560-100a-0.9.9-885-full.zip (727KB)	a560-100a-0.9.9-885.zip (406KB)

Let's say for example your camera is a G11 with firmware number 1.00F, then scroll down the page to the G11 section,

PowerShot G11	1.00F	g11-100f-0.9.9-885-full_BETA.zip (667KB)	g11-100f-0.9.9-885_BETA.zip (346KB)
	1.00J	g11-100j-0.9.9-885-full_BETA.zip (667KB)	g11-100j-0.9.9-885_BETA.zip (347KB)
	1.00K	g11-100k-0.9.9-885-full_BETA.zip (667KB)	g11-100k-0.9.9-885_BETA.zip (347KB)
	1.00L	g11-100l-0.9.9-885-full_BETA.zip (667KB)	g11-100l-0.9.9-885_BETA.zip (347KB)

Because this is your first installation, select the PowerShot G11 1.00F file in the “Complete” column, this will contain the boot files, and CHDK folders “Books”, “Curves”, “Scripts” and others.

Of course, your camera may not be a G11, so select the file for your camera from the list.

Later, when the time comes to upgrade to a later build, it will usually be only necessary to download the “Small” file, which contains only the boot files.

If all has gone well you should have a zip file with a folder containing these files:– **changelog.txt**, **CHDK folder**, **DISKBOOT.BIN**, **PS.FI2**, **readme.txt**, and **vers.req**. wherever you downloaded it to on your computer.

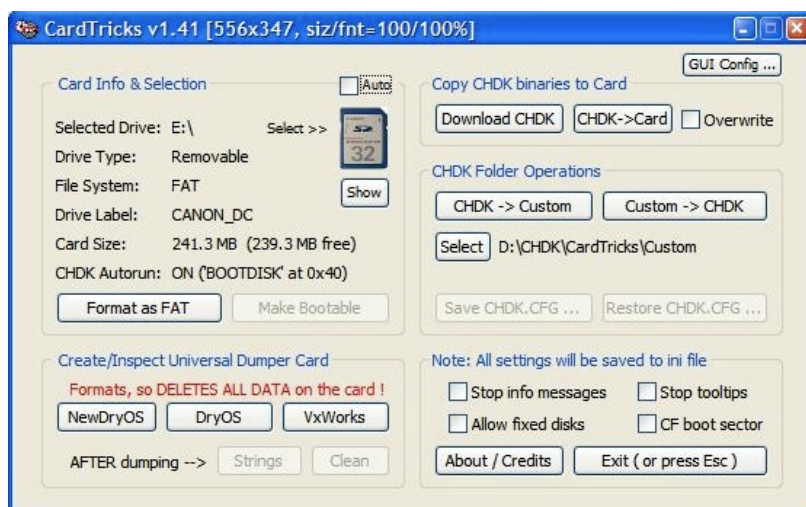
installing CHDK to an SD card

Before installing there are a few things to know about CHDK and SD cards, CHDK makes use of the one facility your camera does provide for loading software...the firmware update process. (Note that with CHDK this does not actually modify your firmware, It just loads from the SD card once at each startup, and unloads at shutdown). For CHDK to autoload at startup the DISKBOOT.BIN file must be in a FAT12 or FAT16 partition on a bootable SD card, for a card 2GB or less this can be just one partition. For SD cards 4GB or more, then 2 partitions are required, one for the DISKBOOT.BIN file and the other for the CHDK folder. For manual loading the SD card can remain as FAT32, with one partition containing all files.

Before starting the installation it is advisable to make sure the battery power is fully charged or connected to a/c power.

To install using MS Windows, download and install the application (program) **Cardtricks**, available here:–

<http://chdk.setepontos.com/index.php/topic,964.0.html>



Screenshot of
Cardtricks Installer for
CHDK with Windows OS

Remove the SD card from your camera and put it in a card reader connected to your PC. Open the application and select the CARD's ID Letter, when prompted. (pay attention: does the drive correspond to the SD memory card!)

Click the **Format as FAT** button, read and accept the notice.

Click the **Make Bootable** button, read and accept the notice.

Click the **CHDK ->Card** button and point to the ZIP file you downloaded for your camera. Cardtricks has formatted the SD card and made it bootable. Remove the card from the card reader.

Lock the card! (with the sliding tab on the side of the SD card) (images will still be saved to the locked card)

Place the locked card back in the camera and turn on. If everything went right the CHDK splash screen will be displayed for approx. 2 seconds. You can enter CHDK with a short press of the ALT (print) button and then pressing the menu button to access the CHDK menus.

There is a very helpful Wiki page with a fully illustrated description of using Cardtricks at:– http://chdk.wikia.com/wiki/CHDK/Installing_with_Cardtricks

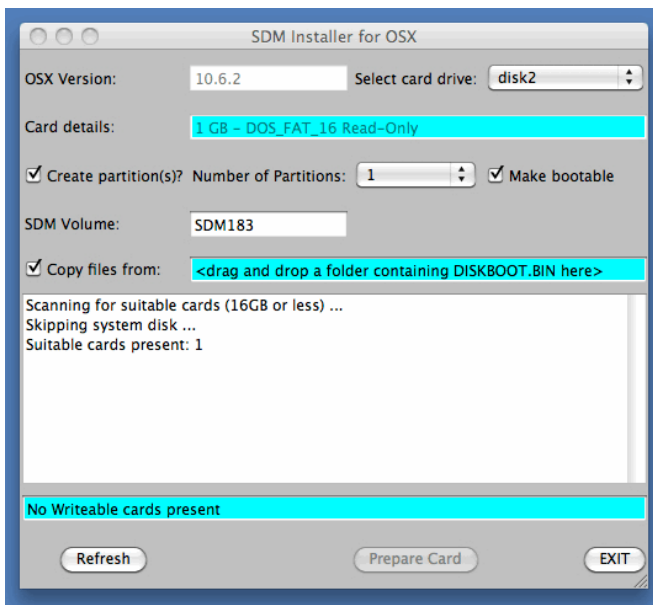
To install using Mac OS X, download and install the application **SDMInst**, available here:– <http://www.zenoshrdlu.com/clickpansdm/SDMInstaller.dmg> (direct download) at <http://www.zenoshrdlu.com/clickpansdm/sdminst.html>

Unzipping Files:

The Mac OS is playing safe, (as a security feature), by quarantining files that have been obtained from internet sites, CHDK &/or the camera won't understand that, To have control over that you can use a different default file expander to unzip globally, (Mac Unarchiver is the OS default, and can be changed) or you can use another, such as Stuffit Expander on an individual basis by using (right / control click) "Open with" ...

So open the ZIP file with Stuffit Expander to have a clean file to begin with.

Start **SDMInst**, drag and drop the unzipped CHDK folder onto the application window and make the appropriate selections according to the card size etc.



Screenshot of
SDMInst Installer for
CHDK with Mac OS X

Description of settings in SDMInst application (more next page)

Select card drive:	This is a drop-down list of available cards. Only those that are 16GB in size or less are shown.
Card details:	This shows the size and current format of the selected card
Create partition(s)? :	If this checkbox is ticked, SDMInst will try to partition and format the card. <i>Any existing data will be erased!</i>

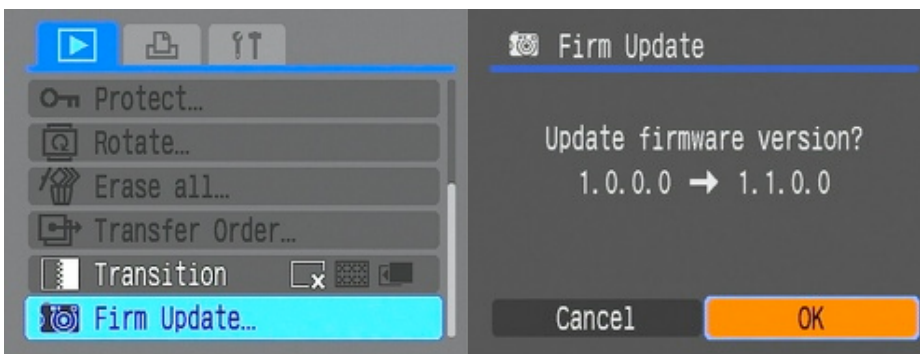
Number of partitions:	This determines whether 1 or 2 partitions will be created. Currently SDMinst does not give you a choice here. If the card is 2GB or less a single partition will be created. If it is larger then two partitions will be created - a small 16MB one containing DISKBOOT.BIN and the other will hold the SDM folders (SCRIPTS etc), photos and movies.
Make bootable:	If this is ticked, SDMinst will make the card bootable. This is highly recommended! Note that only a FAT16 partition can be made bootable. If the current format is not FAT16 and Create Partitions is not checked then SDMinst will refuse to make the card bootable.
Debug on:	If this is ticked, SDMinst will write debug messages to the log. This will help diagnose bugs and fix problems!
SDM Volume:	This is the 'volume name' of the first partition on the card. If "Create partitions" is ticked, then whatever you type here will be the new volume name. If only one partition is to be created this will hold DISKBOOT.BIN and the CHDK folders as well as photos and movies. If two partitions are to be created, this will be a small 16MB bootable partition used merely to hold DISKBOOT.BIN
Main Volume:	If "Create partitions" is ticked and two partitions are to be created, this will be the name of the second, main partition on the card. It will hold the CHDK folders as well as photos and movies (i.e. everything except DISKBOOT.BIN). If only one partition is to be created this field will not appear.
Copy all files from:	This menu gives you a choice to select no files, just DISKBOOT.BIN or all the files in the selected folder and have them copied onto the card.
Browse:	As an alternative to drag and drop, clicking this button will bring up a browser window which you can use to select the folder to be used for copying from.
Main window:	This area contains a log of what SDMinst has done.
Refresh:	Clicking this button will make SDMinst rescan for cards (for example after you changed cards).
Eject Card:	Clicking this button will eject the selected card. It will be grayed out if no cards are present.
Prepare card:	Clicking this button will make SDMinst create partition(s), make the card bootable and copy DISKBOOT.BIN (depending on what checkboxes are ticked). The button will be grayed out if SDMinst cannot do what is specified - the message area will indicate why (for example, because there are no suitable cards or the card has been locked).
EXIT:	Clicking this button will terminate SDMinst.

Manually load CHDK

So far we have described the methods of installing CHDK to auto start when switching a camera on, this was done by making the SD card bootable and loading the files with the help of an application (or program). Another way to have CHDK start is by the manual start (or manual load) way. We can achieve this by manually copying the required files to the SD card and then using the “Firm update” method to start CHDK.

It is usually best to start with a fresh SD card, to do this place the card in your camera and format it using the Canon menu, remembering to first back up anything on the card. Remove the formatted SD Card from the camera and place it in a card reader connected to your computer and open it to your desktop. Now locate the *unzipped* folder you downloaded for your camera (Mac users may want to read again the note describing unzipping on page 8), and drag and drop or copy and paste those files to the SD card. It is important for the manual loading process that the file PS.FIR or PS.FI2 is on the SD card. Remove the SD card and put it in the camera, *unlocked* in this case, not locked as when auto loading.

1. Switch the camera on in **Play mode**, not Record mode,
2. Press the MENU button, then press UP once (or scroll down the menu list)
3. An option to update the firmware appears, Select that option. (press FUNC.SET)
4. Confirm the update, (OK-press FUNC.SET)



The display will not show the firmware version of your camera, it will show like in this image. As described earlier at “Installing CHDK to an SD card” on page 6, this procedure will not modify the camera’s firmware.

Note: There are cameras that do not yet have Firm update support, (the G11 is one), if you cannot see the Firm update menu option go to the CHDK Forum and check the threads relating to your camera version. If yours does not have support it will need the Auto start bootable SD card. When you press OK to confirm the “update” the camera restarts, the blue led in the print button will flash, and the CHDK splash screen will show for about 2 seconds indicating that CHDK has loaded. On the LCD the icons for the battery and SD memory space should be showing because they are enabled by default.

If all of this has happened, – Well Done! – you can now use the hidden features of the camera and modify many of the standard features, just press the PRINT button with a momentary short press, and then the MENU button to access the <ALT> menu.

It is now time to have a rest, ...or... if you are ready to learn more straight away, start reading the CHDK Quick Start User Guide, the many pages at the CHDK Wiki, and don't forget the CHDK Forum.

Extra Information

For those who want to know how CHDK works, go to the Forum and read this thread:–

“How does CHDK start running”

<http://chdk.setepontos.com/index.php/topic,1454.msg13226.html#msg13226>

To find out more about “**Cardtricks**” go to the Wiki and see:–

http://chdk.wikia.com/wiki/CHDK/Installing_with_Cardtricks (Illustrated instructions at Wiki)

CHDK is constantly being changed and improved, to update to a later CHDK version, just copy the new PS.FIR and DISKBOOT.BIN files onto the SD card to overwrite the old ones. You do not have to delete any other file.

After running CHDK and setting all your options for histograms, zebra-mode, OSD (on-screen display) layout, fonts, colors, last script loaded, etc. all your settings are saved in the /CHDK/CHDK.CFG file. It even saves the last position you were reading in the last text-file you were viewing using the Text File-Reader. If you want to recreate those exact same settings on another SD card with CHDK on it, just copy that file from one SD card to another, making sure it's in the /CHDK/ folder on the new SD card.

Troubleshooting

If the camera “freezes” or is switched off during the updating process and / or does not respond to the power button, then this usually means that this CHDK version is not compatible with your camera. If that happens, Just open up the battery compartment and remove the batteries to turn the camera off, place them back in and everything should be fine. Check again the version number of the downloaded files with the version number of your camera.

For Mac users sometimes hidden leftover Mac bits on a file can cause readability problems such as the "Firm update" menu option not visible, without a hint to what is happening, so it is highly advisable to clean removable media such as SD cards with a suitable application, “AppleOff”, and “Blue Harvest” are just two of a number of cleaning applications. If problems persist see the section on the Wiki FAQ Mac page called “Still Having Trouble?”, it can be a little technical but if followed closely it may solve your problems.

If you see this type of version number **1.0.0.0** or **1.0.1.0** - then something went wrong, It should be a number that looks similar to this example: **GM1.01C** - you will have to go back over the steps carefully, A common problem is the name of the VERS.REQ file having .TXT at the end, so check and rename if required.

If the "Firm update" option did not appear in the menu, Remember - camera must be in Play mode before you start it. Some cameras you can press the [>] button to switch on in Play mode.

For the G11 CHDK does not yet support the manual loading method through the Firmware update mechanism, start the G11 from a CHDK-bootable SD card.

To check if CHDK might be causing any erratic behavior of the camera, take the SD card out and unlock it, (that is if it has been made bootable) put it back in the camera and test again, with the card unlocked CHDK has no effect, so the camera is back to using it's native firmware.

For a manual start SD card, to check if CHDK might be causing any erratic behavior of the camera, just use the card without starting CHDK, or you can try another SD card without CHDK on it.

SD cards do not normally contain multiple partitions. Some operating systems, particularly Windows, do not have drivers which can properly handle SD cards with multiple partitions. Windows will only see the first partition on an SD card. Because of this, the partitions need to be "swapped" before using a card in Windows if one wishes to transfer images directly. The CHDK debug menu has an option which will do this. When moving the card back to the camera, you will have to manually start CHDK (because the camera will only see the FAT32 partition, so it won't boot), and do a swap again.- (see pages 43, 45, 46 of the Quick Start User Guide)

It should also be noted that doing a card format in the camera will format the entire card into one volume, removing CHDK and other files in the process.

Credits

Camera Version is an application from CHDK Forum member *whim*

Cardtricks is also an application from CHDK Forum member *whim*

SDMInst is an application from CHDK Forum member *zeno* with some inspiration from Wiki member *Cowboytronic*

ExifTool is from Phil Harvey

Canon and Powershot are registered trade marks of Canon Inc.

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The information on these pages has been gathered from the CHDK Wiki, Forum, and elsewhere, thanks to all the authors, and the developers.

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Notes



Notes

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