

CHDK firmware usage

From CHDK Wiki

Contents



HDK firmware splash screen

You see something like this for a second or so as CHDK is booted off the card into the camera (unless you have disabled the splash screen)

<ALT> mode

<ALT> mode will disable your normal camera buttons and will give them an *alternative* meaning. This mode is normally **off**! You only need it for the main configuration menu, starting a script and other shortcuts.

How to activate <ALT> mode:

- **A-series:** press the direct print button
- **S2 & S3 IS:** press the <ALT> mode button as selected in Miscellaneous Stuff. In the Miscellaneous menu you may select from any of the following buttons to enter <ALT> mode: Shortcut*, Flash, Timer, ISO, or Video. To enter <ALT> mode press your chosen button for a short moment. To use the button's original function, press and hold the button slightly longer. (Note: this was done to prevent the original <ALT> mode Shortcut button from always interfering with your camera's Shortcut option. Making this adaptable to anyone's preferred method.)

* *Default button*

Main menu



To show the main menu press **Menu** button in <ALT> mode. To go back to the previous menu from a submenu you can use **Display** button.

Settings you have changed will be autosaved when you leave the main menu. They will not be saved when you just power off the cam without leaving the main menu before.

RAW parameters menu

Save RAW

Save RAW-files while shooting.

This option is also adjustable through <ALT> + **+/-** shortcut. (For the Powershot S-series, use <ALT> + **FUNC** (function button) to toggle the saving of RAW files on and off. See here.) The G7 requires <ALT> + the AF Frame Selector/Trash Can button.

When a RAW file is saved, on A-series cams (and the G7 as well) the blue light in the **direct print** button will blink once ~~and on the S-series the orange light on top will blink once~~. Since build #103, S-series cams now use the blue LED as busy indicator too.

Here is a short explanation how to process RAW files on your computer.

Noise Reduction (*CHDK Builds #144 and later*)

NOTE: these settings **also** affect JPG image files **whether RAW is turned on or not!**

Auto -- Dark-frame-subtraction for noise-reduction behaves as normal. Any shutter-speeds slower than 1-second have a dark-frame-subtraction applied to them.

Off -- Dark-frame-subtraction is **always off**. (let me insert a personal WHOO-HOO!!!) This means that

you can now avoid the dark-frame subtraction on **all** shutter speeds. When tested on an S3 with an intervalometer-script with RAW **on**, 4 exposures of 15-seconds each took approx. 1-minute, 20-seconds. Meaning there was about a 5 second overhead for saving the RAW file + JPG processing. Instead of 33 seconds for each 15-second exposure, it now only takes about 20 seconds. This means that shooting for lightning can be greatly improved upon, the shutter being open 75% of the time with longer shutter speeds + RAW. The caveat, no dark-frame subtraction for noise-reduction, so be prepared to accept that trade-off. In lieu of auto dark-frame noise-reduction use this freeware utility BlackFrame NR and apply it manually. If you shoot in high-speed continuous mode and turn on the "Only first RAW in series" or turn off RAW saving altogether, then there is virtually **no** appreciable shutter lag between any 15-second frames! 4, 15-second exposures only takes 1-minute, 6 seconds with RAW on, or 1-minute, 4-seconds with RAW off. This means **your shutter is open approx. 95% of the time** on long shutter-speeds!

On -- Dark-frame-subtraction is **always on**. A slight delay will be added to every shutter speed for noise-reduction. This can solve hot-pixel problems. By always performing a dark-frame subtraction the hot-pixels will always be removed from any image.

After dark frame subtract (*CHDK Builds #136 and earlier*)

Camera on long exposures takes the

second "dark" shoot which is subtracted from the actual picture. So, by now, only first RAW (before dark frame subtraction) was saved. On short exposures it does not matter because there is no dark frame subtraction performed. But on long exposures it leads to noisy RAW with lots of hot pixels. Camera uses RAW with dark frame subtracted as a source for its JPEG. If this new option is activated, the second RAW (with dark frame subtracted), which has less noise, will overwrite the first one. But on the other hand it can lead to E16 error again.

*Use this option if it works for you.
If you get E16 errors, deactivate it.*

Only first RAW in series

Changes the behaviour of RAW saving in *continuous shooting* mode. When activated you will only get one RAW file, but the following shots will be faster since there is no RAW writing time delay for them.

RAW file in dir with JPEG

Save RAW-files in the same folder as the JPEG-files. If switched off, RAW-files are always saved in *100CANON* folder.

RAW file prefix

Prefix of RAW-file name.

RAW file extention

File extension of RAW-file.

On screen display

Show OSD

Show OSD elements or not. There's a shortcut available to toggle this on/off quickly: `[half shoot]+[right]`.

Show RAW/EXP state

Show status:

- **RAW** - Saving of RAW-files



is enabled.

- **EXP** - Over or Under exposure is detected.

Show misc values

Show values:

- **Z:** - Zoom position
- **F:** - Focus distance in meters
- **Av:** - Aperture value

Zoom value

Decides how the Zoom position (Z) is displayed when "show misc values" is active.

- **X** - zoom step number/magnification
- **FL** - actual focal length
- **EFL** - 35mm equivalent focal length

Show DOF calculator

Display a Depth-of-Field and Hyperfocal distance calculation when pressing the shutter button. (Unit: meters)

- **R1:** - nearest distance which will still be in focus
- **R2:** - farthest distance which will still be in focus
- **DOF:** - distance between these two points
- **HYP:** - hyperfocal distance

Compare R1 and R2 to the the actual focus distance (F) to see which parts of your picture will still be in focus. Set your focus point (F) to the hyperfocal distance (HYP) and everything from some near distance to infinity will be sharp.

OSD layout editor

Battery parameters

Grid Settings

Layout editor

Allows you to adjust the position of OSD elements on the screen. The following buttons are used:

- **Set** - to switch between elements.



- **Display** - to change the step-size, 1 or 10 pixels, of how far the selected display feature is moved with each direction press, affording precise placement.

Battery menu

Voltage MAX

Set battery voltage for 100% remaining.

(Default value: **5150** = 5.150v)
(G7 users try **8200**)

If you want a more accurate battery-meter: when inserting new batteries check their full-charge voltage with the 'Show Volts' feature and set this accordingly.

Voltage MIN

Set battery voltage for 0% remaining.

(Default value: **4550** = 4.550v)
(G7 users try **7000**)

Increase this value if you want more warning time before your batteries run out.

(G7 users see this discussion for more info)

25+ step

Change increment step for inputting new voltages (above).

Show percent

Show Battery Charge in Percentage, 100% >> 0%

Show volts

Show Battery Charge in Volts (in .001 volt increments)

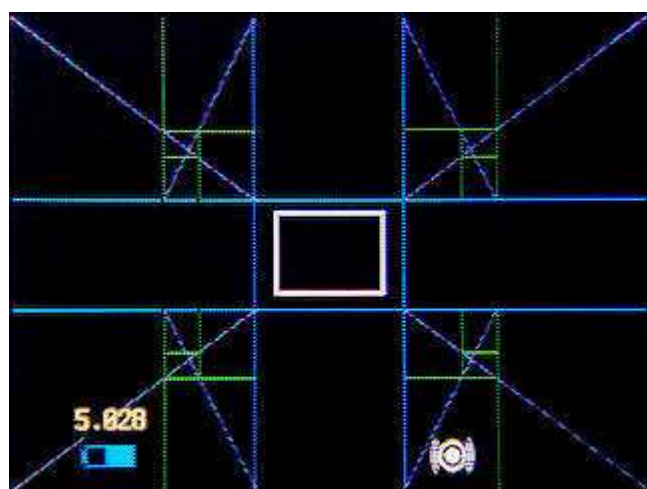
Show icon

Display Battery Charge Icon (icon turns red when voltage is low.)

Grid Settings Menu

Show Grid Lines

Enable or disable display of



composition-assist grids.

Load grid from file ...

Load a "Grid" graphic-command file of your choice, from sub-folder CHDK/Grids/. More information about creating and using them are available here [Grid Tutorial](#) and [User Contributions](#)

Current Grid

Displays the title of the grid-file presently loaded or in use.

Sample image shows the "Golden Grids" alignment assist in use.

Based on various aspects of the Golden Ratio.

Override grid colors (toggle on or off)

Line color Select the color that you want for grid lines when Override is turned on.

Fill color Select the color that you want for filled grid areas when Override is turned on.

This option is handy in situations where you have a compositional grid that you need or like to use but the present lighting or subject makes it difficult to use the predefined grid colors. Instead of rewriting the script to put in new colors (finding/using a computer, et.al.), you can just select new colors right in your camera. For example, if you don't like the transparent-gray that is in the user-submitted cropping grids, you can just select black for the "fill color" and those gray rectangular areas will now be black. Or for the shown example, if you select transparent-yellow for the "Line Color", then all lines in the Golden-Ratio grid will become that color, when Override-grid-color is turned on. This feature is also excellent for testing your final grid colors if you are designing/writing a new grid.



Histogram menu

Show live histogram

Enable display of Live Histogram.

There's also a shortcut available to toggle this on/off quickly:

`half shoot`+`up`. The Histogram will be shown when you half press the `shoot` button in Rec mode or Playback mode.

(Explanation of histograms and how to interpret them. Another good 2-part tutorial on histograms: Tones & Contrast and Luminance (Y) & Color (RGB) Histograms.)

Histogram layout

Select one of the 7 Histogram styles that you want to display.

- RGB - Red Green Blue
- Y - Luminance

Histogram mode

Histogram graph scale:

- linear
- logarithmic

Show histogram over/under EXP

Displays small warning diamonds in histogram window, and EXP is displayed (when enabled), when there's under or over-exposure.

Ignore boundary peaks

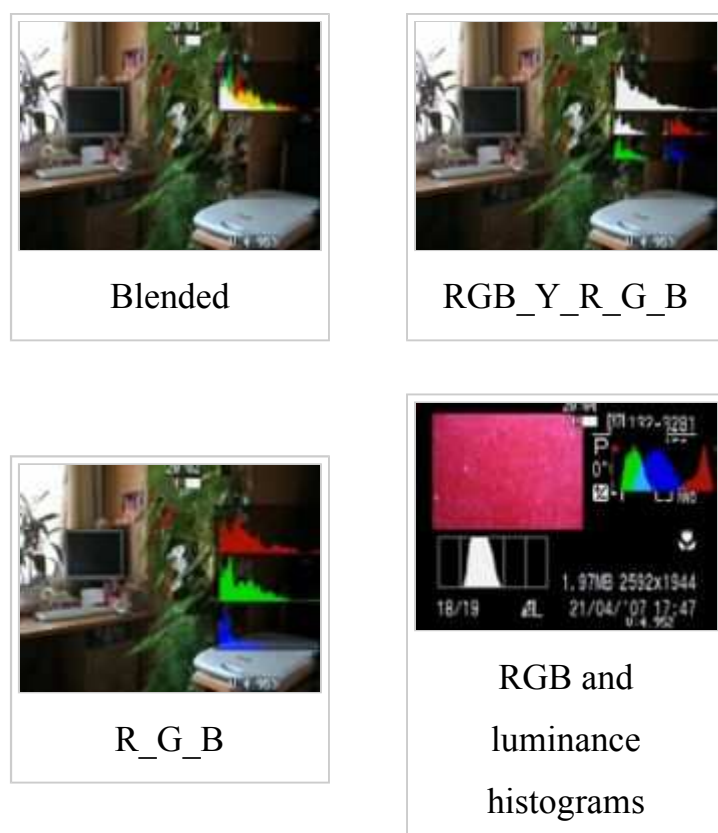
Does not take into account N boundary values during the normalization (scaling) of histogram. For example, if there are overexposure and/or underexposure, left and/or right peaks become large, and the remaining part of the histogram degenerates into thin strip on the bottom during normalization process. The purpose of this parameter is to avoid such situations by not taking into account the specified number of boundary values.

Auto magnify

Provides auto-magnification of the histogram Y-axis data in the event that the current plot covers less than 20% of the histogram plot area. The magnification factor changes dynamically so as to get at least 20% fill, facilitating visual inspection of the histogram.

Clipped peaks are marked in red color at the top. A number above the histogram shows the current magnification factor.

Note: The scaling of the histogram plot applies only to the Y-axis (vertical) direction.



Live histogram example

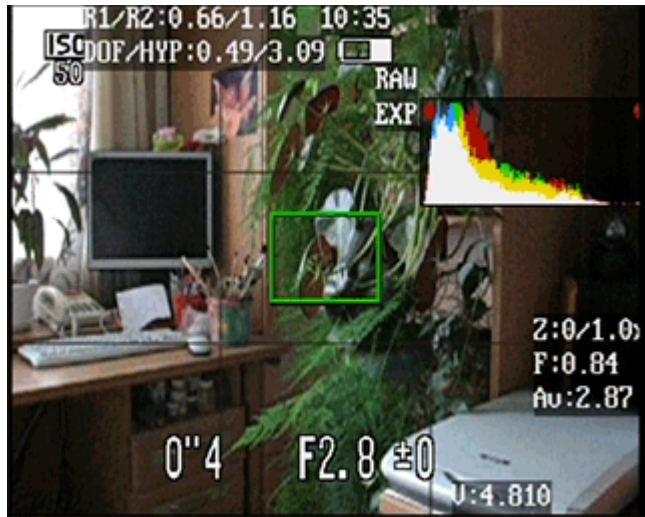
Zebra parameters

Zebra mode is a screen overlay which points out very bright/very dark areas. You can use it like the histogram to avoid over-/underexposure. It is shown in playback mode and record mode when you half press the [shoot] button. You can change the colors of the overlay in the "visual settings" menu.

Draw Zebra

Activates Zebra mode. There's a shortcut available to toggle this on/off quickly: `[half shoot]+[left]`.





Zebra mode

Choose the Zebra mode style.

- Zebra 1-2 - Draws moving, non-blinking zebra lines.
 - 1 = thin zebra-stripes, 2 = thick zebra-stripes
- Blink 1-3 - Draws solid, blinking parts. It will show the normal OSD elements during the pauses of the zebra overlay.
 - 1, 2, and 3 = number or seconds between blinks.
- Solid - Draws all light/dark parts of the image in a solid, non-blinking way.

Draw UnderExposure

Choose the amount of underexposure to be shown.

- 0 = off
- 1 = show only pure black as underexposed
- Numbers larger than 1 = show parts which are increasingly brighter as underexposed.

Draw OverExposure

Choose the amount of overexposure to be shown. Again: larger numbers = show more areas as overexposed.

Restore original screen

Restores the original camera icons and exposure information between Zebra mode blinks (when Zebra mode is set to blink).

Restore OSD

Restores CHDK's OSD icons and display information (DOF calc, Histogram, etc.) between Zebra mode blinks.

Draw over zebra

- Nothing
- Histo
- OSD

Enable/disable display of

Histogram or OSD-elements while Zebra mode is also being displayed.

Note: Normally if one of the Blink modes is in use and Restore OSD is enabled, you'll only see the histogram during part of the blink-cycle (when the Zebra mode is not visible). These option allow the histogram and OSD elements to be displayed at all times when Zebra mode is also visible -- during the usual half-shutter press, of course.



Script menu

HDK allows you to automate your camera by running "scripts", small and simple programs written in a short-hand version of BASIC. To run a script you load one into memory. Anytime you are in <ALT> mode your script is available for use. **While <ALT> is displayed on your screen**, you just press the shutter button. You may interrupt and exit a running script by just pressing the shutter button again. You may also *pause* a script just by exiting <ALT> mode, the script resuming right where it left off when you re-enter <ALT> mode. (This may come in handy if you need to change some settings in mid-script.) See this page for further information on writing scripts: Scripting Language. There's a shortcut available for the "Script parameters" menu: <ALT> + set.

Load script from file...

Upload a new file script from your CHDK/SCRIPTS/ folder.

Script shoot delay (.1s)

A small time-delay after a shot is taken, before the next command in the script is executed. You may

need to increase this to get some scripts to run properly. Or lower it to speed them up if the script will allow for it. If you can't get a script to run it is most likely this setting that is preventing it from working properly.

Current script

The name of the current script you are running.

Script parameters

Change any variables related to the script you are running. These values remain in memory until you change them. When running a new script be sure to set new values accordingly.

Script mini-console

This text is displayed as you run a script. Defined in the script itself by the "print ..." commands. A well-written script will have helpful messages to let the user know what is taking place while it is running or when special instructions are needed.



Special Builds Features

Fingalo's (and other's) new builds. See Downloads page for further info.

Autostart

When enabled <ALT> mode is entered and the currently active script-file will start running when the camera is turned on. When using **Remote Enable** and **Autostart** the camera will start up (in play mode) at the first press on the USB-remote. If the remote script is active the second press will enter record mode and take a picture. The script must have some command to enter record mode (like **shoot** or something similar).

Remote Enable

Enable/disable the remote function, (to be able to download files via USB-cable without turning the SD card write protection off).



Visual settings menu

Language

Lets you choose another language if you put the appropriate **.Ing**-file in the **CHDK/LANG/** folder of your SD card.

OSD codepage

Choose the Codepage.

Menu RBF font

Choose another font (RBF format) for the CHDK menus. If you have chosen a RBF font but want to switch back to the original built-in font, just choose an "illegal" RBF font (Try to load a uBASIC script as a RBF font, for example).

Colors

Change any of the display colors for all your text and icons. If you don't change them they will remain as their defaults. There are opaque colors and transparent colors, and also some "special effect" colors. Note that record mode and playback mode use different color tables. So it may happen that you pick a nice color in playback mode, and in rec mode it will look totally different. But there are also colors which will stay the same in both modes. Some examples for A-series cams: 0x11(white), 0xFF(black), 0x22(red), 0x55(green), 0x44 (transparent light grey)

Misc

Some fun and and some **extremely** helpful things you can do or use.



File browser

See what files are on your SD card.

Calendar

A handy perpetual calendar to look up dates.

Text file reader

Read any text file on your SD card.

Make a sub-directory

CHDK/BOOKS/ and put something there to read on vacation.

Games

Reversi, Sokoban

Flash-light

Turns your LCD panel into a flashlight! When in Record Mode and the LCD panel is swiveled facing forward, the LCD display turns all-white so you can see your way around in the dark, or to illuminate some close object to photograph. (Note: In actual use this does not work for photography purposes. The LCD turns dark during the actual exposure. But if you are ever lost on a hiking-trail on some dark and gloomy night, won't you be glad that your camera might save you? :-))

Show splash screen on load

Shows a splash-screen that the HDK Firmware is loading, for 2.5 seconds.

Use zoom buttons for MF

Use the zoom-rocker switch for adjusting focus in manual focus mode.

A-series: When activated, you can't zoom in manual focus mode.

S-series: Holding down the MF button (while in manual focus mode) allows use of the zoom-rocker for manual focus just as if you were using the up and down buttons to focus. Releasing the MF button allows the zoom-rocker to

function normally.

<ALT> mode button

(S2 IS and S3 IS only)

Select which button is used to enter <ALT> mode. Can be , , , or . A short press of your selected button enters/exits <ALT> mode, a slightly longer press to use the button's normal function.

Disable LCD off

Suppresses the camera's "Display Off" energy-saving functions in <ALT> mode. This means that your LCD/EVF screen **and camera** will stay on permanently instead of turning itself off according to your camera's Power Saving settings.

[No] - LCD/EVF display and camera turns off with the normal camera Power Savings menu settings.

[Alt] - LCD/EVF display (and camera) won't turn off while in <ALT> mode. Also useful if you want to override your auto power-down settings, just enter <ALT> mode.

[Script] - LCD/EVF display won't turn off while in <ALT> mode OR while a script is running. Useful for lengthy intervalometer or other scripts where seeing the display is valuable for important count-down timer or other messages contained in "print" statements. When not set to [Script] mode the script will continue to run and execute its commands, but the display will turn off according to your in-camera Power Saving settings. The LCD/EVF display turning on again whenever the script issues a

camera command, as if waking up the camera display manually by pressing any of the buttons. Since the camera is still in <ALT> mode after exiting a script, this will still override your camera's power-down settings.

Use with some caution. If you accidentally leave your camera on while in <ALT> mode and this is turned on your camera will not auto power-down according to your Power Saving settings.

HiCompressed movie (GrAnd's build #148)

Engages a high-compression ratio for all movie modes. File-size ratio being about 1/3rd to 1/4th smaller than normal. Some artifacts and posterizing become visible but the amount of extra time you can get out of each resolution may more than make up for this. Some space saving examples:

640x480, 30fps, 44kHz audio =
~30 minutes, 1G limit

640x480, 30fps, 11kHz audio =
~40 minutes, 1G limit

640x480, 15fps, 44kHz audio = 1
hour time limit

320x240, 15fps, 11kHz audio = 10
to 11 hours video recording space
on a 4G SD card.

Especially useful when running scripts for 1-hour video clips for surveillance recording. Or when needing to record audio-only tracks using uBASIC scripts, choosing the lowest resolution video and highest resolution audio for your soundtrack. (Audio-only recording is not available from uBASIC script commands so you have to record it as a video then extract the audio

track later. Since you'll be throwing away the video for an audio-only purpose the lowest resolution, highest-compressed video will afford the greatest file-size savings per audio recording.)

Draw palette

Show current palette

Show build info

Show current build of HDK

Show memory info

Free memory available.

Calendar

Shortcuts:

- **up**, **down** - change a year
- **left**, **right** - change a month



Build info

- Date of build.
- Time of build.
- Camera model.
- Version of original firmware.



Memory information



File browser

Allows to browse the SD-card.

The following buttons are used:

- **Up/Down** - cursor up/down
- **Zoom in/out** - page up/down
- **Erase** - delete files and directories
- **Right** - select/deselect files

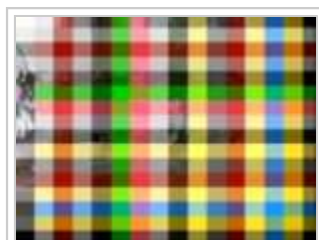


- **[Left]** - submenu with the following operations:
 - Cut
 - Copy
 - Paste
 - Delete
 - Select inverse - reverses the selection: everything what was selected will be unselected and vice versa.

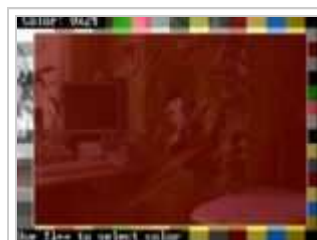


File deleting

This is particularly handy if you are shooting RAW files and using a filename extension other than .JPG for your RAW files. The camera does not recognize nor display RAW files directly. Deleting images from your SD card with the **[Erase]** button or the **[Erase All]** menu options will have no effect on the RAW files you have shot. If you need to delete RAW files you can use the 'File browser' and 'File deleting' feature. You can also delete whole non-empty directories, as long as they don't contain any subdirectories.



Palette



Palette

Palette browser

Can be used to test the colors and transparencies for use with menus, icons, and fonts. Or you can just enjoy all the pretty colors. Are you having a bad day? Choose a rose-colored transparency and view your world a better way. :-) Some of the subtle transparent colors have an interesting shift on the real-world view, acting like special-effects filters. Perhaps future updates of HDK might make use of this? (Your own extensive special-effects filter library.) Note that color palettes are different for rec mode and playback mode, see here.

Text Reader menu



Open new file...

Open a new file on your SD card (in the CHDK/BOOKS/ directory, if there is one).

Open last opened file

Opens the last file you were reading.

Select RBF font

Select the font (the default location opens a CHDK/FONTS/ folder off the root-directory of your SD card). You can download fonts here or here or add you own fonts using the RBF Editor.

Hint: If you have many fonts in many sizes and attributes, put all the files of the same font in sub-folder named for that font. Then you can just open each font's folder to select a new size, instead of tediously scrolling through dozens and dozens of fonts in all their sizes and attributes. A real time-saver to help in selecting the most legible font.

Codepage Win1251<->DOS

Text Encoding (to enable viewing of Windows or DOS text-file formats)

Wrap by words

Changes the automatic word wrapping behaviour. When activated, the text reader tries to keep the words intact.

Enable autoscroll

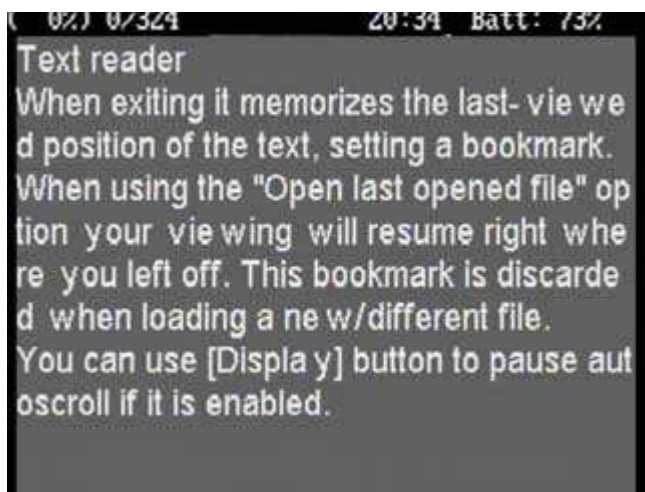
Automatically scrolls your Text Reader display according to the Autoscroll Delay setting.

Autoscroll delay (sec)

Time in seconds to pause between each Text Reader screen when Autoscroll is enabled.

Text reader

When exiting it memorizes the last-viewed position of the text, setting a bookmark. This does not work when you



just power off the cam - you have to exit the reader *and* the CHDK menu before. When using the "Open last opened file" option your viewing will resume right where you left off. This bookmark is discarded when loading a new/different file.

You can use **up/down** and **zoom in/zoom out** and **half shoot** for navigation in the text reader. You can use the **Display** button to pause autoscroll if it is enabled.

Old screenshot -- the text reader now wordwraps lines by complete words

Game: Reversi

The following buttons are used:

- Arrow buttons - move cursor
- **Set** - make a move
- **Erase** - start new game
- **Display** - show 'about' info



Game: Sokoban

The following buttons are used:

- Arrow buttons - move
- **Set** - choose level (*Moves* counter should be 0).
- **Erase** - restart current level
- **Display** - show 'about' info
- **zoom rocker** - undo/redo moves

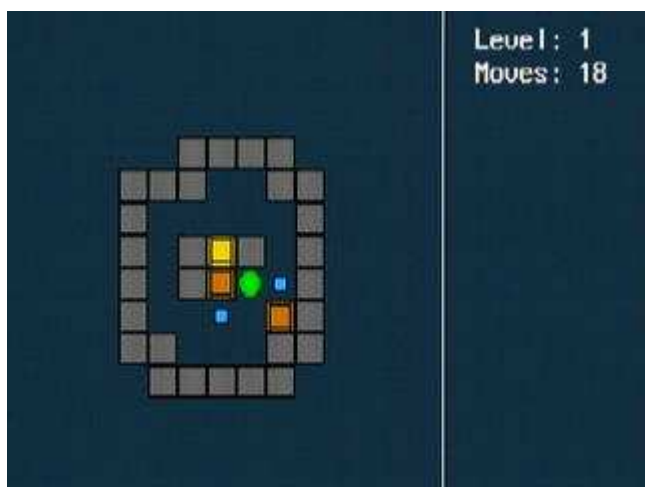
Rules --

You are the Green Worker-Dot

You have to push your orange boxes and leave them on blue destinations. When an orange crate is placed on a blue destination it will turn yellow.

When all your boxes are on a destination spot and have turned yellow you have won that round. Level 1 requires 108 moves. Level 2 requires 107 moves. Can you do it?

There's 116 games/levels. (Just in case you are curious, level



116 requires 207 moves.)



Special Build Features

The following features have instantly gained popularity and are now appearing in many builds by other authors. See the **Downloads** section for further information on obtaining these.

Tv Bracketing Value = Off, 1/3EV, 2/3EV, 1EV

This allows you to shoot unlimited exposure bracketing by using shutter speed. The EV value selected will set the desired exposure variation between each shot. When using Continuous or High-Speed Continuous mode in your camera, it will quickly fire-off as many bracketing exposures as you desire. They will be recorded in the following sequence, where X is your starting shutter-speed, and EV is the EV value that you selected:

X, -1*EV, +1*EV, -2*EV, +2*EV, -3*EV, +3*EV, etc...

If during your burst shooting the shutter-speed bottoms out or tops out at the limit of your camera, then it will shoot the alternating exposures no lower nor higher than your camera's limits, but it will continue to alternately increment or decrement at the other end of the EV values. For example, if you started out at 1/800 shutter speed, you would get:

1/800, 1/1600, 1/400, 1/3200,
1/200, 1/3200, 1/100, 1/3200 ...

Note: if you are using a build that also includes the extended shutter speeds up to 65-second exposures, then it will bottom out at that value, and not the camera's native 15-

second limit.

Override Shutter Speed = Off, 20", 25",
30", 40", 50", 65"

This will bypass the camera's slowest shutter-speed limit. When set to anything other than OFF your camera will use the selected shutter speed, in seconds. This override affects all other camera settings that will automatically or manually change your shutter-speed (as far as I know), until it is turned off again.

Some important things to remember: The shutter speed you select will not be displayed in your EVF/LCD display, it will still show whatever shutter-speed you select using normal camera controls. The only evidence of it working is noticing how much longer it takes to finally write an image to the SD card. The selected shutter-speed also won't appear in the EXIF data, it's always recorded in EXIF as 15" when using any shutter speed of 15" and longer. Remember to turn Override OFF after use, or the next day that you pick up your camera you may wonder why it is doing nothing the first time you press the shutter, but in reality it's taking a 65 second exposure. :-)

It is advisable to use this feature with Noise Reduction turned to OFF (in the RAW options menu), as that actually provides **less** noise. Instead depend on a nice Black-Frame Subtraction utility to remove any warm or hot pixels from your images. A nice freeware utility may be obtained from Mediachance's BlackFrame NR When these long shutter-speeds are used in conjunction with low ISO80 or

ISO100 you may obtain images with little to no noise in properly exposed areas of your images. If you are shooting with NR off it is also advisable to shoot a dark-frame (cap the lens, shoot another shot) as soon as you can after each or every few extra-long exposures, as the randomness of warm-pixels may behave differently over a period of use. If their intensities change over a period of time it will be less effective when using an "old" dark-frame for dark-frame subtraction methods. This seems to be less important at 15-second shutter speeds or shorter.

Any option you select for Noise Reduction (in the RAW menu) will still be applicable to these new shutter speeds. If you choose NR = Auto or On, then a 50 second exposure will take ~100 seconds, 50" for the exposure, 50" for the black-frame that needs to be recorded.

A note of minor interest: You may wonder why these shutter speeds were chosen, and why there's that strange 5 second extra jump for the 65" one. If you do the math you'll find out that these are on 1/3-stop settings. An easy way to understand this is to look at the camera's native 13-second shutter speed. 2X's that would be 26 (25 seconds on the menu), 2X's that would be 52 (50 seconds on the menu). This also accounts for a 15" exposure taking 33" seconds with a dark-frame, 15" is actually 16"+. (2X's 8") The speed choices are not exact but the closest approximation of 1/3-stop steps. The true shutter speed used will reflect true 1/3rd stops rather

than the number chosen. If you time a 50" shutter it is approximately 51-52 seconds long. That 5 second jump on the 65" speed is just rounding up for simplifying matters. This is no different than all cameras that used to (and still do) jump from 1/60 to 1/125 for a full-stop, so as to make the next full steps of 1/500, 1/1000 easier to comprehend. If a full-stop shutter-speed beyond was added, it would be on a menu as 2' (minutes) not 130". :)

Video Mode = Bitrate, Quality

Choose between 2 video compression schemes. Selecting the Bitrate option will use the Bitrate settings, selecting the Quality option will use the Quality settings. See the downloads discussion page EWAVR's VideoPlus Version, for more elaboration on this. Options of Quality, and Quality setting of 1X are the camera's native default compression.

Video Bitrate = 0.25x, 0.5x, 0.75x, 1x, 1.25x, 1.5x, 1.75x, 2x, 2.5x, 3x

A **Variable Bitrate** (constant quality) compression. The size of your video file will change depending on the image content. The more detail and motion in your video, the larger the file-size. The camera default is 1x.

Video Quality = 1 to 99

A **Variable Quality** (constant bitrate) compression. Every video file will have the same size for the same duration, but it won't compensate for changing image details. Useful when needing the absolute highest compression (least

quality), the absolute best in quality (least compression), or when needing to fit a video duration within a certain file-size. A value of 70 to 75 is about the same compression/quality as the camera's own. A value of 10 is the same as GrAnd's original HiCompressed Movie option (to give you an idea of the image-quality/compression latitude available now).

When using some of the high-quality settings, VB = 2x to 3x, or VQ = 93 or higher, be sure to use the fastest memory card available. These options easily reach data-rates of 6MBs or more, overwhelming the camera's buffer and/or card-speed. If your camera allows, and you absolutely need the best video quality available, it will help to choose lower audio-quality settings to offset the more massive amount of data being saved in the ultra-high quality video.

Any build of CHDK that has these features also had the 1-GIG file-size limit removed. However there is still the 1-hour limit and a 2-GIG limit. The 2-GIG limit most likely the FAT16/32 limitation on SD/HC cards. Dependable larger file-sizes weren't available until NTFS methods were implemented (i.e. WinXP, etc.) The 1-hour limit being imposed by Canon probably as a CCD over-use safety, as it still exists on all their newer cameras too that don't have the file-size limit.

Debug menu

Most options here are used by program developers to view internal memory locations in the camera or code (List of known Property Cases). However, there

is one interesting and one very important option here for the end-user:

Benchmark

Tests the speed of the camera and - more interestingly - the read/write speed of the SD card.

- *Write (RAW)* - calculating the speed of saving a data from the address of memory which contain RAW-image. It saves whole RAW-file size in single chunk.
- *Write (Mem)* - the same as above, but the source of a data is just regular memory of the camera (from first 32M address space).
- *Write (64k)* - the same as above, but writing a file by small 64Kb chunks.

Make card bootable...

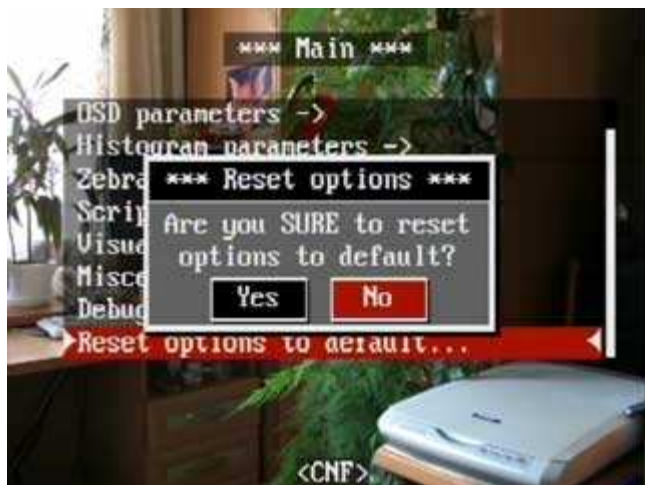
Enable an auto-loading feature for the CHDK firmware add-on. See this section "How to make CHDK Firmware Load Automatically" in the FAQ section.

Reset options

Reset all CHDK settings to default.

needs clarification -- just resets values in active memory (applied to this power-on session only)? or writes default values to the CHDK config file?

As soon as you leave menu or <alt> mode new options will be saved in config file as well. --GrAnd 19:48, 16 June 2007 (UTC)



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