The Rockbox Manual for Archos Ondio 128 SP

rockbox.org
February 10, 2019

Rockbox

http://www.rockbox.org/
Open Source Jukebox Firmware

Rockbox and this manual is the collaborative effort of the Rockbox team and its contributors. See the appendix for a complete list of contributors.

© 2003–2017 The Rockbox Team and its contributors, © 2004 Christi Alice Scarborough, © 2003 José Maria Garcia-Valdecasas Bernal & Peter Schlenker.

Version rUnversioned. Built using pdfLaTeX.

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.2 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled "GNU Free Documentation License".

Contents

1. Introduction **10**
- 1.1. Welcome . . . 10
- 1.2. Getting more help . . . 10
- 1.3. Naming conventions and marks . . . 11

2. Installation **12**
- 2.1. Before Starting . . . 12
- 2.2. Installing Rockbox . . . 12
  - 2.2.1. Automated Installation . . . 12
  - 2.2.2. Manual Installation . . . 14
  - 2.2.3. Finishing the install . . . 14
  - 2.2.4. Enabling Speech Support (optional) . . . 14
- 2.3. Running Rockbox . . . 15
- 2.4. Updating Rockbox . . . 15
- 2.5. Uninstalling Rockbox . . . 15
  - 2.5.1. Automatic Uninstallation . . . 15
  - 2.5.2. Manual Uninstallation . . . 15
- 2.6. Troubleshooting . . . 15

3. Quick Start **16**
- 3.1. Basic Overview . . . 16
  - 3.1.1. The player's controls . . . 16
  - 3.1.2. Turning the player on and off . . . 17
  - 3.1.3. Putting music on your player . . . 17
  - 3.1.4. The first contact . . . 17
  - 3.1.5. Basic controls . . . 17
  - 3.1.6. Basic concepts . . . 18
- 3.2. Customising Rockbox . . . 18
- 3.3. USB Power . . . 19

4. Browsing and playing **20**
- 4.1. File Browser . . . 20
  - 4.1.1. File Browser Controls . . . 21
  - 4.1.2. Context Menu . . . 21
  - 4.1.3. Virtual Keyboard . . . 23
- 4.2. Database . . . 24
  - 4.2.1. Introduction . . . 24

4.2.2. Initializing the Database . . . 24
4.2.3. The Database Menu . . . 24
4.2.4. Using the Database . . . 25
4.3. While Playing Screen . . . 26
4.3.1. WPS Key Controls . . . 27
4.3.2. Peak Meter . . . 28
4.3.3. The WPS Context Menu . . . 28
4.4. Working with Playlists . . . 31
4.4.1. Playlist terminology . . . 31
4.4.2. Creating playlists . . . 31
4.4.3. Adding music to playlists . . . 32
4.4.4. Modifying playlists . . . 33
4.4.5. Saving playlists . . . 34
4.4.6. Loading saved playlists . . . 34

5. The Main Menu 35
5.1. Introducing the Main Menu . . . 35
5.2. Navigating the Main Menu . . . 35
5.3. Recent Bookmarks . . . 36
5.4. Files . . . 36
5.5. Database . . . 37
5.6. Now Playing/Resume Playback . . . 37
5.7. Settings . . . 37
5.7.1. Sound Settings . . . 37
5.7.2. Playback Settings . . . 37
5.7.3. General Settings . . . 37
5.7.4. Theme Settings . . . 37
5.7.5. Manage Settings . . . 37
5.8. Playlists . . . 38
5.9. Plugins . . . 38
5.10. System . . . 38
5.11. Shortcuts . . . 39

6. Sound Settings 41
6.1. Volume . . . 41
6.2. Bass . . . 41
6.3. Volume Limit . . . 41
6.4. Treble . . . 42
6.5. Balance . . . 42
6.6. Channels . . . 42
6.7. Stereo Width . . . 42
6.8. Loudness . . . 43
6.9. Auto Volume . . . 43
6.10. Super Bass . . . 43

6.11. MDB – Micronas Dynamic Bass . . . 43

7. Playback Settings **45**
7.1. Shuffle . . . 45
7.2. Repeat . . . 45
7.3. Play Selected First . . . 46
7.4. Fast-Forward/Rewind . . . 46
7.5. Fade on Stop/Pause . . . 46
7.6. Party Mode . . . 46
7.7. Auto-Change Directory . . . 46
7.8. Constrain Auto-Change . . . 47
7.9. Last.fm Log . . . 47
7.10. Cuesheet Support . . . 47
7.11. Skip Length . . . 47
7.12. Prevent Track Skipping . . . 47
7.13. Rewind on Pause . . . 48

8. General Settings **49**
8.1. Playlist . . . 49
8.2. File View . . . 49
8.3. Database . . . 51
8.4. Display . . . 51
8.5. System . . . 53
8.5.1. Battery . . . 53
8.5.2. Limits . . . 53
8.5.3. Advanced Key Lock . . . 54
8.6. Startup/Shutdown . . . 54
8.6.1. Start Screen . . . 54
8.6.2. Idle Poweroff . . . 55
8.6.3. Sleep Timer . . . 55
8.7. Bookmarking . . . 55
8.8. Language . . . 57
8.9. Voice . . . 57

9. Theme Settings **60**

10. Plugins **62**
10.1. Games . . . 62
10.1.1. 2048 . . . 62
10.1.2. Blackjack . . . 63
10.1.3. BrickMania . . . 64
10.1.4. Bubbles . . . 65
10.1.5. Chessbox . . . 65
10.1.6. Chopper . . . 66

10.1.7. Dice . . . 67
10.1.8. Flipit . . . 67
10.1.9. Goban . . . 68
10.1.10. Jackpot . . . 72
10.1.11. Jewels . . . 72
10.1.12. Maze . . . 73
10.1.13. MazezaM . . . 73
10.1.14. Minesweeper . . . 74
10.1.15. Pegbox . . . 74
10.1.16. Pong . . . 75
10.1.17. Reversi . . . 76
10.1.18. Robotfindskitten . . . 76
10.1.19. Rockblox . . . 76
10.1.20. Rockblox1d . . . 77
10.1.21. Sgt-Puzzles . . . 77
10.1.22. Sliding Puzzle . . . 79
10.1.23. Snake . . . 79
10.1.24. Snake 2 . . . 80
10.1.25. Sokoban . . . 81
10.1.26. Solitaire . . . 82
10.1.27. Spacerocks . . . 83
10.1.28. Star . . . 83
10.1.29. Sudoku . . . 84
10.1.30. Wormlet . . . 85
10.1.31. Xobox . . . 88
10.2. Demos . . . 88
10.2.1. Bounce . . . 88
10.2.2. Credits . . . 89
10.2.3. Cube . . . 89
10.2.4. Demystify . . . 90
10.2.5. Fire . . . 90
10.2.6. Fractals . . . 91
10.2.7. Logo . . . 91
10.2.8. Matrix . . . 92
10.2.9. Mosaique . . . 92
10.2.10. Oscilloscope . . . 92
10.2.11. PictureFlow . . . 93
10.2.12. Plasma . . . 95
10.2.13. Rocklife . . . 95
10.2.14. Snow . . . 96
10.2.15. Starfield . . . 96
10.2.16. VU meter . . . 97
10.3. Viewers . . . 97
10.3.1. Shortcuts . . . 98

10.3.2. Chip-8 Emulator . . . 99
10.3.3. Frotz . . . 100
10.3.4. Image Viewer . . . 101
10.3.5. Movie Player . . . 102
10.3.6. Rockbox_flash . . . 102
10.3.7. Search . . . 102
10.3.8. Shopper . . . 102
10.3.9. Sort . . . 103
10.3.10. Text Viewer . . . 103
10.3.11. Theme Remove . . . 107
10.3.12. VBRfix . . . 108
10.3.13. Wavplay . . . 108
10.3.14. ZXBox . . . 109
10.4. Applications . . . 110
10.4.1. Battery Benchmark . . . 110
10.4.2. Calculator . . . 112
10.4.3. Chess Clock . . . 112
10.4.4. Dict . . . 113
10.4.5. Disk Tidy . . . 114
10.4.6. Firmware_flash . . . 115
10.4.7. Keybox . . . 115
10.4.8. Lrcplayer . . . 115
10.4.9. Main Menu Configuration . . . 118
10.4.10. md5sum . . . 118
10.4.11. Metronome . . . 119
10.4.12. One-Time Password Client . . . 122
10.4.13. Periodic Table . . . 123
10.4.14. Random Folder Advance Configuration . . . 123
10.4.15. Resistor Calculator . . . 124
10.4.16. Split Editor . . . 125
10.4.17. Stats . . . 128
10.4.18. Stopwatch . . . 128
10.4.19. Text Editor . . . 129

11. Advanced Topics **130**
11.1. Customising the User Interface . . . 130
11.1.1. Customising The Main Menu . . . 130
11.1.2. Getting Extras . . . 130
11.1.3. Loading Fonts . . . 130
11.1.4. Loading Languages . . . 131
11.1.5. UI Viewport . . . 131
11.2. Configuring the Theme . . . 132
11.2.1. Themeing – General Info . . . 132
11.2.2. Themes – Create Your Own . . . 132

11.2.3. Info Viewport (SBS only) . . . 134
11.2.4. Additional Fonts . . . 134
11.3. Managing Rockbox Settings . . . 137
11.3.1. Introduction to `.cfg` Files . . . 137
11.3.2. Specifications for `.cfg` Files . . . 137
11.3.3. The Manage Settings menu . . . 138
11.4. Firmware Loading . . . 139
11.4.1. Using ROLO (Rockbox Loader) . . . 139
11.5. Rockbox in Flash . . . 139
11.5.1. Introduction . . . 139
11.5.2. Terminology and Basic Operation . . . 140
11.5.3. Initial Flashing Procedure . . . 140
11.5.4. Updating the Rockbox Image in Flash . . . 141
11.5.5. Restoring the Original Flash ROM Contents . . . 142
11.6. Optimising battery runtime . . . 142
11.6.1. Peak Meter . . . 142
11.6.2. Audio format and bitrate . . . 142

A. File formats **143**
A.1. Supported file formats . . . 144

B. Album Art **145**
B.1. Limitations . . . 145
B.2. Where to put album art . . . 145

C. Theme Tags **147**
C.1. Status Bar . . . 147
C.2. Hardware Capabilities . . . 147
C.3. Information from the track tags . . . 148
C.4. Viewports . . . 148
C.5. Additional Fonts . . . 148
C.6. Misc Coloring Tags . . . 149
C.7. Power Related Information . . . 149
C.8. Information about the file . . . 150
C.9. Playlist/Song Info . . . 151
C.10. Playlist Viewer . . . 151
C.11. Runtime Database . . . 152
C.12. Hold . . . 152
C.13. Virtual LED . . . 152
C.14. Repeat Mode . . . 152
C.15. Playback Mode . . . 153
C.16. Current Screen . . . 153
C.17. List Title (`.sbs` only) . . . 154
C.18. Changing Volume . . . 154

C.19. Settings . . . 154
C.20. Images . . . 155
C.21. Alignment and language direction . . . 156
C.22. Conditional Tags . . . 157
C.23. Subline Tags . . . 157
C.24. Text Translation . . . 158
C.25. Bar Tags . . . 158
C.25.1. Options . . . 158
C.26. Other Tags . . . 159

D. Config file options **161**

E. Menu Overview **165**

F. User feedback **166**
F.1. Bug reports . . . 166
F.1.1. Rules for submitting new bug reports . . . 166
F.2. Feature ideas . . . 166
F.2.1. Rules for submitting a new feature idea . . . 166
F.2.2. Features we will not implement . . . 167

G. Credits **169**

H. Licenses **174**
H.1. GNU Free Documentation License . . . 174
H.2. The GNU General Public License . . . 182

1. Introduction

1.1. Welcome

This is the manual for Rockbox. Rockbox is an open source firmware replacement for a growing number of digital audio players. Rockbox aims to be considerably more functional and efficient than your device's stock firmware while remaining easy to use and customisable. Rockbox is written by users, for users. Not only is it free to use, it is also released under the GNU General Public License (GPL), which means that it will always remain free both to use and to change.

Rockbox has been in development since 2001, and receives new features, tweaks and fixes each day to provide you with the best possible experience on your digital audio player. A major goal of Rockbox is to be simple and easy to use, yet remain very customisable and configurable. We believe that you should never need to go through a series of menus for an action you perform frequently. We also believe that you should be able to configure almost anything about Rockbox you could want, pertaining to functionality. Another top priority of Rockbox is audio playback quality – Rockbox, for most models, includes a wider range of sound settings than the device's original firmware. A lot of work has been put into making Rockbox sound the best it can, and improvements are constantly being made. All models have access to a large number of plugins, including many games, applications, and graphical "demos". You can load different configurations quickly for different purposes (e.g. a large font for in your car, different sound settings for at home). Rockbox features a very wide range of languages, and all supported models also have the ability to talk to you – menus can be voiced and filenames spelled out or spoken.

1.2. Getting more help

This manual is intended to be a comprehensive introduction to the Rockbox firmware. There is, however, more help available. The Rockbox website at http://www.rockbox.org/ contains very extensive documentation and guides written by members of the Rockbox community and this should be your first port of call when looking for further help.

If you cannot find the information you are searching for on the Rockbox website there are a number of support channels you should have a look at. You can try the Rockbox forums located at http://forums.rockbox.org/. The mailing lists are another option, and can be found at http://www.rockbox.org/mail/. From that page you can subscribe to the lists and browse the archives. To search the list archives simply use the search field that is located on the left side of the website. Furthermore, you can ask on IRC. The

main channel for Rockbox is `#rockbox` on irc://irc.freenode.net. Many helpful developers and users are usually around. Just join and ask your question (don't ask to ask!) – if someone knows the answer you'll usually get an answer pretty quickly. More information including IRC logs can be found at http://www.rockbox.org/irc/. We also have a web client so that you can join the Rockbox IRC channel without needing to install additional software onto your computer.

If you think you have found a bug please make sure it actually is a bug and is still present in the most recent version of Rockbox. You should try to confirm that by using the above mentioned support channels first. After that you can submit that issue to our tracker. Refer to section F (page 166) for details on how to use the tracker.

1.3. Naming conventions and marks

We have some conventions (especially for naming) that are intended to be consistent throughout this manual.

Manufacturer and product names are formatted in accordance with the standard rules of English grammar, e.g. "Archos playback is currently unsupported". Manufacturer and model names are proper nouns, and thus are written beginning with a capital letter.

This manual has some parts that are marked with icons on the margin to help you finding important parts or parts you could skip. The following icons are used:

Note: This indicates a note. A note starts always with the text "Note". In order to make finding notes easier each one is accompanied by an icon in the margin as here. Notes are used to mark useful information that may help you to get the most out of Rockbox.

Warning: This is a warning. In contrast to notes mentioned above, a warning should be taken more seriously. Whereas ignoring notes will not cause any serious damage, ignoring warnings *could* cause serious damage to your player. You really should read the warnings, especially if you are new to Rockbox.

This icon marks a section that is intended especially for the blind and visually impaired. As they cannot read the manual in the same way sighted people do we have added some additional descriptions. If you are not blind or visually impaired you can probably completely skip these blocks. To make this easier, there is an icon shown in the margin on the right.

Links to the wiki are abbreviated by the name of the wiki page. Those names are still linked so you can simply follow them like any other link in this manual. If you want to access a wiki page manually go to ☞ http://www.rockbox.org/wiki/ and type the page name in the "Go" box at the top of the page. Links to wiki pages are also indicated by the symbol ☞ in front of the page name.

2. Installation

Installing Rockbox is generally a quick and easy procedure. However before beginning there are a few important things to know.

2.1. Before Starting

USB connection. To transfer Rockbox to your player you need to connect it to your computer. For manual installation/uninstallation, or should autodetection fail during automatic installation, you need to know where to access the player. On Windows this means you need to know the drive letter associated with the player. On Linux you need to know the mount point of your player. On Mac OS X you need to know the volume name of your player.

2.2. Installing Rockbox

There are two ways to install Rockbox: automated and manual. The automated way is the preferred method of installing Rockbox for the majority of people. Rockbox Utility is a graphical application that does almost everything for you. However, should you encounter a problem, then the manual way is still available to you.

Rockbox itself comes as a single package. There is no need to install additional software to run Rockbox.

Apart from the required parts there are some addons you might be interested in installing.

Fonts. Rockbox can load custom fonts. The fonts are distributed as a separate package and thus need to be installed separately. They are not required to run Rockbox itself but a lot of themes require the fonts package to be installed.

Themes. The appearance of Rockbox can be customised by themes. Depending on your taste you might want to install additional themes to change the look of Rockbox.

2.2.1. Automated Installation

To automatically install Rockbox, download the official installer and housekeeping tool Rockbox Utility. It allows you to:

- Automatically install all needed components for using Rockbox ("Minimal Installation").

- Automatically install all suggested components ("Complete Installation").
- Selectively install optional components.
- Install additional fonts and themes.
- Install voice files and generate talk clips.
- Uninstall all components you installed using Rockbox Utility.

Prebuilt binaries for Windows, Linux and Mac OS X are available at the ☞RockboxUtility wiki page.

When first starting Rockbox Utility run "Autodetect", found in the configuration dialog (File → Configure). Autodetection can detect most player types. If autodetection fails or is unable to detect the mountpoint, make sure to enter the correct values. The mountpoint indicates the location of the player in your filesystem. On Windows, this is the drive letter the player gets assigned, on other systems this is a path in the filesystem.

Choosing a Rockbox version

There are three different versions of Rockbox available from the Rockbox website: Release version, current build and archived daily build. You need to decide which one you want to install and get the appropriate version for your player. If you select either "Minimal Installation" or "Complete Installation" from the "Quick Start" tab, then Rockbox Utility will automatically install the release version of Rockbox. Using the "Installation" tab will allow you to select which version you wish to install.

Release. The release version is the latest stable release, free of known critical bugs. For a manual install, the current stable release of Rockbox is available at http://www.rockbox.org/download/.

Development Build. The development build is built at each change to the Rockbox source code repository and represents the current state of Rockbox development. This means that the build could contain bugs but most of the time is safe to use. For a manual install, you can download the current build from http://build.rockbox.org/.

Archived Build. In addition to the release version and the current build, there is also an archive of daily builds available for download. These are built once a day from the latest source code in the repository. For a manual install, you can download archived builds from http://www.rockbox.org/daily.shtml.

Note: Because current and archived builds are development versions that change frequently, they may behave differently than described in this manual, or they may introduce new (and potentially annoying) bugs. Unless you wish to try the latest and

greatest features at the price of possibly greater instability, or you wish to help with development, you should stick with the release.

Please now go to section 2.2.3 (page 14) to complete the installation procedure.

2.2.2. Manual Installation

The manual installation method is still available to you, should you need or desire it by following the instructions below. If you have used Rockbox Utility to install Rockbox, then you do not need to follow the next section and can skip straight to section 2.2.3 (page 14)

Installing the firmware

1. Download your chosen version of Rockbox from the links in the previous section.
2. Connect your player to the computer via USB as described in the manual that came with your player.
3. Take the `.zip` file that you downloaded and use the "Extract all" command of your unzip program to extract the files onto your player.

Note: The entire contents of the `.zip` file should be extracted directly to the root of your player's drive. Do not try to create a separate directory on your player for the Rockbox files! The `.zip` file already contains the internal structure that Rockbox needs.

If the contents of the `.zip` file are extracted correctly, you will have a file called `ajbrec.ajz` in the main directory of your player's drive, and also a directory called `.rockbox`, which contains a number of other directories and system files needed by Rockbox.

2.2.3. Finishing the install

Safely eject / unmount the USB drive, unplug the cable and restart.

2.2.4. Enabling Speech Support (optional)

If you wish to use speech support you will also need a voice file. Voice files allow Rockbox to speak the user interface to you. Rockbox Utility can install an English voice file, or you can download it from http://www.rockbox.org/daily.shtml and unzip it to the root of your player. Rockbox Utility can also aid you in the creation of voice files with different voices or in other languages if you have a suitable speech engine installed on your computer. Voice menus are enabled by default and will come into effect after a reboot. See section 8.9 (page 57) for details on voice settings. Rockbox Utility can also aid in the production of talk files, which allow Rockbox to speak file and folder names.

2.3. Running Rockbox

When you turn the unit on, Rockbox should load.

2.4. Updating Rockbox

Rockbox can be easily updated with Rockbox Utility. You can also update Rockbox manually – download a Rockbox build as detailed above, and unzip the build to the root directory of your player as in the manual installation stage. If your unzip program asks you whether to overwrite files, choose the "Yes to all" option. The new build will be installed over your current build.

Note: If you use Rockbox Utility be aware that it cannot detect manually installed components.

2.5. Uninstalling Rockbox

2.5.1. Automatic Uninstallation

You can uninstall Rockbox automatically by using Rockbox Utility. If you installed Rockbox manually you can still use Rockbox Utility for uninstallation but will not be able to do this selectively.

2.5.2. Manual Uninstallation

If you would like to go back to using the original Archos software, connect the player to your computer, and delete the `ajbrec.ajz` file.

If you wish to clean up your disk, you may also wish to delete the `.rockbox` directory and its contents. Turn the Archos off. Turn the player back on and the original Archos software will load.

2.6. Troubleshooting

"File Not Found" If you receive a "File Not Found" from the bootloader, then the bootloader cannot find the Rockbox firmware. This is usually a result of not extracting the contents of the `.zip` file to the proper location, and should not happen when Rockbox has been installed with Rockbox Utility.

To fix this, either install Rockbox with the Rockbox Utility which will take care of this for you, or recheck the Manual Install section to see where the files need to be located.

3. Quick Start

3.1. Basic Overview

3.1.1. The player's controls

Throughout this manual, the buttons on the player are labelled according to the picture above. Whenever a button name is prefixed by "Long", a long press of approximately one second should be performed on that button. The buttons are described in detail in the following paragraph. Additional information for blind users is available on the Rockbox website at ☞BlindFAQ.

The main characteristic of the Ondio case is the indent on its lower right side, which is the MMC slot. Holding the player with this slot in the described position you'll find the following:

On the curved top, from left to right, are the headphone socket, the **On/Off** button,. Apart from the already mentioned MMC slot, you will find the USB connector on the player's right side. Below the LCD, at approximately the center of the player, there is the main button pad of the player. The centre of the button pad dips inward and helps to operate the directional keys from there. Located on a two-way button strip are the **Left** and **Right** keys, with **Up** above it and **Down** below it. The raised button positioned in the lower left of this round crosspad is labelled **Mode**.

3.1.2. Turning the player on and off

To turn on and off your Rockbox enabled player use the following keys:

Key	Action
On/Off	Start Rockbox
Long **On/Off**	Shutdown Rockbox

On shutdown, Rockbox automatically saves its settings.

In the unlikely event of a software failure, hardware poweroff or reset can be performed by holding down **On/Off** until the player shuts off or reboots.

3.1.3. Putting music on your player

With the player connected to the computer as an MSC/UMS device (like a USB Drive), music files can be put on the player via any standard file transfer method that you would use to copy files between drives (e.g. Drag-and-Drop). Files may be placed wherever you like on the player, but it is strongly suggested *NOT* to put them in the `/.rockbox` folder and instead put them in any other folder, e.g. `/`, `/music` or `/audio`. The default directory structure that is assumed by some parts of Rockbox (missing-tag fallback in some WPSes) uses the parent directory of a song as the Album name, and the parent directory of that folder as the Artist name. WPSes may display information incorrectly if your files are not properly tagged, and you have your music organized in a way different than they assume when attempting to guess the Artist and Album names from your filetree.

3.1.4. The first contact

After you have first started the player, you'll be presented by the Main Menu. From this menu you can reach every function of Rockbox, for more information (see section 5.1 (page 35)). To browse the files on your player, select Files (see section 4.1 (page 20)), and to browse in a view that is based on the meta-data[1] of your audio files, select Database (see section 4.2 (page 24)).

3.1.5. Basic controls

When browsing files and moving through menus you usually get a list view presented. The navigation in these lists are usually the same and should be pretty intuitive. In the tree view use **Down** and **Up** to move around the selection. Use **Right** to select an item. When browsing the file system selecting an audio file plays it. The view switches to the "While playing screen", usually abbreviated as "WPS" (see section 4.3 (page 26). The dynamic playlist gets replaced with the contents of the current directory. This way you

[1] ID3 Tags, Vorbis comments, etc.

can easily treat directories as playlists. The created dynamic playlist can be extended or modified while playing. This is also known as "on-the-fly playlist". To go back to the File Browser stop the playback with the Long **On/Off** button or return to the file browser while keeping playback running using **Mode**. In list views you can go back one step with **Left**.

3.1.6. Basic concepts

Playlists

Rockbox is playlist oriented. This means that every time you play an audio file, a so-called "dynamic playlist" is generated, unless you play a saved playlist. You can modify the dynamic playlist while playing and also save it to a file. If you do not want to use playlists you can simply play your files directory based. Playlists are covered in detail in section 4.4 (page 31).

Menu

From the menu you can customise Rockbox. Rockbox itself is very customisable. Also there are some special menus for quick access to frequently used functions.

Context Menu

Some views, especially the file browser and the WPS have a context menu. From the file browser this can be accessed with Long **Right**. The contents of the context menu vary, depending on the situation it gets called. The context menu itself presents you with some operations you can perform with the currently highlighted file. In the file browser this is the file (or directory) that is highlighted by the cursor. From the WPS this is the currently playing file. Also there are some actions that do not apply to the current file but refer to the screen from which the context menu gets called. One example is the playback menu, which can be called using the context menu from within the WPS.

3.2. Customising Rockbox

Rockbox' User Interface can be customised using "Themes". Themes usually only affect the visual appearance, but an advanced user can create a theme that also changes various other settings like file view, LCD settings and all other settings that can be modified using `.cfg` files. This topic is discussed in more detail in section 11.3 (page 137). The Rockbox distribution comes with some themes that should look nice on your player.

Note: Some of the themes shipped with Rockbox need additional fonts from the fonts package, so make sure you installed them. Also, if you downloaded additional themes from the Internet make sure you have the needed fonts installed as otherwise the theme may not display properly.

3.3. USB Power

To power your player over USB, hold **Mode** while plugging it in. This will prevent it from connecting to your computer and let you continue to use it normally. Your player must already be in Rockbox for this to function.

4. Browsing and playing

4.1. File Browser

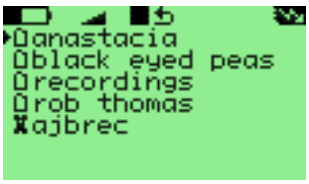

Figure 4.1.: The file browser

Rockbox lets you browse your music in either of two ways. The File Browser lets you navigate through the files and directories on your player, entering directories and executing the default action on each file. To help differentiate files, each file format is displayed with an icon.

The Database Browser, on the other hand, allows you to navigate through the music on your player using categories like album, artist, genre, etc.

You can select whether to browse using the File Browser or the Database Browser by selecting either Files or Database in the Main Menu. If you choose the File Browser, the Show Files setting lets you select what types of files you wish to view. See section 8.2 (page 50) for more information on the Show Files setting.

Note: The File Browser allows you to manipulate your files in ways that are not available within the Database Browser. Read more about Database in section 4.2 (page 24). The remainder of this section deals with the File Browser.

Unlike the Archos Firmware, Rockbox provides multivolume support for the Multi-MediaCard, this means the player can access both data volumes (internal memory and the MMC), thus being able to for instance, build playlists with files from both volumes. In the File Browser a new directory will appear as soon as the device has read the content after inserting the card. This new directory's name is generated as `<MMC1>`, and will behave exactly as any other directory on the player.

4.1.1. File Browser Controls

Key	Action
Up/Down	Go to previous/next item in list. If you are on the first/last entry, the cursor will wrap to the last/first entry.
Left	Go to the parent directory.
Right	Execute the default action on the selected file or enter a directory.
Mode	If there is an audio file playing, return to the While Playing Screen (WPS) without stopping playback.
On/Off	Stop audio playback.
Long **Right**	Enter the Context Menu.
Long **Mode**	Enter the Main Menu.

4.1.2. Context Menu

Figure 4.2.: The Context Menu

The Context Menu allows you to perform certain operations on files or directories. To access the Context Menu, position the selector over a file or directory and access the context menu with Long **Right**.

Note: The Context Menu is a context sensitive menu. If the Context Menu is invoked on a file, it will display options available for files. If the Context Menu is invoked on a directory, it will display options for directories.

The Context Menu contains the following options (unless otherwise noted, each option pertains both to files and directories):

Playlist. Enters the Playlist Submenu (see section 4.4.3 (page 32)).

Playlist Catalogue. Enters the Playlist Catalogue Submenu (see section 4.4.2 (page 32)).

Rename. This function lets the user modify the name of a file or directory.

Cut. Copies the name of the currently selected file or directory to the clipboard and marks it to be 'cut'.

Copy. Copies the name of the currently selected file or directory to the clipboard and marks it to be 'copied'.

Paste. Only visible if a file or directory name is on the clipboard. When selected it will move or copy the clipboard to the current directory.

Delete. Deletes the currently selected file. This option applies only to files, and not to directories. Rockbox will ask for confirmation before deleting a file. Press **Right** to confirm deletion or any other key to cancel.

Delete Directory. Deletes the currently selected directory and all of the files and subdirectories it may contain. Deleted directories cannot be recovered. Use this feature with caution!

Open with. Runs a viewer plugin on the file. Normally, when a file is selected in Rockbox, Rockbox automatically detects the file type and runs the appropriate plugin. The Open With function can be used to override the default action and select a viewer by hand. For example, this function can be used to view a text file even if the file has a non-standard extension (i.e., the file has an extension of something other than `.txt`). See section 10.3 (page 97) for more details on viewers.

Create Directory. Create a new directory in the current directory on the disk.

Properties. Shows properties such as size and the time and date of the last modification for the selected file. If used on a directory, the number of files and subdirectories will be shown, as well as the total size.

Start File Browser Here. This option allows users to set the currently selected directory as the default start directory for the file browser. This option is not available for files.

Note: If you have Auto-Change Directory and Constrain Auto-Change enabled, the directories returned will be constrained to the directory you have chosen here and those below it. See section 7.8 (page 47)

Add to Shortcuts. Adds a link to the selected item in the `shortcuts.link` file. If the file does not already exist it will be created in the root directory. Note that if you create a shortcut to a file, Rockbox will not open it upon selecting, but simply bring you to its location in the File Browser.

4.1.3. Virtual Keyboard

Figure 4.3.: The virtual keyboard

This is the virtual keyboard that is used when entering text in Rockbox, for example when renaming a file or creating a new directory. The virtual keyboard can be easily changed by making a text file with the required layout. More information on how to achieve this can be found on the Rockbox website at ☞LoadableKeyboardLayouts.

Also you can switch to Morse code input mode by changing the Use Morse Code Input setting.

Note: When the cursor is on the input line, **Mode** deletes the preceding character ✍

Key	Action
Left / Right	Move the cursor on the virtual keyboard. If you move out of the picker area, you get the previous/next page of characters (if there is more than one).
Up / Down	Move the cursor on the virtual keyboard. If you move out of the picker area you get to the line edit mode.
Mode	Insert the selected keyboard letter at the current line cursor position.
Long **Mode**	Exit the virtual keyboard and save any changes.
On/Off	Exit the virtual keyboard without saving any changes.
Up	Tap to select a character in Morse code input mode.

4.2. Database

4.2.1. Introduction

This chapter describes the Rockbox music database system. Using the information contained in the tags (ID3v1, ID3v2) in your audio files, Rockbox builds and maintains a database of the music files on your player and allows you to browse them by Artist, Album, Genre, Song Name, etc. The criteria the database uses to sort the songs can be completely customised. More information on how to achieve this can be found on the Rockbox website at ☞DataBase.

4.2.2. Initializing the Database

The first time you use the database, Rockbox will scan your disk for audio files. This can take quite a while depending on the number of files on your player. This scan happens in the background, so you can choose to return to the Main Menu and continue to listen to music. If you shut down your player, the scan will continue next time you turn it on. After the scan is finished you may be prompted to restart your player before you can use the database.

Ignoring Directories During Database Initialization

You may have directories on your player whose contents should not be added to the database. Placing a file named `database.ignore` in a directory will exclude the files in that directory and all its subdirectories from scanning their tags and adding them to the database. This will speed up the database initialization.

If a subdirectory of an 'ignored' directory should still be scanned, place a file named `database.unignore` in it. The files in that directory and its subdirectories will be scanned and added to the database.

4.2.3. The Database Menu

Auto Update If Auto update is set to on, each time the player boots, the database will automatically be updated.

Initialize Now You can force Rockbox to rescan your disk for tagged files by using the Initialize Now function in the Database Menu.

Warning: Initialize Now removes all database files (removing runtimedb data also) and rebuilds the database from scratch.

Update Now Update now causes the database to detect new and deleted files Unlike Initialize Now, the Update Now function does not remove runtime database information.

Gather Runtime Data When enabled, rockbox will record how often and how long a track is being played, when it was last played and its rating. This information can

be displayed in the WPS and is used in the database browser to, for example, show the most played, unplayed and most recently played tracks.

Export Modifications This allows for the runtime data to be exported to the file `/.rockbox/database_changelog.txt`, which backs up the runtime data in ASCII format. This is needed when database structures change, because new code cannot read old database code. But, all modifications exported to ASCII format should be readable by all database versions.

Import Modifications. Allows the `/.rockbox/database_changelog.txt` backup to be conveniently loaded into the database. If Auto Update is enabled this is performed automatically when the database is initialized.

4.2.4. Using the Database

Once the database has been initialized, you can browse your music by Artist, Album, Genre, Song Name, etc. To use the database, go to the Main Menu and select Database.

Note: You may need to increase the value of the Max Entries in File Browser setting (Settings → General Settings → System → Limits) in order to view long lists of tracks in the ID3 database browser.

There is no option to turn off database completely. If you do not want to use it just do not do the initial build of the database and do not load it to RAM.

Tag	Type	Origin
filename	string	system
album	string	id tag
albumartist	string	id tag
artist	string	id tag
comment	string	id tag
composer	string	id tag
genre	string	id tag
grouping	string	id tag
title	string	id tag
bitrate	numeric	id tag
discnum	numeric	id tag
year	numeric	id tag
tracknum	numeric	id tag/filename
autoscore	numeric	runtime db
lastplayed	numeric	runtime db
playcount	numeric	runtime db
Pm (play time – min)	numeric	runtime db
Ps (play time – sec)	numeric	runtime db
rating	numeric	runtime db
commitid	numeric	system
entryage	numeric	system
length	numeric	system
Lm (track len – min)	numeric	system
Ls (track len – sec)	numeric	system

4.3. While Playing Screen

The While Playing Screen (WPS) displays various pieces of information about the currently playing audio file. The appearance of the WPS can be configured using WPS configuration files. The items shown depend on your configuration – all items can be turned on or off independently. Refer to section C (page 147) for details on how to change the display of the WPS.

- Status bar: The Status bar shows Battery level, USB power mode, key lock status, memory access indicator. In contrast to all other items, the status bar is always at the top of the screen.
- (Scrolling) path and filename of the current song.
- The ID3 track name.

- The ID3 album name.
- The ID3 artist name.
- Bit rate. VBR files display average bitrate and "(avg)"
- Elapsed and total time.
- A slidebar progress meter representing where in the song you are.
- Peak meter.

Note:

- The number of lines shown depends on the size of the font used.
- The peak meter is only visible if you turn off the status bar or if using a small font that gives 8 or more display lines.

See section 11.2 (page 132) for details of customising your WPS (While Playing Screen).

4.3.1. WPS Key Controls

Key	Action
Up / **Down**	Volume up/down.
Left	Go to beginning of track, or if pressed while in the first seconds of a track, go to the previous track.
Long **Left**	Rewind in track.
Right	Go to the next track.
Long **Right**	Fast forward in track.
On/Off	Toggle play/pause.
Long **On/Off**	Stop playback.
Mode	Return to the File Browser / Database.
Long **Mode**	Enter WPS Context Menu.
Long **Mode** twice	Enter Main Menu via the WPS Context Menu.
Mode+Down	Key lock (software hold switch) on/off.
Short **Right** + Long **Right**	Skip to the next directory.
Short **Left** + Long **Left**	Skip to the previous directory.

4.3.2. Peak Meter

The peak meter can be displayed on the While Playing Screen and consists of several indicators.

The bar: This is the wide horizontal bar. It represents the current volume value.

The peak indicator: This is a little vertical line at the right end of the bar. It indicates the peak volume value that occurred recently.

The clip indicator: This is a little black block that is displayed at the very right of the scale when an overflow occurs. It usually does not show up during normal playback unless you play an audio file that is distorted heavily.

Note: Note that the clip detection is not very precise. Clipping might occur without being indicated.

The scale: Between the indicators of the right and left channel there are little dots. These dots represent important volume values. In linear mode each dot is a 10% mark. In dBFS mode the dots represent the following values (from right to left): 0 dB, -3 dB, -6 dB, -9 dB, -12 dB, -18 dB, -24 dB, -30 dB, -40 dB, -50 dB, -60 dB.

4.3.3. The WPS Context Menu

Like the context menu for the File Browser, the WPS Context Menu allows you quick access to some often used functions.

Playlist

The Playlist submenu allows you to view, save, search, reshuffle, and display the play time of the current playlist. These and other operations are detailed in section 4.4 (page 31). To change settings for the Playlist Viewer press Long **Right** while viewing the current playlist to bring up the Playlist Viewer Menu. In this menu, you can find the Playlist Viewer Settings.

Playlist Viewer Settings

Show Icons. This toggles display of the icon for the currently selected playlist entry and the icon for moving a playlist entry

Show Indices. This toggles display of the line numbering for the playlist

Track Display. This toggles between filename only and full path for playlist entries

Playlist catalogue

View catalogue. This lists all playlists that are part of the Playlist catalogue. You can load a new playlist directly from this list.

Add to playlist. Adds the currently playing file to a playlist. Select the playlist you want the file to be added to and it will get appended to that playlist.

Add to new playlist. Similar to the previous entry this will add the currently playing track to a playlist. You need to enter a name for the new playlist first.

Sound Settings

This is a shortcut to the Sound Settings Menu, where you can configure volume, bass, treble, and other settings affecting the sound of your music. See section 6 (page 41) for more information.

Playback Settings

This is a shortcut to the Playback Settings Menu, where you can configure shuffle, repeat, party mode, skip length and other settings affecting the playback of your music.

Rating

The menu entry is only shown if Gather Runtime Information is enabled. It allows the assignment of a personal rating value (0 – 10) to a track which can be displayed in the WPS and used in the Database browser. The value wraps at 10.

Bookmarks

This allows you to create a bookmark in the currently-playing track.

Show Track Info

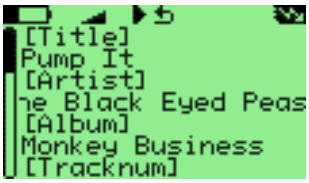

Figure 4.4.: The track info viewer

This screen is accessible from the WPS screen, and provides a detailed view of all the identity information about the current track. This info is known as meta data and is stored in audio file formats to keep information on artist, album etc. To access this

screen, press Long **Mode** to access the WPS Context Menu and select Show Track Info. Use **Left** and **Right** to move through the information.

Open With...

This Open With function is the same as the Open With function in the file browser's Context Menu.

Delete

Delete the currently playing file. The file will be deleted but the playback of the file will not stop immediately. Instead, the part of the file that has already been buffered (i.e. read into the player's memory) will be played. This may even be the whole track.

Pitch

The Pitch Screen allows you to change the rate of playback (i.e. the playback speed and at the same time the pitch) of your player. The rate value can be adjusted between 50% and 200%. 50% means half the normal playback speed and a pitch that is an octave lower than the normal pitch. 200% means double playback speed and a pitch that is an octave higher than the normal pitch.

The rate can be changed in two modes: procentual and semitone. Initially, procentual mode is active.

The value of the rate is not persistent, i.e. after the player is turned on it will always be set to 100%.

Key	Action
Long **Mode**	Toggle pitch changing mode.
Up / **Down**	Increase / Decrease pitch by 0.1% (in procentual mode) or by 0.1 semitone (in semitone mode).
Long **Up** / Long **Down**	Increase / Decrease pitch by 1% (in procentual mode) or a semitone (in semitone mode).
Left / **Right**	Temporarily change pitch by 2% (beat-match).
Mode	Reset rate to 100%.
On/Off	Leave the Pitch Screen.

Warning: Changing the pitch can cause audible 'Artifacts' or 'Dropouts'.

4.4. Working with Playlists

4.4.1. Playlist terminology

Some common terms that are used in Rockbox when referring to playlists:

Directory. A playlist! One of the keys to getting the most out of Rockbox is understanding that Rockbox *always* considers the song that it is playing to be part of a playlist, and in some situations, Rockbox will create a playlist automatically. For example, if you are playing the contents of a directory, Rockbox will automatically create a playlist containing all songs in it. This means that just about anything that is described in this chapter with respect to playlists also applies to directories.

Dynamic playlist. A dynamic playlist is a playlist that is created "On the fly." Any time you insert or queue tracks using the Playlist submenu (see section 4.4.3 (page 32)), you are creating (or adding to) a dynamic playlist.

Insert. In Rockbox, to Insert an item into a playlist means putting an item into a playlist and leaving it there, even after it is played. As you will see later in this chapter, Rockbox can Insert into a playlist in several places.

Queue. In Rockbox, to Queue a song means to put the song into a playlist and then to remove the song from the playlist once it has been played. The only difference between Insert and Queue is that the Queue option removes the song from the playlist once it has been played, and the Insert option does not.

4.4.2. Creating playlists

Rockbox can create playlists in four different ways.

By selecting ("playing") a song from the File Browser

Whenever a song is selected from the File Browser with **Right**, Rockbox will automatically create a playlist containing all of the songs in that directory and start playback with the selected song.

Note: If you already have created a dynamic playlist, playing a new song will *erase* the current dynamic playlist and create a new one. If you want to add a song to the current playlist rather than erasing the current playlist, see the section below on how to add music to a playlist.

By using Insert and Queue functions

If playback is stopped, the Insert and Queue functions can be used as described in 4.4.3 to create a new playlist instead of adding to an existing one. This will *erase* any dynamic playlist.

By using the Playlist catalogue

The Playlist catalogue makes it possible to modify and create playlists that are not currently playing. To do this select Playlist catalogue in the Context Menu. There you will have two choices, Add to playlist adds the selected track or directory to an existing playlist and Add to a new playlist creates a new playlist containing the selected track or directory.

Note: All playlists in the Playlist catalogue are stored by default in the `/Playlists` directory in the root of your player's disk and playlists stored in other locations are not included in the catalogue. It is however possible to move existing playlists there (see section 4.1.2 (page 21)).

By using the Main Menu

To create a playlist containing all music on your player, you can use the Create Playlist command in the Playlists menu found in the Main Menu. The created playlist will be named `root.m3u8` and saved in the root of your player's disk.

4.4.3. Adding music to playlists

Adding music to a dynamic playlist

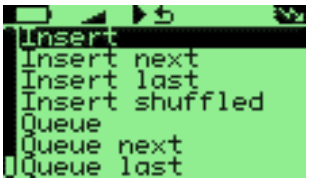

Figure 4.5.: The Playlist Submenu

The Playlist Submenu is a submenu in the Context Menu (see section 4.1.2 (page 21)), it allows you to put tracks into a "dynamic playlist". If there is no music currently playing, Rockbox will create a new dynamic playlist and put the selected track(s) into it. If there is music currently playing, Rockbox will put the selected track(s) into the current playlist. The place in which the newly selected tracks are added to the playlist is determined by the following options:

Insert. Add track(s) immediately after any tracks added via the most recent Insert operation. If no tracks have yet been added via an Insert, new tracks will be added immediately after the current playing track. If playback is stopped a new dynamic playlist will get created with the selected tracks.

Insert Next. Add track(s) immediately after current playing track, no matter what else has been inserted.

Insert Last. Add track(s) to end of playlist.

Insert Shuffled. Add track(s) to the playlist in a random order.

Insert Last Shuffled. Add tracks in a random order to the end of the playlist.

Queue. Queue is the same as Insert except queued tracks are deleted immediately from the playlist after they have been played. Also, queued tracks are not saved to the playlist file (see section 5.8 (page 38)).

Queue Next. Queue track(s) immediately after current playing track.

Queue Last. Queue track(s) at end of playlist.

Queue Shuffled. Queue track(s) in a random order.

Queue Last Shuffled. Queue tracks in a random order at the end of the playlist.

Play Next. Replaces all but the current playing track with track(s). Current playing track is queued.

The Playlist Submenu can be used to add either single tracks or entire directories to a playlist. If the Playlist Submenu is invoked on a single track, it will put only that track into the playlist. On the other hand, if the Playlist Submenu is invoked on a directory, Rockbox adds all of the tracks in that directory to the playlist.

Note: You can control whether or not Rockbox includes the contents of subdirectories when adding an entire directory to a playlist. Set the Settings → General Settings → Playlist → Recursively Insert Directories setting to Yes if you would like Rockbox to include tracks in subdirectories as well as tracks in the currently-selected directory.

Dynamic playlists are saved so resume will restore them exactly as they were before shutdown.

Note: To view, save, reshuffle, or display the play time of the current dynamic playlist use the Playlist sub menu in the WPS context menu or in the Main Menu.

4.4.4. Modifying playlists

Reshuffling

Reshuffling the current playlist is easily done from the Playlist sub menu in the WPS, just select Reshuffle.

Moving and removing tracks

To move or remove a track from the current playlist enter the Playlist Viewer by selecting View Current Playlist in the Playlist submenu in the WPS context menu or the Main Menu. Once in the Playlist Viewer open the context menu on the track you want to move or remove. If you want to move the track, select Move in the context menu and then move the blinking cursor to the place where you want the track to be moved and confirm with **Right**. To remove a track, simply select Remove in the context menu.

4.4.5. Saving playlists

To save the current playlist either enter the Playlist submenu in the WPS Context Menu (see section 4.3.3 (page 28)) and select Save Current Playlist or enter the Playlist Options menu in the Main Menu and select Save Current Playlist. Either method will bring you to the Virtual Keyboard (see section 4.1.3 (page 23)), enter a filename for your playlist and accept it and you are done.

4.4.6. Loading saved playlists

Through the File Browser

Playlist files, like regular music tracks, can be selected through the File Browser. When loading a playlist from disk it will replace the current dynamic playlist.

Through the Playlist catalogue

The Playlist catalogue offers a shortcut to all playlists in your player's specified playlist directory. It can be used like the File Browser.

5. The Main Menu

5.1. Introducing the Main Menu

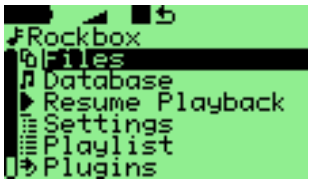

Figure 5.1.: The main menu

The Main Menu is the screen from which all of the Rockbox functions can be accessed. This is the first screen you will see when starting Rockbox. To return to the Main Menu, hold the **Mode** button.

All settings are stored on the unit. However, Rockbox does not access the flash storage solely for the purpose of saving settings. Instead, Rockbox will save settings when it accesses the flash storage the next time, for example when refilling the music buffer or navigating through the File Browser. Changes to settings may therefore not be saved unless the player is shut down safely (see section 3.1.2 (page 17)).

5.2. Navigating the Main Menu

Key	Action
Down	Select the next option in the menu. Inside a setting, increase the value or choose next option.
Up	Select the previous option in the menu. Inside a setting,decrease the value or choose previous option.
Right	Select option.
Left or **On/Off**	Exit menu or setting, or move to parent menu.

5.3. Recent Bookmarks

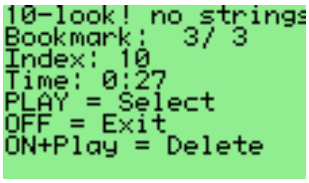

Figure 5.2.: The list bookmarks screen

If the Save a list of recently created bookmarks option is enabled then you can view a list of several recent bookmarks here and select one to jump straight to that track.

Note: Bookmarking only works when tracks are launched from the file browser, and does not currently work for tracks launched via the database. In addition, they do not currently work with dynamic playlists.

Key	Action
Down	Select the next bookmark.
Up	Select the previous bookmark.
Right	Resume from the selected bookmark.
Left or **On/Off**	Exit Recent Bookmark menu.
Long **Left**	Delete the currently selected bookmark.
Long **Right**	Enter the context menu for the selected bookmark.

There are two options in the context menu:

Resume will commence playback of the currently selected bookmark entry.
Delete will remove the currently selected bookmark entry from the list.

This entry is not shown in the Main Menu when the option is off (the default setting). See section 8.7 (page 55) for more details on configuring bookmarking in Rockbox.

5.4. Files

Browse the files on your player (see section 4.1 (page 20)).

5.5. Database

Browse by the meta-data in your audio files (see section 4.2 (page 24)).

5.6. Now Playing/Resume Playback

Go to the While Playing Screen and resume if music playback is stopped or paused and there is something to resume (see section 4.3 (page 26)).

5.7. Settings

The Settings menu allows you to set or adjust many parameters that affect the way your player works. There are many submenus for different parameter areas. Every time you are setting a value of a parameter, and that value is selected from a list of some predefined available values, you can press Long **Right**, and the selection cursor will jump to the default value for the parameter. You can then confirm or cancel the value. This is useful if you have changed the value of the parameter from the default to some other value and would like to restore the default value.

5.7.1. Sound Settings

The Sound Settings menu offers a selection of sound properties you may change to customise your listening experience. The details of this menu are covered in section 6 (page 41).

5.7.2. Playback Settings

The Playback Settings menu allows you to configure settings related to audio playback. The details of this menu are covered in section 7 (page 45).

5.7.3. General Settings

The General Settings menu allows you to customise the way Rockbox looks and the way it plays music. The details of this menu are covered in section 8 (page 49).

5.7.4. Theme Settings

The Theme Settings menu contains options that control the visual appearance of Rockbox. The details of this menu are covered in section 9 (page 60).

5.7.5. Manage Settings

The Manage Settings option allows the saving and re-loading of user configuration settings, browsing the hard drive for alternate firmwares, and finally resetting your

player back to initial configuration. The details of this menu are covered in section 11.3 (page 137).

5.8. Playlists

This menu allows you to work with playlists. Playlists can be created in three ways. Playing a file in a directory causes all the files in it to be placed in a playlist. Playlists can be created manually by either using the Context Menu (see section 4.1.2 (page 21)) or using the Playlist menu. Both automatically and manually created playlists can be edited using this menu.

Create Playlist: Rockbox will create a playlist with all tracks in the current directory and all sub-directories. The playlist will be created one directory level "up" from where you currently are.

View Current Playlist: Displays the contents of the playlist currently stored in memory.

Save Current Playlist: Saves the current dynamic playlist, excluding queued tracks, to the specified file. If no path is provided then playlist is saved to the current directory.

View Catalogue: Provides a simple interface to maintain several playlists (see section 4.4 (page 31)).

5.9. Plugins

With this option you can load and run various plugins that have been written for Rockbox. There are a wide variety of these supplied with Rockbox, including several games, some impressive demos and a number of utilities. A detailed description of the different plugins is to be found in section 10 (page 62).

5.10. System

Rockbox Info: Displays some basic system information. This is, from top to bottom, the amount of memory Rockbox has available for storing music (the buffer). The battery status. Memory size and amount of free space on the two data volumes, this info is given separately for internal memory (*Int*) and for a plugged in memory card (*MMC*) .

Credits: Display the list of contributors.

Running Time: Shows the runtime of your player in hours, minutes and seconds.

Running Time: This item shows the cumulative overall runtime of your player since you either disconnected it from charging (in Rockbox) or manually reset this item. A manual reset is done through pressing any button, followed by pressing **Right**.

Top Time: This item shows the cumulative overall runtime of your player since you last manually reset this item. A manual reset is done through pressing any button, followed by pressing **Right**.

Debug (Keep Out!): This sub menu is intended to be used *only* by Rockbox developers. It shows hardware, disk, battery status and other technical information.

Warning: It is not recommended that users access this menu unless instructed to do so in the course of fixing a problem with Rockbox. If you think you have messed up your settings by use of this menu please try to reset *all* settings before asking for help.

5.11. Shortcuts

This menu item is a container for user defined shortcuts to files, folders or settings. With a shortcut,

- A file can be "run" (i.e. a music file played, plugin started or a `.cfg` loaded)
- The file browser can be opened with the cursor positioned at a specified file or folder
- A file's or folder's "Current Playlist" context menu item can be displayed
- A setting can be configured (any which can be added to the Quick Screen)
- A debug menu item can be displayed (useful for developers mostly)
- The sleep timer can be configured
- The player can be turned off

Note: Shortcuts into the database are not possible

Shortcuts are loaded from the file `/.rockbox/shortcuts.txt` which lists each item to be displayed. Each shortcut looks like the following:

Example

```
[shortcut]
type: <shortcut type>
data: <what the shortcut actually links to>
name: <what the shortcut should be displayed as>
icon: <number of the theme icon to use (see ☞CustomIcons)>
talkclip: <filename of a talk clip to speak when voice menus are enabled>
```

Only "type" and "data" are required (except if type is "separator" in which case "data" is also not required).

Available types are:

file `data` is the name of the file to "run"

browse `data` is the file or the folder to open the file browser at

playlist menu `data` is the file or the folder to open the "Current Playlist" context menu item on

setting `data` is the config name of the setting you want to change (see section D (page 161) for the list of the possible settings)

debug `data` is the name of the debug menu item to display

separator `data` is ignored; `name` can be used to display text, or left blank to make the list more accessible with visual gaps

time `data` needs to be "sleep X" where X is the number of minutes to run the sleep timer for (0 to disable). `name` is required for this shortcut type.

shutdown `data` is ignored; `name` can be used to display text

If the name/icon items are not specified, a sensible default will be used.

Note: For the "browse" type, if you want the file browser to start *inside* a folder, make sure the data has the trailing slash (i.e `/Music/` instead of `/Music`). Without the trailing slash, it will cause the file browser to open with `/Music` selected instead.

The file `shortcuts.txt` can be edited with any text editor. Most items can also be added to it through their context menu item "Add to shortcuts". A reboot is needed for manual changes to `shortcuts.txt` to be applied.

Shortcuts can be manually removed by selecting the one you wish to remove and pressing Long **Right**.

6. Sound Settings

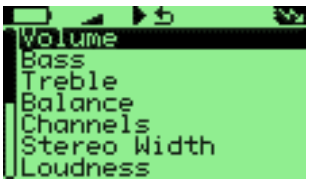

Figure 6.1.: The sound settings screen

The sound settings menu offers a selection of sound settings you may change to customise your listening experience.

6.1. Volume

This setting adjusts the volume of your music. Like most professional audio gear and many consumer audio products, Rockbox uses a decibel scale where 0 dB is a reference that indicates the maximum volume that the player can produce without possible distortion (clipping). All values lower than this reference will be negative and yield a progressively softer volume. Values higher than 0 dB are available and can be used to raise the volume more than would otherwise be possible. These volume levels will ordinarily lead to distorted sound, but might work nicely for music that has an otherwise low volume level. The volume can be adjusted from a minimum of -100 dB to a maximum of +12 dB.

6.2. Bass

This setting emphasises or suppresses the lower (bass) frequencies in the sound. A value of 0 dB means that bass sounds are unaltered (flat response). The minimum setting is -12 dB and the maximum is 12 dB.

6.3. Volume Limit

This setting adjusts the maximum volume of your music. The setting is by default set to the maximum volume which equals to no limit. To set a volume limit, select a volume

from the list and the maximum volume will be limited to the selected value all over the system.

6.4. Treble

This setting emphasises or suppresses the higher (treble) frequencies in the sound. A value of 0 dB means that treble sounds are unaltered (flat response). The minimum setting is -12 dB and the maximum is 12 dB.

6.5. Balance

This setting controls the balance between the left and right channels. The default, 0, means that the left and right outputs are equal in volume. Negative numbers increase the volume of the left channel relative to the right, positive numbers increase the volume of the right channel relative to the left.

6.6. Channels

A stereo audio signal consists of two channels, left and right. The Channels setting determines if these channels are to be combined in any way, and if so, in what manner they will be combined. Available options are:

Stereo. Leave the audio signal unmodified.

Mono. Combine both channels and send the resulting signal to both stereo channels, resulting in a monophonic output.

Custom. Allows you to manually specify a stereo width with the Stereo Width setting described later in this chapter.

Mono Left. Plays the left channel in both stereo channels.

Mono Right. Plays the right channel in both stereo channels.

Karaoke. Removes all sound that is common to both channels. Since most music is recorded with vocals being equally present in both channels to make the singer sound centrally placed, this often (but not always) has the effect of removing the voice track from a song. This setting also very often has other undesirable effects on the sound.

6.7. Stereo Width

Stereo width allows you to manually specify the effect that is applied when the Channels setting is set to "custom". All values below 100% will progressively mix the contents

of one channel into the other. This has the effect of gradually centering the stereo image, until you have monophonic sound at 0%. Values above 100% will progressively remove components in one channel that is also present in the other. This has the effect of widening the stereo field. A value of 100% will leave the stereo field unaltered.

6.8. Loudness

When listening at low volumes, the ear will tend to make bass and treble frequencies sound quieter than they really are. To compensate for this, Loudness is an effect which emphasises bass and treble in a fashion suited to the human ear. Frequencies in the vocal range are unaffected, since the human ear picks these up very easily at any sound level. It is of course also possible to use this effect at higher volumes for enhanced bass and treble.

6.9. Auto Volume

Auto volume is a feature that automatically lowers the volume on loud parts, and then slowly restores the volume to the previous level over a time interval. This setting allows this time interval to be configured. Short values like 20 ms are useful for ensuring a constant volume for in-car use and other applications where background noise makes a constant loudness desirable. A longer timeout means that the change in volume back to the previous level will be smoother, so there will be fewer sharp changes in volume level.

6.10. Super Bass

This setting changes the threshold at which bass frequencies are affected by the Loudness setting, making the sound of drums and bass guitar louder in comparison to the rest of the sound. This setting only has an effect if Loudness is set to a value larger than 0 dB.

6.11. MDB – Micronas Dynamic Bass

The rest of the parameters in this menu relate to the Micronas Dynamic Bass (MDB) function. MDB is designed to enable the user to hear bass notes that the headphones and/or speakers are not capable of reproducing. Every tone has a fundamental frequency (the “main tone”) and also several harmonics, which are related to that tone. The human brain has a mechanism whereby it can actually infer the presence of bass notes from the higher harmonics that they would generate.

The practical upshot of this is that MDB produces a more authentic sounding bass by tricking the brain into believing it is hearing tones that the headphones or speakers are not capable of reproducing.

The MDB parameters are as follows:

MDB enable. This turns the MDB feature on or off. For many users this will be the only setting they need, since Rockbox picks sensible defaults for the other parameters. MDB is turned off by default.

MDB strength. How loud the harmonics generated by MDB will be.

MDB Harmonics. The percentage of the low notes that is converted into harmonics. If low notes are causing speaker distortion, this can be set to 100% to eliminate the fundamental completely and only produce harmonics in the signal. If set to 0% this is the same as turning the MDB feature off.

MDB Centre Frequency. The cutoff frequency of your headphones or speakers. This is usually given in the specification for the headphones/speakers.

MDB shape. It is recommended that this parameter be set to 1.5 times the centre frequency.

This is the frequency up to which harmonics are generated. Some of the lower fundamentals near the cut-off range will have their lower harmonics cut, since they will be below the range of the speakers. Fundamentals between the cut-off frequency and the lower frequency will have their harmonics proportionally boosted to compensate and restore the 'loudness' of these notes.

For most users, the defaults should provide an improvement in sound quality and can be safely left as they are. For reference, the defaults Rockbox uses are:

Setting	Value
MDB Strength	50 dB
MDB Harmonics	48%
MDB Centre Frequency	60 Hz
MDB Shape	90 Hz

7. Playback Settings

The Playback Settings menu allows you to configure settings related to audio playback.

7.1. Shuffle

Turning shuffle on will cause Rockbox to randomly re-order the playlist. Thus, to shuffle all of the audio files on the player, you first need to create a playlist containing all of them. For more information on creating playlists refer to section 4.4 (page 31).
Options: Yes/No.

7.2. Repeat

Configures settings related to repeating of directories or playlists.
Options: Off / All / One / Shuffle / A-B:

Off. The current playlist will not repeat when it is finished.

> **Note:** If you have the Auto-Change Directory option set to Yes, Rockbox will move on to the next directory on your hard drive. If the Auto-Change Directory option is set to No, playback will stop when the current directory or playlist is finished.

All. The current playlist will repeat when it is finished.

One. Repeat one track over and over.

Shuffle. When the current playlist has finished playing, it will be shuffled and then repeated.

A-B. Repeats between two user defined points within a track, typically used by musicians when attempting to learn a piece of music. This option is more complicated to use than the others as the player must first be placed into A-B repeat mode and then the start and end points defined.

To set the Start Point (A) press **Mode**. The following press of **Mode** will set the End Point (B), and a third successive **Mode** will reset the markers.

7.3. Play Selected First

This setting controls what happens when you select a file for playback while shuffle mode is on. If the Play Selected First setting is Yes, the file you selected will be played first. If this setting is No, a random file in the directory will be played first.

7.4. Fast-Forward/Rewind

These settings control the speed and acceleration during fast forward and rewind. The setting FF/RW Min Step controls the initial speed and FF/RW Accel controls the acceleration.

7.5. Fade on Stop/Pause

Enables and disables a fade effect when you pause or stop playing a song. If the Fade on Stop/Pause option is set to Yes, your music will fade out when you stop or pause playback, and fade in when you resume playback.

7.6. Party Mode

Enables unstoppable music playback. When new songs are selected, they are queued at the end of the current dynamic playlist instead of being played immediately. Pausing and stopping playback is disabled as well as skipping songs and launching plugins.

7.7. Auto-Change Directory

Control what Rockbox does when it reaches the end of a directory. If Auto-Change Directory is set to Yes, Rockbox will continue to the next directory. If Auto-Change Directory is set to No, playback will stop at the end of the current playlist. Using the Random feature requires you to first generate a folder list via the Random Folder Advance Configuration plugin (see section 10.4.14 (page 123)).

Note: You must have the Repeat option set to No for Auto-Change Directory to function properly.

Note: This feature only works when songs have been played from the file browser. Using it with the database may cause unexpected behaviour.

7.8. Constrain Auto-Change

If enabled and you have set Start File Browser Here to a directory other than root, Auto-Change Directory will be constrained to the directory you have chosen and those below it. See section 4.1.2 (page 22).

7.9. Last.fm Log

Enables logging of your played tracks for submission to http://www.last.fm. This service was formerly known as *Audioscrobbler*. When you enable this option, you'll have to reboot to start the logging. The log-file is called `.scrobbler-timeless.log`,and is to be found in the root directory of your player.

Note: See ☞LastFMLog for a further description, and for tools you can use to submit your Last.fm log.

7.10. Cuesheet Support

Enables reading of cuesheet files for played tracks. If a cuesheet is found for a track, track markers are displayed on the progressbar and it is possible to skip between the tracks within the cuesheet. Also the information found in the cuesheet file will replace the information from the ID3 tags. When you enable this option, you'll have to reboot for it to come into effect.

Cuesheet files should have the same file name as the audio file they reference, except with the extension `.cue`. This file can either reside in the same directory as the audio file (checked first), or within the `.rockbox/cue` directory.

The contents of a cuesheet file can also be embedded within the metadata of an audio file. There is currently support for the FLAC tag/ Vorbis comment *CUESHEET* or the ID3v2 *TXXX CUESHEET* tag.

7.11. Skip Length

Designed to speed up navigation when listening to long audio tracks, Skip Length changes the behaviour of the **Left** and **Right** buttons so that they skip by a given time instead of skipping to a new track. The Skip to Outro option changes the behaviour so that the buttons skip to just before the end of the track, so that the last few seconds are played before the next track.

7.12. Prevent Track Skipping

If this option is enabled, the ability to manually skip tracks is disabled in order to avoid accidental track skips. It does not prevent changing tracks if a track ends, which can be

achieved by combining this option with Repeat set to One

7.13. Rewind on Pause

This option rewinds the current track by a small amount whenever it is paused (not stopped). The amount to rewind can be set between 0 and 15 seconds.

8. General Settings

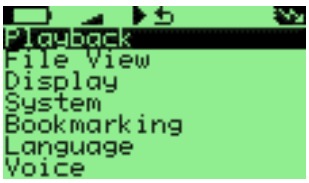

Figure 8.1.: The general settings screen

8.1. Playlist

The Playlist sub menu allows you to configure settings related to playlists.

Recursively Insert Directories. If set to On, then when a directory is inserted or queued into a dynamic playlist, all subdirectories will also be inserted. If set to Ask, Rockbox will prompt the user about whether to include sub-directories.

Warn When Erasing Dynamic Playlist. If set to Yes, Rockbox will provide a warning if the user attempts to take an action that will cause Rockbox to erase the current dynamic playlist.

8.2. File View

The File View menu deals with options relating to how the File Browser displays files.

Sort Case Sensitive. If this option is set to Yes, all files that start with upper case letters will be listed first, followed by all files that begin with lower case letters. If this option is set to NO, then case will be ignored when sorting files.

Sort Directories. This option controls how Rockbox sorts directories. The default is to sort them alphabetically. By date sorts them with the oldest directory first. By newest date sorts them with the newest directory first.

Sort Files. This option controls how Rockbox sorts files. All of the options for Sort Directories are available in this option. In addition, there is a By type option which sorts files alphabetically by their type (such as `.mp3`) then alphabetically within each type.

Interpret numbers when sorting. As whole numbers enables a sorting algorithm which is similar to the default sorting of, for example, Windows Explorer, Mac OS X's Finder or Nautilus, with regards to numbers at the beginning or within filenames. It combines consecutive digits to a number used for sorting, taking leading zeros into account.
As digits disables this algorithm, and causes every digit to be compared separately. The following table demonstrates the two sorting methods.

As whole numbers	As digits
03 Jackson.mp3	03 Jackson.mp3
1 Ring Of Fire.mp3	1 Ring Of Fire.mp3
2 I Walk The Line.mp3	10 A Thing Called Love.mp3
10 A Thing Called Love.mp3	2 I Walk The Line.mp3
Episode 1.ogg	Episode 1.ogg
Episode 57.ogg	Episode 233.ogg
Episode 233.ogg	Episode 57.ogg

Show Files. This option controls which files are displayed in the File Browser.

All. The File Browser displays all files and directories. Extensions are shown. No files or directories are hidden.

Supported. The File Browser displays all directories and files supported by Rockbox (see section A.1 (page 144)). Files and directories starting with . (*dot*) or with the *hidden* flag set are hidden.

Music. The File Browser displays only directories, playlists and the supported *audio* file formats. Extensions are stripped. Files and directories starting with . or with the "hidden" flag set are hidden.

Playlists. The File Browser displays only directories and playlists, for simplified navigation.

Show Filename Extensions. This option controls how file extensions are shown in the File Browser.

Off. The file extensions are never shown.

On. The file extensions are always shown.

Only unknown types. Only the extensions of unknown filetypes are shown.

Only when viewing all types. Only show file extensions when Show Files is set to All.

Follow Playlist. This option determines what directory the File Browser displays first. If Follow Playlist is set to Yes, when you enter the File Browser from the WPS, you will find yourself in the same directory as the currently playing file.

If Follow Playlist is set to No, when you enter the File Browser from the WPS, you will find yourself in the directory you were in when you last left the File Browser.

Show Path. If this setting is set to Full Path the full path to the current directory will be displayed on the first line in the File Browser. If set to Current Directory Only only the name of the current directory will be displayed.

This has a similar effect on the Database browser. If set to Current Directory Only or Full Path, then the title of each menu will be displayed on the first line in the Database Browser.

8.3. Database

This sub menu allows you to configure the database. See section 4.2 (page 24) for more information about using the database.

8.4. Display

LCD Settings. This sub menu contains settings that relate to the display of the player.

Contrast. Changes the contrast of your LCD display.

Warning: Setting the contrast too dark or too light can make it hard to find this menu option again!

LCD Mode. This setting lets you invert the colours of the display.

Upside Down. Displays the screen so that the top of the display is nearest the buttons. This is sometimes useful when carrying the player in a pocket for easy access to the headphone socket.

Scrolling. This feature controls how text will scroll in Rockbox. You can configure the following parameters:

Scroll Speed. Sets how many times per second the automatic horizontal scrolling text will move a step.

Scroll Start Delay. Controls how many milliseconds Rockbox should wait before a new text begins automatically scrolling.

Scroll Step Size. Defines the number of pixels the text should move for each step, as used by the Scroll Speed setting.

Bidirectional Scroll Limit. Rockbox has two different automatic horizontal scrolling methods: 1) always scrolling the text to the left until the line has ended and then beginning again at the start, and 2) moving to the left until you can read the end of the line and then scrolling right until you see the beginning again. Rockbox chooses which method it should use depending of how much

it has to scroll to the left. This setting lets you tell Rockbox where that limit is, expressed in percentage of the line length.

Screen Scrolls Out of View. Screens can be manually scrolled horizontally by pressing **Mode+Right/Left**. Setting this option to Yes will keep the list entries at their fixed positions and allow them to be scrolled out of view, whereas No will only scroll those entries which surpass the right margin.

Screen Scroll Step Size. Defines the number of pixels the horizontal manual screen scroll should move for each step.

Paged Scrolling. When set to Yes scrolling vertically on pages that surpass the screen size will page up/down instead of simply changing lines. This can be useful on slow displays.

List Acceleration Start Delay. This setting enables the acceleration of scroll speed in lists when holding **Up** or **Down**. When set to Off the acceleration is disabled. When any other value is set the acceleration will start to accelerate after holding **Up** or **Down** for the chosen time (in seconds).

List Acceleration Speed. This setting controls how fast the scroll speed accelerates. The scroll speed will increase every N seconds. For example, selecting Speed up every 3s will increase the scroll speed every 3 seconds while **Up** or **Down** is held.

Peak Meter. The peak meter can be configured with a number of parameters.

Peak Release. This determines how fast the bar shrinks when the music becomes softer. Lower values make the peak meter look smoother. Expressed in scale units per 10 ms.

Peak Hold Time. Specifies the time after which the peak indicator will reset. For example, if you set this value to 5 s, the peak indicator displays the loudest volume value that occurred within the last 5 seconds. Larger values are useful if you want to find the peak level of a song, which might be of interest when copying music from the player via the analogue output to some other recording device.

Clip Hold Time. The number of seconds that the clipping indicator will be visible after clipping is detected.

Scale. Select whether the peak meter displays linear or logarithmic values. The human ear perceives loudness on a logarithmic scale. If the Scale setting is set to Logarithmic (dB) scale, the volume values are scaled logarithmically. The volume meters of digital audio devices usually are scaled this way. On the other hand, if you are interested in the power level that is applied to your headphones you should choose Linear display. This setting cannot be displayed in units like volts or watts because such units depend on your headphones.

Minimum and maximum range. These two options define the full value range that the peak meter displays. Recommended values for the Logarithmic (dB) setting are -40 dB for minimum and 0 dB for maximum. Recommended values for Linear display are 0 and 100%. Note that -40 dB is approximately 1% in linear value, but if you change the minimum setting in linear mode slightly and then change to the dB scale, there will be a large change. You can use these values for 'zooming' into the peak meter.

Default Codepage. A codepage describes the way extended characters that are not available within the ASCII character set are encoded. ID3v1 tags do not have a codepage encoding contained so Rockbox needs to know what encoding has been used when generating these tags. This should be "ISO-8859-1" but to support languages outside Western Europe most applications use the setting of your operating system instead. If your operating system uses a different codepage and you are getting garbled extended characters you should adjust this settings. In most cases sticking to "ISO-8859-1" would be sufficient.

8.5. System

8.5.1. Battery

Options relating to the batteries in the player.

Battery Capacity. This setting can be used to tell Rockbox what capacity (in mAh) the battery being used has. The default is 1000 mAh, which is the capacity value for the standard batteries shipped with the player. Rockbox uses this value for runtime estimation, not battery percentage calculation. Changing this setting has no effect whatsoever on actual battery life. This setting only affects the accuracy of the runtime estimation as shown on screen.

Battery Type. This setting tells Rockbox which type of battery is currently used in the player. The two supported battery types are "Alkaline" or "NiMH".

8.5.2. Limits

This sub menu relates to limits in the Rockbox operating system.

Max Entries in File Browser. This setting controls the limit on the number of files that you can see in any particular directory in the file browser. You can configure the size to be between 50 and 10,000 files in steps of 50. The default is 400. Higher values will shorten the music buffer, so you should increase this setting *only* if you have directories with a large number of files.

Max Playlist Size. This setting controls the maximum size of a playlist. The playlist size can be between 1,000 and 32,000 files, in steps of 1,000 (default is 10,000). Higher values will shorten the music buffer, so you should increase this setting *only* if you have very large playlists.

Glyphs To Cache. This sets the default memory allocation size for fonts in unique glyphs. This should be set to the number of unique language glyphs and punctuation marks that are frequently displayed. The default is 250.

Note: You will need to restart your player for changes to Max Entries in File Browser or Max Playlist Size to take effect while Glyphs To Cache will affect the next font load.

8.5.3. Advanced Key Lock

This option allows users to select actions that when within WPS or FMS will *not* be blocked by the key lock (software hold switch).

Enabled. Enables/disables the feature.

Settings. Allows to select actions that will *not* be blocked by the key lock.

Volume. Volume up/down.

Play. Toggling Play/Pause.

Seek. Seeking in a track.

Skip. Skipping of a track.

Disable Notify. Suppresses the notification 'Buttons Locked' (still will if power button is pressed).

Note: This is a pre-requisite for selectivebacklight section **??** (page **??**) to work also during key lock.

Selected actions are indicated by a leading +. Note: If all options get de-selected, the entire feature is disabled.

8.6. Startup/Shutdown

The Startup/Shutdown sub menu allows you to configure items which are run at startup, or initiate a shutdown when conditions are met.

8.6.1. Start Screen

Set the screen that Rockbox will start in. The default is the main menu but the following options are available:

Previous Screen. Start Rockbox in the same screen as when it was shut off.

Main Menu. Show the main menu.

Files. Display the file browser, starting in the root directory of your player.

Database. Show the default database view.

Resume Playback. Go to the WPS and and resume playback from where it was before turning off (if there is a playlist to resume).

Settings. Display the main settings menu.

Recent Bookmarks. Show the list of recent bookmarks as described in section 8.7 (page 55). Bookmarking needs to be enabled.

8.6.2. Idle Poweroff

Rockbox can be configured to turn off power after the unit has been idle for a defined number of minutes. The player is idle when playback is stopped or paused. It is not idle while the USB or charger is connected . Settings are either Off or 1 to 10 minutes in 1 minute steps. Then 15, 30, 45 or 60 minutes are available.

8.6.3. Sleep Timer

The Sleep Timer powers off your player after a given time, whether playing or not.

Start Sleep Timer (*duration*): Shown when the Sleep Timer is inactive, this option will initiate a Sleep Timer with the duration shown in brackets.

Cancel Sleep Timer (*remaining*): Shown when the Sleep Timer is active, this option will cancel the current Sleep Timer.
The time remaining before completion is shown in brackets.

Default Sleep Timer Duration: The default number of minutes a new Sleep Timer will run for.
The values range from 5 minutes to 5 hours in 5 minute steps.
If a timer is currently active, the timer's duration will be set to the newly entered value.
The value set is persistent, see section D (page 161).

Start Sleep Timer On Boot: If set, a Sleep Timer will be initiated when the device starts.

Restart Sleep Timer On Keypress: If set, when a Sleep Timer is active and a key is pressed, the Sleep Timer will be restarted with the initial duration.

8.7. Bookmarking

Bookmarks allow you to save your current position within a track so that you can return to it at a later time. Bookmarks are saved on a per directory basis or for individual (saved) playlists. You can store multiple bookmarks, even for the same track. When

there's already a bookmark for a directory or playlist, new bookmarks are added before existing ones.

Bookmarks are stored next to the directory or playlist they reference, in a file with the same name as the directory or playlist and a ".bmark" extension. To load a bookmark, select the bookmark file and then select the bookmark to load. There are other ways to load a bookmarks mentioned below.

Note: Bookmarking only works when tracks are launched from the file browser, and does not work for tracks launched via the database. In addition, they do not work with dynamic playlists.

Bookmark on Stop. This option controls whether Rockbox creates a bookmark when playback is stopped manually.

No. Do not create bookmarks.

Yes. Always create bookmarks.

Ask. Ask if a bookmark should be created.

Yes – Recent Only. Always create a bookmark, but only in the recent bookmarks list.

Ask – Recent Only. Ask if a bookmark should be created, but only add it to the recent bookmarks list.

When either Yes – Recent Only or Ask – Recent Only is selected, bookmarks are only created if the Maintain a List of Recent Bookmarks is enabled.

Note: The Resume function remembers your position in the most recently accessed track regardless of how the Bookmark on Stop option is set.

Update on Stop. If set to "No", this setting has no effect and does not affect any other settings. If set to "Yes", and the file to which a new bookmark would be added already exists, this option overrides the previous setting (Bookmark on Stop) and unconditionally creates a bookmark. This is useful if you don't generally want to create bookmarks but only want to add them to already existing bookmark files. In this case you should set the setting Bookmark on Stop to "No" and the setting Update on Stop to "Yes".

Load Last Bookmark. This option controls if Rockbox should automatically load a bookmark for a file, when that file is played.

No Always start from the beginning of the track or playlist.

Yes Automatically return to the position of the last bookmark. Start from the beginning if there are no bookmarks.

Ask Ask if playback should start from the beginning of the track or from one of the bookmarks.

Maintain a list of Recent Bookmarks. If this option is enabled, a list of the most recently created bookmarks may be accessed through the Recent Bookmarks option in the Main Menu. This list contains up to ten entries.

No Do not keep a list of recently used bookmarks. This also removes the Recent Bookmarks from the Main Menu.

Yes Keep a list of recently used bookmarks. Each new bookmark is added to the list of recent bookmarks.

One per playlist Add each new bookmark to the list of recently used bookmarks, but only keep one bookmark from the current directory or playlist; any previous entries for the playlist are removed.

One per track Add each new bookmark to the list of recently used bookmarks, but only keep one bookmark from the current directory or playlist and the current track; any previous entries for the track within the playlist are removed.

The following keys can be used to navigate in any bookmark list.

Key	Action
Down	Selects the next bookmark.
Up	Selects the previous bookmark.
Right	Resumes from the selected bookmark.
Left or **On/Off**	Exits Recent Bookmark menu
Long **Left**	Deletes the currently selected bookmark
Long **Right**	Enters the context menu for the selected bookmark.

There are two options in the context menu:

- Resume will commence playback of the currently selected bookmark entry.
- Delete will remove the currently selected bookmark entry from the list.

8.8. Language

This setting controls the language of the Rockbox user interface. Selecting a language will activate it. The language files must be in the `/.rockbox/langs/` directory. See section 11.1.4 (page 131) for further details about languages.

8.9. Voice

Voice Menus. This option controls the voicing of menus/settings as they are selected by the cursor. In order for this to work, a voice file must be present in the

`/.rockbox/langs/` directory on the player. Voice files are large and are not shipped with Rockbox by default. The voice file is the name of the language for which it is made, followed by the extension `.voice`. So for English, the file name would be `english.voice`. This option is on by default, but will do nothing unless the appropriate voice file is installed in the correct place on the player. The Voice Menus have several limitations:

- Setting the Sound Option Channels to Karaoke may disable voice menus.
- Plugins do not support voice features.

Voice Directories. This option controls voicing of directory names. A voice file must be present for this to work. Several options are available.

Spell. Speak the directory name by spelling it out letter by letter. Support is provided only for the most common letters, numbers and punctuation.

Numbers. Each directory is assigned a number based upon its position in the file list. They are then announced as "Directory 1", "Directory 2" etc.

Off. No attempt will be made to speak directory names.

You can use pre-generated .talk clips to have directory names spoken properly, but you must enable this explicitly (see below).

Use Directory .talk Clips. This option turns on the use of .talk clips for directories.

On. Use special pre-recorded files (`_dirname.talk`) in each directory. These must be generated in advance, and are typically produced synthetically using a text-to-speech engine on a PC.

Off. No checking is made for directory .talk clips; they are not used even if present. This can reduce disk activity.

Use of a .talk clip takes precedence over other directory name voicing. Otherwise (e.g. if a .talk clip is not available), voicing uses the method set under Voice Directories above.

Voice Filenames. This option controls voicing of filenames. Again, a voice file must be present for this to work. The options provided are Spell, Numbers, and Off which function the same as for Voice Directories. You can use pre-generated .talk clips to have filenames spoken properly, but you must enable this explicitly (see below).

Use File .talk Clips. This option turns on the use of .talk clips for files.

On. Use special pre-recorded files for each file. This functions the same as for directories except that the .talk clip file must have the same name as the described file with an extra .talk extension (e.g. `Punkadiddle.mp3` would require a file called `Punkadiddle.mp3.talk`).

Off. No checking is made for file .talk clips; they are not used even if present. This can reduce disk activity.

Use of a .talk clip takes precedence over other filename voicing. Otherwise (e.g. if a .talk clip is not available), voicing uses the method set under Voice Filenames above.

Say File Type. This option turns on voicing of file types when Voice Filenames is set to Spell or Numbers. When Voice Directories is set to Spell, "Directory" will be voiced after each spelled out directory.

Announce Battery Level. When this option is enabled the battery level is announced when it falls under 50%, 30% and 15%.

See ☞VoiceHowto for more details on configuring speech support in Rockbox.

9. Theme Settings

The Theme Settings menu offers options that you can change to customize the visual appearance of Rockbox.

Browse Theme Files. This option will display all the currently installed themes on the player, press **Right** to load the chosen theme and apply it.

A theme is a configuration file, stored in a specific directory, that typically changes the WPS , font used and on some platforms additional information such as background image and text colours.

There are a number of themes that ship with Rockbox. If none of these suit your needs, many more can be downloaded from http://themes.rockbox.org/index.php?target=ondiosp.

Note: Themes do not have to be purely visual. It is quite possible to create a theme that switches between audio configurations for use in the car, with headphones and when connected to an external amplifier. See section 11.2.2 (page 132) for more details.

Font. Browse the installed fonts on your player. Selecting one will activate it. See section 11.1.3 (page 130) for further details about fonts.

While Playing Screen. Opens the File Browser in the `/.rockbox/wps` directory and displays all `.wps` files. Selecting one will activate it, **Left** or **On/Off** will exit back to the menu. For further information about the WPS see section 4.3 (page 26). For information about editing a .wps file see section 11.2 (page 132).

Show Icons. Rockbox has the ability to display an icon to the left of the file in the File Browser. For details of these icons, see section A.1 (page 144). These icons can also be customised. See the ☞IconSets and ☞CustomIcons Wiki pages for details.

Status/Scrollbar. Settings related to on screen status display and the scrollbar.

Scroll Bar. Allows you to choose where the vertical scroll bar should appear.

Scroll Bar Width. Allows you to choose the width of the scroll bar (in pixels). Default value is 6.

Status Bar. Allows you to choose where to display the statusbar.

Volume Display. Controls whether the volume is displayed as a graphic or a numeric value on the Status Bar. If you select a numeric display, volume is displayed in decibels. See section 6.1 (page 41) for more on the volume setting.

Battery Display. Controls whether the battery charge status is displayed as a graphic or numerical percentage value on the Status Bar.

Line Selector Type. This option allows you to select which type of line selector to use.

Pointer. A small arrow to the left of the menu text.

Bar (inverse). A bar with inverted foreground and background colour.

10. Plugins

Plugins are programs that Rockbox can load and run. Only one plugin can be loaded at a time. Plugins have exclusive control over the user interface. This means you cannot switch back and forth between a plugin and Rockbox. When a plugin is loaded, you need to exit it to return to the Rockbox interface. Most plugins will not interfere with music playback but some of them will stop playback while running. Plugins have the file extension `.rock`. Most of them can be started from Browse Plugins in the Main Menu.

Viewer plugins get started automatically by opening an associated file (i.e. text files, chip8 games), or from the Open with option on the Context Menu.

10.1. Games

See also the Chip-8 emulator in section 10.3.2 (page 99), Frotz in section 10.3.3 (page 100), and ZXBox in section 10.3.14 (page 109).

10.1.1. 2048

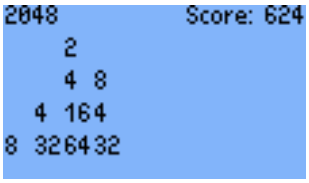

Figure 10.1.: 2048

2048 is a simple, addictive puzzle game played by moving tiles in around on a 4x4 grid. Tiles slide as far as possible in the direction chosen by the player each turn until they are stopped by either another tile or the edge of the grid. If two tiles of the same number collide while moving, they merge into a tile with the total value of the two tiles that collided. The resulting tile cannot merge with another the same move. After each move, a tile with the value of 2 or 4 is created in an empty spot on the grid.

The game is won when a tile with a value of 2048 is created, and the player loses when there are no more possible moves.

Note: On players with a small screen tiles with a value greater than 1000 are shortened

to “1k”, “2k” and so forth (*k* is the abbreviation of *kilo*, which – in computer talk – means a multiple of 1024).

Key	Action
Up, **Down**, **Left**, **Right**	Slide tiles
On/Off	Go to menu

10.1.2. Blackjack

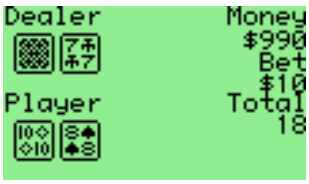

Figure 10.2.: Blackjack

Blackjack, a game played in casinos around the world, is now available in the palm of your hand! The rules are simple: try to get as close to 21 without going over or simply beat out the dealer for the best hand. Although this may not seem difficult, blackjack is a game renowned for the strategy involved. This version includes the ability to split, buy insurance, and double down.

For the full set of rules to the game, and other fascinating information visit http://www.blackjackinfo.com/blackjack-rules.php

Key	Action
Left / **Right** / **Up** / **Down**	Enter betting amount
Mode	Hit (Draw new card) / Select
Right	Stay (End hand)
Up	Double down
On/Off	Pause game and go to menu / Cancel

10.1.3. BrickMania

Figure 10.3.: BrickMania

BrickMania is a clone of the classic game Breakout. The aim of the game is to destroy all the bricks by hitting them with the ball once or more. Sometimes a special item falls down when you destroy a brick. For a special item to take effect, you must catch it with the paddle. Look out for the bad ones.

Special items

Displayed	Name	Description
N	Normal	Returns paddle to normal.
D	Die	Ball dies; lose a life.
L	Life	Gain a life.
F	Fire	Allows you to shoot bricks with paddle.
G	Glue	Ball sticks to paddle each time it hits.
B	Ball	Immediately fires another ball.
FL	Flip	Flip left / right movement.

Key	Action
Left / Right	Moves the paddle
Mode / Up	Release the ball / Fire
On/Off	Open menu / Quit

10.1.4. Bubbles

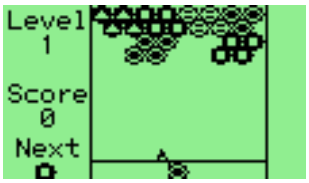

Figure 10.4.: Bubbles

The goal of the game is to beat each level as quickly as possible by clearing the board of all bubbles. Bubbles are removed from the board when a cluster of three of more of the same type is formed. The game is over when any bubbles on the board extend below the bottom line. To make things more difficult, the entire board is shifted down every time a certain number of shots have been fired. Points are awarded depending on how quickly the level was completed.

Key	Action
Mode	Pause game
Left / **Right**	Aim the bubble
Up	Fire bubble
On/Off or Long **On/Off**	Exit to menu

10.1.5. Chessbox

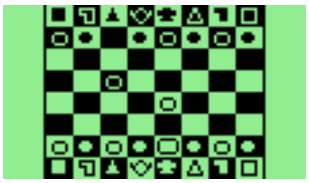

Figure 10.5.: Chessbox

Chessbox is a one-person chess game with computer artificial intelligence. The chess engine is a port of GNU Chess 2 by John Stanback.

It also works as a PGN file viewer. Instead of executing the game from the plugin menu, look for any file with `.pgn` extension in the file browser and execute it. Chessbox will show the list of matches included in the file and allow you to select the one you want

to watch. After that, you can scroll back and forth through the moves of the game. If the menu is invoked while in the viewer, the user is allowed to select a new match from the same file or quit the game.

"Force play" while the computer is thinking will cause it to make its move immediately. If done while it's your turn, the computer will move for you and flip the board so that you are playing from the other side. If you want, you can force play an entire game and watch the artificial intelligence fight against itself.

When you quit the game the current state will be saved and restored when you resume the game. The menu also allows the user to reload the last game saved, save the current position and start a new game without having to quit the game.

Note: This plugin will stop playback.

Keys

Key	Action
Direction keys	Move the cursor
Mode	Pick up / Drop piece
Mode+On/Off	Change level
Long **Mode**	Force play
On/Off	Show the menu

10.1.6. Chopper

Figure 10.6.: Chopper

Navigate a cavernous maze without banging into walls, the ceiling, or the floor. How long can you fly your chopper?

Key	Action
Up / Mode	Make chopper fly
On/Off	Enter menu

10.1.7. Dice

Dice is a simple dice rolling simulator. Select number and type of dice to roll in a menu and start by choosing "Roll Dice". The result is shown as individual numbers as well as the total of the rolled dice.

Key	Action
Mode	Roll dice again
On/Off	Quit

10.1.8. Flipit

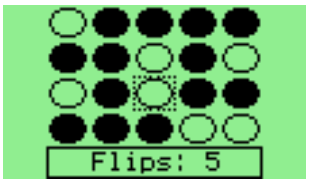

Figure 10.7.: Flipit

Flipping the colour of the token under the cursor also flips the tokens above, below, left and right of the cursor. The aim is to end up with a screen containing tokens of only one colour.

Key	Action
Up / **Down** / **Left** / **Right**	Move the cursor
Mode	Flip
Mode+Left	Shuffle
Mode+Up	Solve
Mode+Right	Solve step by step
On/Off	Quit the game

10.1.9. Goban

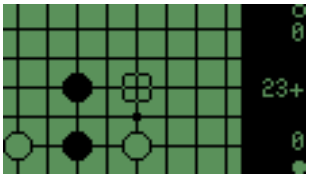

Figure 10.8.: Goban

Goban is a a plugin for playing, viewing and recording games of Go (also known as Weiqi, Baduk, Igo and Goe). It uses standard Smart Game Format (SGF) files for saving and loading games. You can find a short introduction to Go at http://senseis.xmp.net/?WhatIsGo and more information about SGF files can be read at http://senseis.xmp.net/?SmartGameFormat or the SGF specification at http://www.red-bean.com/sgf/.

This plugin can load all modern SGF files (file format 3 or 4) with few problems. It attempts to preserve SGF properties which it doesn't understand, and most common SGF properties are handled fully. It is possible to view (and edit if you like) Kogo's Joseki Dictionary (http://waterfire.us/joseki.htm) with this plugin, although the load and save times can be on the order of a minute or two on particularly slow devices. Large SGF files may stop audio playback for the duration of the plugin's run in order to free up more memory and some very large SGF files will not even load on devices with little available memory.

Note: The plugin does *NOT* support SGF files with multiple games in one file. These are rare, but if you have one don't even try it (the file will most likely be corrupted if you save over it). You have been warned.

The file `/sgf/gbn_def.sgf` is used by the plugin to store any unsaved changes in the most recently loaded game. This means that if you forget to save your changes, you should load `/sgf/gbn_def.sgf` immediately to offload the changes to another file. If you load another file first then your changes will be lost permanently. The `/sgf/gbn_def.sgf` file is also the file loaded if another is not selected.

The information panel which displays the current move number may also contain these markers:

Mark	Meaning
+	There are nodes after the current node in the SGF tree.
*	There are sibling variations which can be navigated to using the *Next Variation* menu option of the *Context Menu*.
C	There is a comment at the current node. It can be viewed/edited using the *Add/Edit Comment* menu option of the *Context Menu*.

Controls

Key	Action
Up	Move cursor up
Down	Move cursor down
Left	Move cursor left if in *board* navigation mode, or retreat one node in the game tree if in *tree* navigation mode
Right	Move cursor right if in *board* navigation mode, or advance one node in the game tree if in *tree* navigation mode
On/Off	Toggle between *board* and *tree* navigation modes
Mode	Play a move (or use a tool if play-mode has been changed).
Long **Mode**	Main Menu

Menus

Main Menu. The main menu for game setup and access to other menus.

New. Create a new game with your choice of board size and handicaps.

Save. Save the current state of the game. It will be saved to `/sgf/gbn_def.sgf` unless otherwise set.

Save As. Save to a specified file.

Game Info. View and modify the metadata of the current game.

Playback Control. Control the playback of the current playlist and modify the volume of your player.

Zoom Level. Zoom in or out on the board. If you set the zoom level, it will be saved and used again the next time you open this plugin.

Options. Open the Options Menu.

Context Menu. Open the Context Menu which allows you to set play modes and other tools.

Quit. Leave the plugin. Any unsaved changes are saved to `/sgf/gbn_def.sgf`.

Game Info. The menu for modifying game info (metadata) of the current game. This information will be saved to the SGF file and can be viewed in almost all SGF readers.

Basic Info. Shows a quick view of the basic game metadata, if any has been set (otherwise does nothing). This option does not allow editing.

Time Limit. The time limit of the current game.

Overtime. The overtime settings of the current game.

Result. The result of the current game. This text must follow the format specified at http://www.red-bean.com/sgf/properties.html#RE to be read by other SGF readers. Some examples are *B+R* (Black wins by resignation), *B+5.5* (Black wins by 5.5 points), *W+T* (White wins on Time).

Handicap. The handicap of the current game.

Komi. The komi of the current game (compensation to the white player for black having the first move).

Ruleset. The name of the ruleset in use for this game. The *NZ* and *GOE* rulesets include suicide as a legal move (for multi-stone suicide only); the rest do not.

Black Player. The name of the black player.

Black Rank. Black's rank, in dan or kyu.

Black Team. The name of black's team, if any.

White Player. The name of the white player.

White Rank. White's rank, in dan or kyu.

White Team. The name of white's team, if any.

Date. The date that this game took place. This text must follow the format specified at http://www.red-bean.com/sgf/properties.html#DT to be read by other SGF readers.

Event. The name of the event which this game was a part of, if any.

Place. The place that this game took place.

Round. If part of a tournament, the round number for this game.

Done. Return to the previous menu.

Options. Customize the behavior of the plugin in certain ways.

Show Child Variations? Enable this to mark child variations on he board if there are more than one. Note: variations which don't start with a move are not visible in this way.

Disable Idle Poweroff? Enable this if you do not want the player to turn off after a certain period of inactivity (depends on your global Rockbox settings).

Idle Autosave Time. Set the amount of idle time to wait before automatically saving any unsaved changes. These autosaves go to the file `/sgf/gbn_def.sgf` regardless of if you have loaded a game or used Save As to save the game before or not. Set to Off to disable this functionality completely.

Automatically Show Comments? If this is enabled and you navigate to a node containing game comments, they will automatically be displayed.

Context Menu. The menu for choosing different play modes and tools, adding or editing comments, adding pass moves, or switching between sibling variations.

Play Mode. Play moves normally on the board. If there are child moves from the current node, this mode will let you follow variations by simply playing the first move in the sequence. Unless it is following a variation, this mode will not allow you to play illegal moves. This is the default mode before another is set after loading a game or creating a new one.

Add Black Mode. Add black stones to the board as desired. These stones are not moves and do not perform captures or count as ko threats.

Add White Mode. Add white stones to the board as desired. These stones are not moves and do not perform captures or count as ko threats.

Erase Stone Mode. Remove stones from the board as desired. These removed stones are not counted as captured, they are simply removed.

Pass. Play a single pass move. This does not change the mode of play.

Next Variation. If the game is at the first move in a variation, this will navigate to the next variation after the current one. This is the only way to reach variations which start with adding or removing stones, as you cannot follow them by "playing" the same move.

Force Play Mode. The same as Play Mode except that this mode will allow you to play illegal moves such as retaking a ko immediately without a ko threat, suicide on rulesets which don't allow it (including single stone suicide), and playing a move where there is already a stone.

Mark Mode. Add generic marks to the board, or remove them.

Circle Mode. Add circle marks to the board, or remove them.

Square Mode. Add square marks to the board, or remove them.

Triangle Mode. Add triangle marks to the board, or remove them.

Label Mode. Add one character labels to the board. Each label starts at the letter 'a' and each subsequent application of a label will increment the letter. To remove a label, click on it until it cycles through the allowed letters and disappears.

Add/Edit Comment. Add or edit a comment at the current node.

Done. Go back to the previous screen.

10.1.10. Jackpot

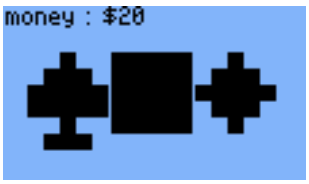

Figure 10.9.: Jackpot

This is a jackpot slot machine game. At the beginning of the game you have 20$. Payouts are given when three matching symbols come up.

Key	Action
Mode	Play
On/Off	Exit the game

10.1.11. Jewels

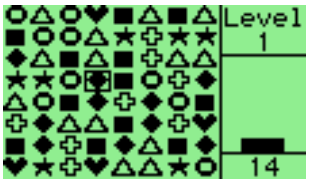

Figure 10.10.: Jewels

Jewels is a simple yet addicting game which involves swapping pairs of jewels in order to form connected segments of three or more of the same type.

The goal of the game is to score as many points as possible before running out of available moves. Higher points are awarded to larger combos. The game advances to the next level after every one hundred points and randomly clears several jewels.

In puzzle mode the aim of the game is to connect the puzzles, by skillfully swapping pairs of jewels.

Key	Action
Left/Right/ Up/Down	Move the cursor around the jewels
Mode	Select a jewel
On/Off	Menu

10.1.12. Maze

This is a simple maze generator that creates perfect mazes that have only one solution.

Key	Action
Up/Down/Left/Ri	Navigate maze
On/Off	Exit plugin
Long **Mode**	New Maze
Mode	Display solution (toggle)

10.1.13. MazezaM

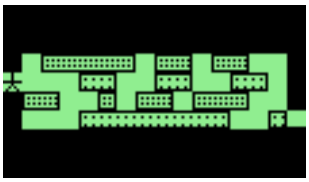

Figure 10.11.: MazezaM

The goal of this puzzle game is to escape a dungeon consisting of ten "mazezams". These are rooms containing rows of blocks which can be shifted left or right. You can move the rows only by pushing them and if you move the rows carelessly, you will get stuck. You can have another go by selecting "retry level" from the menu, but this will cost you a life. You start the game with three lives. Luckily, there are checkpoints at levels four and eight.

Key	Action
Up, **Down**, **Left**, **Right**	Move Character
On/Off	Menu

10.1.14. Minesweeper

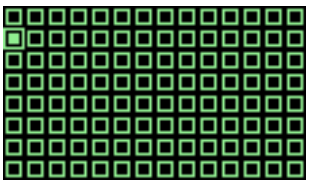

Figure 10.12.: Minesweeper plugin

The classic game of minesweeper. The aim of the game is to uncover all of the squares on the board. If a mine is uncovered then the game is over. If a mine is not uncovered, then the number of mines adjacent to the current square is revealed. The aim is to use the information you are given to work out where the mines are and avoid them. When the player is certain that they know the location of a mine, it can be tagged to avoid accidentally "stepping" on it.

Key	Action
Up / **Down** / **Left** / **Right**	Move the cursor across the minefield
Mode	Toggle flag on / off
Long **Mode**	Reveal the contents of the current square
Long **Mode+On/Off**	Display the current game status
On/Off	Exit the game

10.1.15. Pegbox

Figure 10.13.: pegbox

To beat each level, you must destroy all of the pegs. If two like pegs are pushed into each other they disappear except for triangles which form a solid block and crosses which

allow you to choose a replacement block.

Key	Action
Up, **Down**, **Left**, **Right**	to move around
On/Off	to choose peg
Mode + **Right**	to restart level
Mode + **Up**	to go up a level
Mode + **Down**	to go down a level
Mode + **On/Off**	to quit

10.1.16. Pong

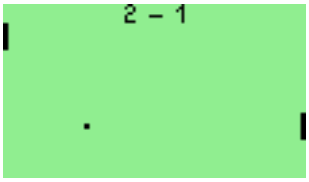

Figure 10.14.: Pong

Pong is a simple one or two player "tennis game". Whenever a player misses the ball the other scores.

The game starts in demo mode, with the CPU controlling both sides.

As soon as a button to control one of the paddles is pressed, control of that paddle passes to the player, so for a single player game, just press the appropriate buttons to control the side you want to play. For a two player game, both players should just press the appropriate buttons for their side.

Key	Action
Left	Left player up
Mode	Left player down
Up	Right player up
Down	Right player down
On/Off	Quit

10.1.17. Reversi

This is a simple implementation of the Reversi game. The objective of the game is to have a majority of own coloured pieces showing at the end of the game. The game rules can be found in the internet.

You can choose to play manually (you place both the white and dark pieces) or to play against a (not very smart) robot.

10.1.18. Robotfindskitten

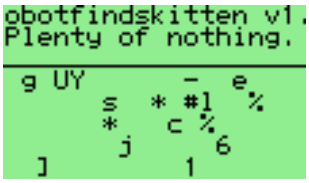

Figure 10.15.: Robotfindskitten

In this game, you are robot (#). Your job is to find kitten. This task is complicated by the existence of various things which are not kitten. Robot must touch items to determine if they are kitten or not. The game ends when robotfindskitten.

Key	Action
Up, **Down**, **Left**, **Right**	Move robot
On/Off	Quit

10.1.19. Rockblox

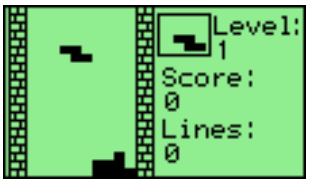

Figure 10.16.: Rockblox

Rockblox is a Rockbox version of the classic falling blocks game from Russia. The aim of the game is to make the falling blocks of different shapes form full rows. Whenever

a row is completed, it will be cleared away, and you gain points. For every ten lines completed, the game level increases, making the blocks fall faster. If the pile of blocks reaches the ceiling, the game is over.

Key	Action
Mode+On/Off	Restart game
Left	Move left
Right	Move right
Down	Move down
Mode+Up	Rotate anticlockwise
Up	Rotate clockwise
Mode	Drop
On/Off	Quit

10.1.20. Rockblox1d

Rockblox1d is a game for people who find rockblox too hard. In this version the second dimension is missing so the user only has to move the bricks down. No horizontal moving anymore and no need to rotate the brick!

Key	Action
Down	Move down faster
On/Off or Long **On/Off**	Quit

10.1.21. Sgt-Puzzles

WARNING! Image not found

Figure 10.17.: "Cube", a rolling solid puzzle

WARNING! Image not found

Figure 10.18.: "Map", a 4-coloring game

The games that begin with the "sgt-" prefix are ports of certain puzzles from Simon Tatham's Portable Puzzle Collection, an open source collection of single-player puzzle games.

Note: Certain puzzles may crash when run with demanding configurations. To prevent this, avoid setting extreme configuration values.

Puzzle Documentation

For documentation on the games included, please see the "Extensive Help" menu option from inside the plugin to read puzzle-specific instructions or visit their official website at https://www.chiark.greenend.org.uk/~sgtatham/puzzles/.

Dynamic Font Sizing

By default, each game will only use one of two fonts in drawing: the hard-coded system font for fixed-width text, and the theme's UI font for variable-width text. For improved puzzle rendering, each puzzle is capable of using a special font pack when it is installed. This font pack is available from http://download.rockbox.org/useful/sgt-fonts.zip. To install, simply extract the contents of this file to the `/.rockbox/fonts/` directory on your device. Once this has been done, each game will dynamically load and use properly-sized fonts whenever needed.

Note: On hard disk-based devices, this may cause a slight delay as the disk spins up to load the fonts when a puzzle is first started, and after using the "Extensive Help" feature.

"Zoom In" Feature

The "Zoom In" feature is available as an option from the pause menu. It has two modes: viewing mode, and interaction mode. The current mode is indicated in the title bar at the bottom of the screen. This feature is most useful with low-resolution devices and large puzzles.

Viewing mode is entered when the "Zoom In" option is selected, or when **On/Off** is pressed in interaction mode. It allows you to pan around an enlarged version of the game. The directional keys pan the image by a small amount in their respective directions, and **Mode** should toggle interaction mode. To return to the pause menu from viewing mode, press **On/Off**.

In interaction mode, activated from viewer mode by pressing **Mode**, your device's buttons all function as they do in the normal gameplay mode, with the exception of **On/Off**, which returns the game to viewing mode, whereas in the normal gameplay mode it would return directly to the pause menu. To return to the pause menu from interaction mode, press **On/Off** twice.

Note: Using certain features such as the "Zoom In" option may stop audio playback. This is normal, as the game requires additional memory from the system, which will

automatically stop playback. The "Playback Control" menu will be hidden whenever this happens. Exiting the game will allow the resumption of audio playback.

10.1.22. Sliding Puzzle

Figure 10.19.: Sliding puzzle

The classic sliding puzzle game. Rearrange the pieces so that you can see the whole picture, or switch to number tiles if you like it a little easier Includes one picture puzzle. You can also use the sliding puzzle plugin as a viewer for supported image types, to turn your own pictures into a puzzle.

Key controls:

Key	Action
Left, **Right**, **Up** and **Down**	Move Tile
Long **Mode**	Shuffle
Mode	Switch between pictures (default puzzle, and your own image if launched via Open With), and numbered tiles
On/Off	Stop the game

10.1.23. Snake

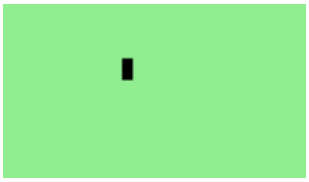

Figure 10.20.: Snake

This is the popular snake game. The aim is to grow your snake as large as possible by eating the dots that appear on the screen. The game will end when the snake touches either the borders of the screen or itself.

Key	Action
Up / **Down** / **Left** / **Right**	Move snake
Mode	Toggle Play/Pause
	Go to the plugin's menu

10.1.24. Snake 2

Figure 10.21.: Snake 2 – The Snake Strikes Back

Another version of the Snake game. Move the snake around, and eat the apples that pop up on the screen. Each time an apple is eaten, the snake gets longer. The game ends when the snake hits a wall, or runs into itself.

Key	Action
Up / **Down** / **Left** / **Right**	Steer the snake
Mode	Pause and resume the game
On/Off	Quit

In game A, the maze stays the same, in game B after an increasing number of apples eaten the maze is replaced by a new one.

10.1.25. Sokoban

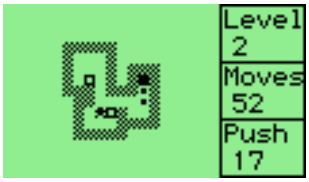

Figure 10.22.: Sokoban

The object of the game is to push boxes into their correct position in a crowded warehouse with a minimal number of pushes and moves. The boxes can only be pushed, never pulled, and only one can be pushed at a time.

Sokoban may be used as a viewer for viewing saved solutions and playing external level sets with the `.sok` extension. Level sets should be in the standard Sokoban text format or RLE (Run Length Encoded). For more information about the level format, see http://sokobano.de/wiki/index.php?title=Level_format

Key	Action
	In game
Up, **Down**, **Left**, **Right**	Move the "sokoban" up, down, left, or right
On/Off	Menu
Mode+Left	Back to previous level
Mode+Up	Restart level
Mode+Right	Go to next level
Mode	Undo last movement
Mode+Down	Redo previously undone move
	Solution playback
Mode	Pause/resume
Up/Down	Increase/decrease playback speed
Left/Right	Go backward/forward (while paused)
On/Off	Quit

Some places where can you can find level sets:

- http://www.sourcecode.se/sokoban/levels.php
- http://sokobano.de/en/levels.php

Note that some level sets may contain levels that are too large for this version of Sokoban and are unplayable as a result.

10.1.26. Solitaire

Figure 10.23.: Klondike solitaire

This is the classic Klondike solitaire game for Rockbox. This is probably the best-known solitaire in the world. Many people do not even realize that other games exist. Though the name may not be familiar, the game itself certainly is. This is due in no small part to Microsoft's inclusion of the the game in every version of Windows. Though popular, the odds of winning are rather low, perhaps one in thirty hands.

For the full set of rules to the game, and other interesting information visit http://www.solitairecentral.com/rules/Klondike.html

Key	Action
Up / **Down** / **Left** / **Right**	Move Cursor around.
Mode	Select cards, move cards, reveal hidden cards...
Long **Mode**	If a card was selected – unselect it, else
	Draw 3 new cards from the remains stack
Long **Down**	Put the card from the top of the remains stack on top of the cursor
Long **Up**	Put the card under the cursor on one of the 4 final colour stacks.
Long **Right**	Put the card on top of the remains stack on one of the final colour stacks.
On/Off	Show menu

10.1.27. Spacerocks

Figure 10.24.: Spacerocks

Spacerocks is a clone of the old arcade game Asteroids. The goal of the game is to blow up the asteroids and avoid being hit by them. Once in a while, a UFO will appear – shoot this for extra points.

Key	Action
Mode	Shoot
Up	Thrust
Left/ Right	Turn left/right
Down	Teleport
Mode+On/Off	Pause game
On/Off	Quit

10.1.28. Star

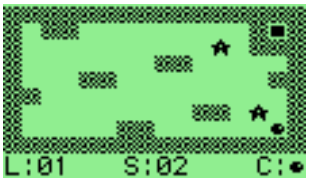

Figure 10.25.: Star game

This is a puzzle game. It is actually a rewrite of Star, a game written by CDK designed for the hp48 calculator.

Rules: Take all of the “o”s to go to the next level. You can switch control between the filled circle, which can take “o”s, and the filled square, which is used as a mobile wall to allow your filled circle to get to places on the screen it could not otherwise reach. The block cannot take “o”s.

Key	Action
Left	Move Left
Right	Move Right
Up	Move Up
Down	Move Down
Mode	Switch between circle and square
Mode+Left	Previous level
Mode+Up	Reset level
Mode+Right	Next level
On/Off	Exit the game

10.1.29. Sudoku

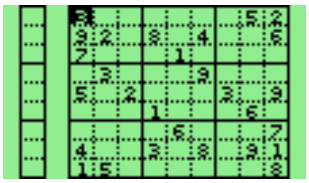

Figure 10.26.: Sudoku

Sudoku in Rockbox can act as both a plugin and a viewer. When starting Sudoku from the Browse Plugins menu, a random game will be generated automatically, and an estimate of its difficulty (very easy, easy, medium, hard or fiendish) will be displayed on the screen. New games can be generated from the Generate menu option. When "playing" an existing Sudoku game file from Rockbox' file browser the plugin is invoked as viewer. The selected Sudoku will get loaded and you can start solving it. The sudoku games need to be stored as text files with the extension `.ss` as single file per game.

You can create and save your own grids under the New menu option. Enter the menu (as described in the key table below) when you have finished and enter the full path to save to including the `.ss` extension (e.g. `/sudoku/new.ss`).

The scratchpad

When you play Sudoku on paper most people like to mark numbers in cells that are possible candidates for the cells. This can be done with the scratchpad, shown as separate column. Change the number under the cursor to the number you want to put on the scratchpad and press the scratchpad button, the number will then be added. If the number was already on the scratchpad it will get removed again. The column is stored

separately for every cell on the board. The stored values can be displayed inline as small dots by enabling the Show Markings settings.

Note: The scratchpad is *not* saved when saving the game.

Key	Action
Up / **Down** / **Left** / **Right**	Move the cursor
Mode	Change number under the cursor
Long **Mode+Down**	Constantly changing the number under the cursor
Long **Mode**	Open Menu
Mode+Left	Add/Remove number to scratchpad
On/Off	Quit

Some places where can you can find `.ss` files:

- Simple Sudoku (Advanced Puzzle Packs 1 and 2 located near the bottom of that page): http://www.angusj.com/sudoku/
- Kjell's Sudoku generator/solver: http://kjell.haxx.se/sudoku/

10.1.30. Wormlet

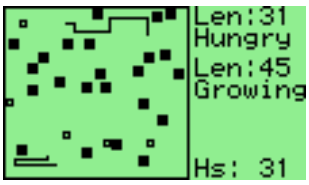

Figure 10.27.: Wormlet game

Wormlet is a multi-worm game on a multi-threaded multi-functional Rockbox console. You navigate a hungry little worm. Help your worm to find food and to avoid poisoned argh-tiles. The goal is to turn your tiny worm into a big worm for as long as possible.

Game controls:

Key	Action
Left	Turn left
Right	Turn right
Up	Turn Up
Down	Turn Down

The game

Use the control keys of your worm to navigate around obstacles and find food. Worms do not stop moving except when dead. Dead worms are no fun. Be careful as your worm will try to eat anything that you steer it across. It won't distinguish whether it is edible or not.

Food. The small square hollow pieces are food. Move the worm over a food tile to eat it. After eating the worm grows. Each time a piece of food has been eaten a new piece of food will pop up somewhere. Unfortunately for each new piece of food that appears two new "argh" pieces will appear, too.

Argh. An "argh" is a black square poisoned piece - slightly bigger than food - that makes a worm say "Argh!" when run into. A worm that eats an "argh" is dead. Thus eating an "argh" must be avoided under any circumstances. "Arghs" have the annoying tendency to accumulate.

Worms. Thou shall not eat worms. Neither other worms nor thyself. Eating worms is blasphemous cannibalism, not healthy and causes instant death. And it doesn't help anyway: the other worm isn't hurt by the bite. It will go on creeping happily and eat all the food you left on the table.

Walls. Don't crash into the walls. Walls are not edible. Crashing a worm against a wall causes it a headache it doesn't survive.

Game over. The game is over when all worms are dead. The longest worm wins the game.

Pause the game. Press **Mode** to pause the game. Press it again to resume the game.

Stop the game. There are two ways to stop a running game.

- If you want to quit Wormlet entirely simply hit **On/Off**. The game will stop immediately and you will return to the game menu.
- If you want to stop the game and still see the screen hit **On/Off+Mode**. This freezes the game. If you hit **On/Off+Mode** button again a new game starts with the same configuration. To return to the games menu you can hit **On/Off** . A stopped game can not be resumed.

The scoreboard

On the right side of the game field is the score board. For each worm it displays its status and its length. The top most entry displays the state of worm 1, the second worm 2 and the third worm 3. When a worm dies its entry on the score board turns black.

Len: Here the current length of the worm is displayed. When a worm is eating food it grows by one pixel for each step it moves.

Hungry: That's the normal state of a worm. Worms are always hungry and want to eat. It is good to have a hungry worm since it means that your worm is alive. But it is better to get your worm growing.

Growing: When a worm has eaten a piece of food it starts growing. For each step it moves over food it can grow by one pixel. One piece of food lasts for 7 steps. After your worm has moved 7 steps the food is used up. If another piece of food is eaten while growing it will increase the size of the worm for another 7 steps.

Crashed: This indicates that a worm has crashed against a wall.

Argh: If the score board entry displays "Argh!" it means the worm is dead because it tried to eat an "argh". Until we can make the worm say "Argh!" it is your job to say "Argh!" aloud.

Wormed: The worm tried to eat another worm or even itself. That's why it is dead now. Making traps for other players with a worm is a good way to get them out of the game.

Hints

- Initially you will be busy with controlling your worm. Try to avoid other worms and crawl far away from them. Wait until they curl up themselves and collect the food afterwards. Don't worry if the other worms grow longer than yours - you can catch up after they've died.
- When you are more experienced watch the tactics of other worms. Those worms controlled by artificial stupidity head straight for the nearest piece of food. Let the other worm have its next piece of food and head for the food it would probably want next. Try to put yourself between the opponent and that food. From now on you can 'control' the other worm by blocking it. You could trap it by making a 1 pixel wide U-turn. You also could move from food to food and make sure you keep between your opponent and the food. So you can always reach it before your opponent.

10.1.31. Xobox

Figure 10.28.: Xobox

Xobox is a simple clone of the well known arcade game Qix. The aim of the game is to section off parts of the arena with your trail in order to remove that section from the game. Be careful not to get in the way of enemy balls because, if they hit you or your trail, you lose a life. To finish a level you have to section off more than 75%.

Key	Action
Up, **Down**, **Left**, **Right**	Move around the arena
Mode	Pause
On/Off	Open menu

10.2. Demos

10.2.1. Bounce

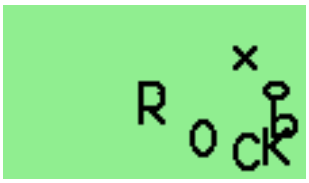

Figure 10.29.: Bounce

This demo is of the word “Rockbox” bouncing across the screen. In Scroll mode the bouncing text is replaced by a different one scrolling from right to left.

Key	Action
Up/ Down	Moves to next/previous option
Right / Left	Increases/decreases option value
Mode	Toggles Scroll mode
On/Off or Long **On/Off**	Exits bounce demo

Available options are:

Xdist/Ydist. The distance to X axis and Y axis respectively

Xadd/Yadd. How fast the code moves on the sine curve on each axis

Xsane/Ysane. Changes the appearance of the bouncing.

10.2.2. Credits

The credits plugin scrolls the entire list of the names of all the Rockbox contributors after displaying the Rockbox logo and version. This plugin is called when selecting Version from the System section of the Rockbox main menu. Exit at any time by pressing **Left** or **On/Off**.

10.2.3. Cube

Figure 10.30.: Cube

This is a rotating cube screen saver in 3D.

Key	Action
Mode+Right	Display at maximum frame rate
Mode+Left	Pause
Mode	Cycle draw mode
Right / Left	Select axis to adjust
Up / Down	Change speed/angle (speed can not be changed while paused)
On/Off	Quit

10.2.4. Demystify

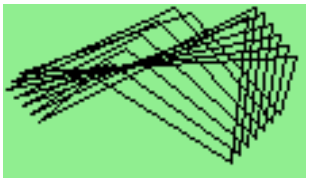

Figure 10.31.: Demystify

Demystify is a screen saver like demo.

Key	Action
Left / Right	Increase / decrease speed
Up / Down	Add / remove polygon
On/Off	Quit

10.2.5. Fire

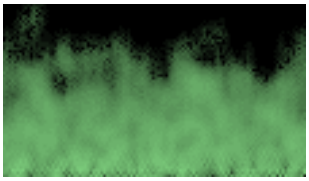

Figure 10.32.: Fire

Fire is a demo displaying a fire effect.

Key	Action
Up / Down	Increase / decrease number of flames
Left	Toggle flame type
Right	Toggle moving flames
On/Off	Quit

10.2.6. Fractals

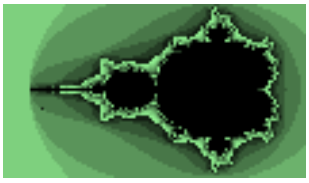

Figure 10.33.: Fractals: Mandelbrot set

This demonstration draws fractal images from the Mandelbrot set using the greyscale engine.

Key	Action
Direction keys	Move about the image
Mode / **Mode+Up**	Zoom in
Mode+Down	Zoom out
Mode+Left	Decrease iteration depth (less detail)
Mode+Right	Increase iteration depth (more detail)
Mode+On/Off	Reset and return to the default image
On/Off	Quit

10.2.7. Logo

Demo showing the Rockbox logo bouncing around the screen.

Key	Action
Right / **Left**	Increase / decrease speed on the x-axis
Up / **Down**	Increase / decrease speed on the y-axis
On/Off or Long **On/Off**	Quit

10.2.8. Matrix

This plugin is a visual demo resembling the scrolling code from "The Matrix" (https://en.wikipedia.org/wiki/The_Matrix).

10.2.9. Mosaique

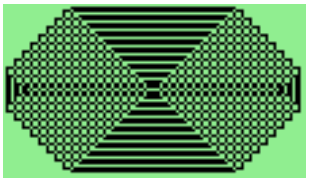

Figure 10.34.: Mosaique

This simple graphics demo draws a mosaic picture on the screen of the player.

Key	Action
Up	Change the gap between the drawing lines.
Mode	Restart the drawing process.
On/Off or Long **On/Off**	Exits Mosaique demo

10.2.10. Oscilloscope

Figure 10.35.: Oscilloscope

This demo shows the shape of the sound samples that make up the music being played.

Keys

Key	Action
Mode	Toggle filled / curve / plot
Mode+Right	Toggle whether to scroll or not
Mode+Left	Toggle drawing orientation
Mode+On/Off	Pause the demo
Up / Down	Increase / decrease volume
Right / Left	Increase / decrease speed
On/Off	Exit demo

10.2.11. PictureFlow

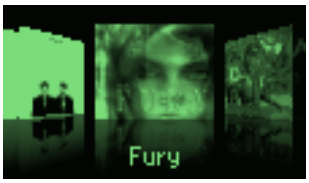

Figure 10.36.: PictureFlow

PictureFlow provides a visualisation of your albums with their associated cover art.

Note: PictureFlow is a visualisation only. It cannot be used to select and play music. Also, using this plugin will cause playback to stop.

Requirements

PictureFlow uses both the album art (see section B (page 145)) and database (see section 4.2 (page 24)) features of Rockbox. It is therefore important that these are working correctly before attempting to use PictureFlow. In addition, there are some other points of which to be aware:

- PictureFlow will accept album art larger than the dimensions of the screen, but the larger the dimensions, the longer they will take to scale.

Keys

Key	Action
Left / **Right**	Scroll through albums
Up / **Down**	Scroll through track list
Up	Enter track list
Mode	Play album from selected track in track list
Left	Exit track list
Long **Mode** Long **Mode**	Enter menu
On/Off	Exit PictureFlow

Main Menu

Go to WPS. Leave PictureFlow and enter the while playing screen.

Settings. Enter the settings menu.

Return. Exit menu.

Quit. Exit PictureFlow plugin.

Settings Menu

Show FPS. Displays frames per second on screen.

Spacing. The distance between the front edges of the side slides, i.e. changes the degree of overlap of the side slides. A larger number means less overlap. Scales with zoom.

Centre margin. The distance, in screen pixels, with zoom at 100, between the centre and side slides. Scales with zoom.

Number of slides. Sets the number of slides at each side, including the centre slide. Therefore if set to 4, there will be 3 slides on the left, the centre slide, and then 3 slides on the right.

Zoom. Changes the distance at which slides are rendered from the "camera".

Show album title. Allows setting the album title to be shown above or below the cover art, or not at all.

Resize Covers. Set whether to automatically resize the covers or to leave them at their original size.

Rebuild cache. Rebuild the PictureFlow cache. This is needed in order for PictureFlow to pick up new albums, and may occasionally be needed if albums are removed.

10.2.12. Plasma

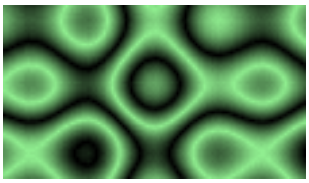

Figure 10.37.: Plasma

Plasma is a demo displaying a 80's style retro plasma effect.

Key	Action
Up / **Down**	Increase / decrease Frequency
On/Off / Long **On/Off**	Exit

10.2.13. Rocklife

This an implementation of J. H. Conway's Game of Life (see http://en.wikipedia.org/wiki/Conway%27s_Game_of_Life for a detailed description).

Rockbox can open files with a configuration description (`.cells` files). Just "play" such file and the game configuration stored in it will be loaded into this plugin.

A `.cells` file is a text file. A capital 'O' marks a live cell, a dot marks a dead cell, all other characters are ignored. Everything on a line starting with an exclamation sign (and including it) is a comment and is ignored.

Key	Action
Mode	Play/pause
Down	Change growth mode
Right	Next generation
Left	Status (only when paused)
On/Off	Exit

10.2.14. Snow

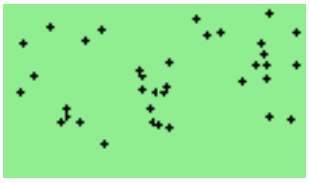

Figure 10.38.: Have you ever seen snow falling?

This demo replicates snow falling on your screen. If you love winter, you will love this demo. Or maybe not. Press **On/Off** or Long **On/Off** to quit.

10.2.15. Starfield

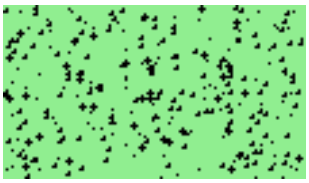

Figure 10.39.: Starfield

Starfield simulation (like the classic screensaver).

Key	Action
Right / **Left**	Increase / decrease number of stars
Up / **Down**	Increase / decrease speed
On/Off or Long **On/Off**	Quit

10.2.16. VU meter

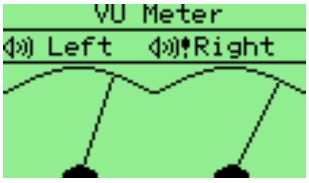

Figure 10.40.: VU-Meter

This is a VU meter, which displays the volume of the left and right audio channels. There are 3 types of meter selectable. The analogue meter is a classic needle style. The digital meter is modelled after LED volume displays, and the mini-meter option allows for the display of small meters in addition to the main display (as above). From the settings menu the decay time for the meter (its memory), the meter type and the meter scale can be changed.

Key	Action
On/Off	Save settings and quit
Mode	Help
Long **Mode**	Settings
Up	Raise Volume
Down	Lower Volume

10.3. Viewers

Viewers are plugins which are associated with specific file extensions. They cannot be run directly but are started by "playing" the associated file. Viewers are stored in the `/.rockbox/rocks/viewers/` directory.

Note: Some viewer plugins can only be used by selecting the Open With... option from the Context Menu (see section 4.1.2 (page 21)).

Viewer Plugin	Associated filetype(s)	Context Menu only
Shortcuts	`.link`	
Chip-8 Emulator	`.ch8`	
Frotz	`.z1` to `.z8`	
Image Viewer	`.bmp, .jpg, .jpeg, .png`	
Lua scripting language	`.lua`	
Movie Player	`.rvf`	
Search	`.m3u, .m3u8`	x
Shopping list	`.shopper`	
Sort	`.*`	x
Text Viewer	`.txt,.nfo, .*`	
VBRfix	`.mp3`	x
Wavplay	`.wav`	
ZXBox	`.tap, .tax, .sna, .z80`	

10.3.1. Shortcuts

The Shortcuts Plugin allows you to jump to places within the file browser without having to navigate there manually. The plugin works with `.link` files. A `.link` file is just a text file with every line containing the name of the file or the directory you want to quickly jump to. All names should be full absolute names, i.e. they should start with a `/`. Directory names should also end with a `/`.

How to create `.link` files

You can use your favourite text editor to create a `.link` file on the PC an then copy the file to the player. Or you can use the context menu on either a file or a directory in the file browser tree, and use the "Add to shortcuts" menu option. This will append a line with the full name of the file or the directory to the `shortcuts.link` file in the root directory of the player. (The file will be created if it does not exist yet.) You can later rename the automatically created `shortcuts.link` file or move it to another directory if you wish. Subsequent calls of the context menu will create it again.

How to use `.link` files, i.e. jump to desired places

To use a `.link` file just "play" it from the file browser. This will show you a list with the entries in the file. Selecting one of them will then exit the plugin and leave you within the directory selected, or with the file selected in the file browser. You can then play the file or do with it whatever you want. The file will not be "played" automatically.

If the `.link` file contains only one entry no list will be shown, you will directly jump to that location. The file `shortcuts.link` in the root directory is an exception. After "playing" it, the list will be shown even if the file contains just one entry.

If the list you are seeing is from `shortcuts.link` in the root directory, you can delete the selected entry by pressing Long **Mode**. Deleting entries from other `.link` files is not possible.

Advanced Usage

Placing the line "#Display last path segments=n" (where n is a number) in the beginning of a `.link` file will leave just the last n segments of the entries when they are shown. For example, if n is chosen to be 1, then the entry `/MyMusic/collection/song.mp3` will be shown as `song.mp3`. This allows you to hide common path prefixes.

You can also provide a custom display name for each entry individually. To do so, append a tabulator character after the entry's path followed by your custom name. That name will then be used for showing the entry. For example:

Example

```
/MyMusic/collection/song.mp3<TAB>My favourite song!
```

10.3.2. Chip-8 Emulator

Chip8 is a kind of assembly language for a long-gone architecture. This plugin runs games written using the chip8 instructions. To start a game open a `.ch8` file in the File Browser

There are lots of tiny Chip8 games (usually only about 256 bytes to a couple of KB) which were made popular by the HP48 calculator's emulator for them. The original Chip8 had 64×32 pixel graphics, and the new superchip emulator supports 128×64 graphics.

The only problem is that they are based on a 4×4 keyboard, but since most games do not use all of the buttons, this can easily be worked around.

To do this, one may put a `.c8k` file with the same name as the original program which contains new key mappings (for `BLINKY.ch8`, one writes a `BLINKY.c8k` file). That `.c8k` file contains 16 characters describing the mapping from the Chip8 keyboard to the default key mapping (that way, several Chip8 keys can be pressed using only one Rockbox key). For example, a file containing the single line:

Code

```
0122458469ABCDEF
```

would correspond to the following non-default mappings:

3 → 2, 6 → 8, 7 →4, 8 → 6.

The default keymappings are:

Chip8	Off	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Key	**On/Off**		**Up**	**Up**		**Left**	**Mode**	**Right**		**Down**							

Some places where can you can find `.ch8` files:

- The PluginChip8 page on www.rockbox.org has several attached: ☞PluginChip8
- Check out the HP48 chip games section: http://www.hpcalc.org/hp48/games/chip/
- Links to other chip8 emulators: http://www.zophar.net/chip8.html

10.3.3. Frotz

Frotz is a Z-Machine interpreter for playing Infocom's interactive fiction games, and newer games using the same format. To start a game open a `.z1` to `.z8` file in the File Browser. Most modern games are in the `.z5` or `.z8` format but the older formats used by Infocom are supported.

Z-Machine games are text based and most depend heavily on typed commands. The virtual keyboard is used for text entry, both for typing entire lines and for typing single characters when the game requires single character input.

Sounds, pictures, colour and Unicode are not currently supported, but the interpreter informs the game of this and almost all games will adapt so that they are still playable. This port of Frotz attempts to be compliant with the Z-Machine Specification version 1.0.

Some places where you can find Z-Machine games, and information about interactive fiction:

- The Interactive Fiction Archive, where many free modern works can be downloaded: http://www.ifarchive.org/
- The specific folder on the if-archive containing Z-Machine games: http://www.ifarchive.org/indexes/if-archiveXgamesXzcode.html
- A copy of the Infocom homepage, with information about the classic commercial Infocom games: http://www.vaxdungeon.com/Infocom/
- The Frotz homepage (for the original Unix port): http://frotz.sourceforge.net/
- A Beginner's Guide to Playing Interactive Fiction: http://www.microheaven.com/IFGuide/

Key	Action
Up	Display keyboard to enter text
Mode	Press enter
On/Off	Open Frotz menu (not available at MORE prompts)
Long **On/Off**	Quit

10.3.4. Image Viewer

This plugin opens image files from the File Browser to display them using Rockbox's greyscale library. Supported formats are as follows.

Format	File-extension(s)
BMP	`.bmp`
JPEG	`.jpg, .jpe, .jpeg`
PNG	`.png`
GIF	`.gif`

Note: This plugin will cause playback to stop.

Key	Action
Up / **Down** / **Left** / **Right**	Move around in zoomed in image
Mode	Zoom in
Mode+Down	Zoom out
Mode+Right	Next image in directory
Mode+Left	Previous image in directory
On/Off	Show menu / Abort

The menu has the following entries.

Return. Returns you to the image

Toggle Slideshow Mode. Enables or disables the slideshow mode.

Change Slideshow Timeout. You can set the timeout for the slideshow between 1 second and 20 seconds.

Quit. Quits the viewer and returns to the File Browser.

Note: Progressive scan and other unusual JPEG files are not supported, and will result in various "unsupported xx" messages. Processing could also fail if the image is too big to decode which will be explained by a respective message.

10.3.5. Movie Player

Play movies on your player! In order to do this, movies must be in AVI format, and then converted to `.RVF`, Rockbox's own video format. For more details on how to use this plugin, please see ☞VideoTutorial.

10.3.6. Rockbox_flash

For "playing" `.UCL` files on a flashed player. Reprograms the flash memory of the player unit (see section 11.5 (page 139) for details).

10.3.7. Search

This plugin can be used on playlists. It searches through the playlist that it opened on looking for any occurrences of the string entered by the user. The results of this search are saved to a new playlist, **search_results.m3u**, within the same directory as the original playlist.

10.3.8. Shopper

Shopper is a plugin which allows you to maintain reusable shopping lists. To create a list, use a text editor to write down a list of items (one per line; note that the line length should not exceed 40 characters) and save the file as `<name>.shopper`. If you want to separate the items you can do so by creating categories, which are prepended with '#'. To open a `.shopper` file just "play" it from the file browser.

Example

```
#groceries
bananas
cucumber
4 apples
6 apples
#dairy
milk
cheese
```

Note that it isn't possible to choose exact quantities, but you can create a number of entries with different quantities in the name of the item, such as for the apples in the above example.

There are two modes, *edit mode* and *view mode*. The edit mode shows all the items, and it allows you to select which of the items you want to buy. When you have finished selecting the items, use the menu to go to the view mode, and you will see only the items you wish to buy. If you 'select' an item in view mode then that item will be removed from the list.

When you exit Shopper the last view is saved, including which items you have selected, so if you re-open the shopping list it will be as you left it. There are additional menu options for clearing the list, selecting all items, showing and hiding the categories, toggling the categories, and displaying the playback menu.

Shopper Keys

Key	Action
Right	Select or clear an item
Long **Mode** or Long **Right**	Show menu
Left or **On/Off**	Exit

10.3.9. Sort

This plugin takes a file and sorts it in ascending alphabetical order. Case is ignored. This is useful for ordering playlists generated by the Create Playlist menu option (see section 5.8 (page 38)).

10.3.10. Text Viewer

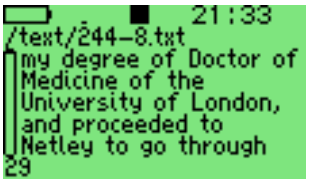

Figure 10.41.: Text Viewer

This is a Viewer for text files with word wrap. Just open a `.txt` or `.nfo` file to display it. The text viewer features controls to handle various styles of text formatting and has top-of-file and bottom-of-file buttons. You can view files without a `.txt` or `.nfo`

extension by using *Open with* from the *Context Menu* (see section 4.1.2 (page 21)). You can also bookmark pages.

Default keys

Key	Action
Up	Scroll-up
Down	Scroll-down
Left	Top of file (Narrow mode) / One screen left (Wide mode)
Right	Bottom of file (Narrow mode) / One screen right (Wide mode)
Mode	Toggle autoscroll
Mode+On/Off	Set/Reset bookmarks
Long **Mode**	Enter menu
On/Off	Exit text viewer

Menu

Return Return to the file being viewed.

Viewer Options Change settings for the current file.

- **Encoding** Set the codepage in the text viewer. Available settings: ISO-8859-1 (Latin 1). ISO-8859-7 (Greek), ISO-8859-8 (Hebrew), CP1251 (Cyrillic), ISO-8859-11 (Thai), CP1256 (Arabic), ISO-8859-9 (Turkish), ISO-8859-2 (Latin Extended), CP1250 (Central European), SJIS (Japanese), GB-2312 (Simple Chinese), KSX-1001 (Korean), BIG5 (Traditional Chinese), UTF-8 (Unicode), This setting only applies to the plugin and is independent from the Default Codepage setting (see section 8.4 (page 53)).
- **Word Wrap** Toggle word wrap mode.
  - **On** Break lines at the maximum column limit.
  - **Off (Chop Words)** Break lines at white space or hyphen.
- **Line Mode** Change how lines are displayed.
  - **Normal** Break lines at newline characters.
  - **Join** Join lines together.
  - **Expand** Add a blank line at newlines. Useful for making paragraphs clearer in some book style text files.
  - **Reflow Lines** Justify the text.

Screens Per Page Set the number of screens per page. Available options are 1 to 5 screens per page.

Alignment Set the text alignment.

- **Right** Set the text alignment to the right. (Useful for displaying right-to-left languages, such as Arabic or Hebrew)
- **Left** Set the text alignment to the left.

Show Header Select whether to show the header. The header displays the file path.

- **No** Do not display the header.
- **Yes** Display the header.

Show Footer Select whether to show the footer. The footer dispays the page number.

- **No** Do not display the footer.
- **Yes** Display the footer.

Font Select the font to be used by the Text Viewer.

Show Statusbar Select whether to show the status bar. If you select a theme settings that the status bar does not display (see section 9 (page 60)), the status bar is not displayed even if you select Yes.

- **No** Do not display the status bar.
- **Yes** Display the status bar.

Scroll Settings The scrolling settings submenu.

- **Horizontal** Submenu for horizontal scrolling settings.
  - **Scrollbar** Toggle the horizontal scrollbar for the current mode. If the file fits on one screen, there is no scrollbar and this setting has no effect.
    - **No** Do not display the horizontal scroll bar.
    - **Yes** Display the horizontal scroll bar.
  - **Scroll Mode** Change the function of the "Left" and "Right" buttons.
    - **Scroll by Screen** Move to the previous/next screen.
    - **Scroll by Column** Move to the previous/next column.
- **Vertical** Submenu for vertical scrolling settings.
  - **Scrollbar** Toggle the vertical scrollbar for the current mode. If the file fits on one screen, there is no scrollbar and this setting has no effect.
    - **No** Do not display the vertical scroll bar.
    - **Yes** Display the vertical scroll bar.
  - **Scroll Mode** Change the function of the "Scroll-up" and "Scroll-down" buttons.

Scroll by Page Scroll up or down one full screen.

Scroll by Line Scroll up or down one line.

Overlap Pages Set whether the last line from the previous screen is retained when scrolling pages.

No Do not retain previous line.

Yes Retain previous line.

Auto-scroll Speed Control the speed of auto-scrolling in number of lines per second. Available options are 1 to 10 lines per second. As an example, 4 will scroll the text at four lines per second.

Left/Right Key (Narrow mode) Change the function of the "Left" and "Right" buttons when the screen is in narrow mode (i.e. one screen per page).

Previous/Next Page Scroll up or down one full screen.

Top/Bottom Page Move to the top or bottom page.

Indent Spaces Set the number of spaces to indent the text when line mode is set to Reflow Lines. Available options are 0 to 5 spaces. If you select 0, a blank line is displayed as an indent.

Show Playback Menu Display the playback menu to allow control of the currently playing music without leaving the plugin.

Select Bookmark Select a saved bookmark. In the screenshot below, the "*" denotes the current page.

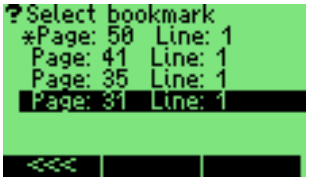

Figure 10.42.: The select bookmark menu

Global Settings Set the default settings for the text viewer. The setting items are the same as Viewer Options. The global settings are stored in `.rockbox/rocks/viewers/viewer.dat`.

Quit Exits the plugin. The text viewer automatically stores its settings, the current position and bookmarks in `.rockbox/rocks/viewers/viewer_file.dat`.

Bookmarks

To add a bookmark, press **Mode+On/Off**. The bookmark will be displayed as shown below. To delete the bookmark press the same button again.

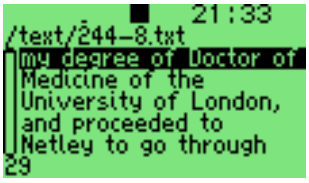

Figure 10.43.: A bookmark

10.3.11. Theme Remove

This plugin offers a way to remove a theme. Open the Context Menu (see section 4.1.2 (page 21)) upon a theme `.cfg` file and select Open With... → theme_remove. Some files are not removed regardless of the Remove Options such as `rockbox_default.wps` and the font file currently in use.

Theme Remove menu

Remove Theme. Selecting this will delete the files specified in the Remove Options. After a theme has been successfully removed, a log message is displayed listing which items have been deleted and which are being kept. Exit this screen by pressing any key. A file called `theme_remove_log.txt` is created in the root directory of your player listing all the changes.

Remove Options. This menu specifies which items are removed if Remove Theme is selected in the menu.

One of the following options can be chosen for each setting.

Ask for Removal. Selecting this option brings up a dialogue with two options: press **Right** to confirm deletion or any other key to cancel.

Remove if not Used. Selecting this option will remove the file automatically, if it is not used by another theme in the theme directory and not currently used.

Never Remove. Selecting this option will always skip deleting the file.

Always Remove. Selecting this option will remove the file with no regard to whether it's used by another theme or not.

Font. Specifies how the `.fnt` file belonging to a theme `.cfg` file is handled. If this option is set to Remove if not Used, the fonts came from rockbox-fonts.zip will not be removed as themes may depend on those fonts.

WPS. Specifies how the `.wps` file belonging to a theme `.cfg` file is handled.

Statusbar Skin. Specifies how the `.sbs` file belonging to a theme `.cfg` file is handled.

Iconset. Specifies how the iconset `.bmp` file belonging to a theme `.cfg` file is handled.

Viewers Iconset. Specifies how the viewers iconset `.bmp` file belonging to a theme `.cfg` file is handled.

Create Log File. Setting this to No prevents the log file from being created.

Quit. Exits this plugin.

10.3.12. VBRfix

This function scans a VBR (Variable Bitrate) MP3 file and updates/creates the Xing VBR header. The Xing header contains information about the VBR stream used to calculate average bit rate, time information and to more accurately fwd/rew in the stream. This function is especially useful when the playback of a file skips, fwd/rew does not work correctly or the time display is incorrect. To use this plugin, open the Context Menu (see section 4.1.2 (page 21)) upon a `.mp3` file and select Open With... → vbrfix.

Note: VBRfix can only run when music is turned off (since it uses the same memory as the player) and can take a while to complete if run on big files.

10.3.13. Wavplay

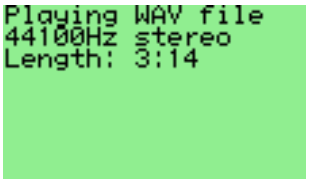

Figure 10.44.: Wavplay

This plugin is for demo purposes only. It is planned to have Wavplay as part of the normal playback engine later.

At the moment it is only possible to start playing one `.wav`-file at a time. Therefore playlists are impossible. As every other viewer plugin, Wavplay is associated with the specific files. Playing a `.wav`-file starts the plugin automatically and the Wavplay screen appears. This screen gives information about sample rate and length of the playing file.

Note: Seeking within the `.wav`-file or changing the volume once the plugin is running is not possible. Wavplay uses the sound settings that were used before (except for pitch).

The only action that can be performed is to stop by pressing **On/Off**, and Wavplay will be exited and you are returned to the file browser. If the end of the file has been reached, you will also be returned to the file browser.

10.3.14. ZXBox

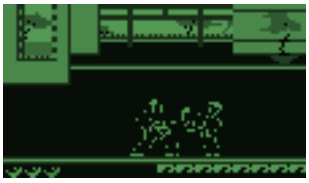

Figure 10.45.: ZXBox

ZXBox is a port of the "Spectemu" ZX Spectrum 48k emulator for Rockbox (https://sourceforge.net/projects/spectemu/). To start a game open a tape file or snapshot saved as `.tap`, `.tzx`, `.z80` or `.sna` in the file browser.

Note: As ZXBox is a 48k emulator only loading of 48k z80 snapshots is possible.

Default keys

The emulator is set up for 5 different buttons: Up, Down, Left, Right and Jump/Fire. Each one of these can be mapped to one key of the Spectrum Keyboard or they can be used like a "Kempston" joystick. Per default the buttons, including an additional but fixed menu button, are assigned as follows:

Key	Action
Up/Down/ Left/Right	Directional movement
Mode	Jump/Fire
On/Off	Open ZXBox menu

ZXBox menu

Vkeyboard. This is a virtual keyboard representing the Spectrum keyboard. Controls are the same as in standard Rockbox, but you just press one key instead of entering a phrase.

Play/Pause Tape. Toggles playing of the tape (if it is loaded).

Save Quick Snapshot. Saves snapshot into `/.rockbox/zxboxq.z80`.

Load Quick Snapshot. Loads snapshot from `/.rockbox/zxboxq.z80`.

Save Snapshot. Saves a snapshot of the current state. You would enter the full path and desired name – for example `/games/zx/snapshots/chuckie.sna`. The snapshot format will be chosen after the extension you specified, per default `.z80` will be taken in case you leave it open.

Toggle Fast Mode. Toggles fastest possible emulation speed (no sound, maximum frameskip etc.). This is Useful when loading tapes with some specific loaders.

Options. Map Keys To Kempston. Controls whether the player's buttons should simulate a "Kempston" joystick or some assigned keys of the Spectrum keyboard.

Display Speed. Toggle displaying the emulation speed (in percent).

Invert Colours. Inverts the Spectrum colour palette, sometimes helps visibility.

Frameskip Sets the number of frames to skip before displaying one. With zero frameskip ZXBox tries to display 50 frames per second.

Sound. Turns sound on or off.

Volume. Controls volume of sound output.

Predefined Keymap Select one of the predefined keymaps. For example 2w90z means: map ZXBox's **Up** to 2, **Down** to w, **Left** to 9, **Right** to 0 and **Jump/Fire** to z. This example keymap is used in the "Chuckie Egg" game.

Custom Keymap This menu allows you to map one of the Spectrum keys accessible through the plugin's virtual keyboard to each one of the buttons.

Quit. Quits the emulator..

Hacking graphics

Due to ZXBox's simple (but fast) scaling to the screen by dropping lines and columns some games can become unplayable. It is possible to hack graphics to make them better visible with the help of an utility such as the "Spectrum Graphics Editor". Useful tools can be found at the "World of Spectrum" site (http://www.worldofspectrum.org/utilities.html).

10.4. Applications

10.4.1. Battery Benchmark

The Battery Benchmark plugin enables you to test your battery's performance whilst using your player normally. Results can be submitted to the ☞BatteryRuntime wiki page.

How it works

Once loaded, Battery Benchmark runs in the background recording various information about your battery to memory. A new point is written to memory every minute.

Every time the disk is accessed for any reason (such as refilling the audio buffer, opening a directory or entering USB mode etc.) then the information in memory is written to disk. Once the memory becomes full (after many hours), then the data are written to disk anyway. This is done so that the data are not biased by excessive additional disk accesses. The file is written to the root directory of your player and is called `battery_bench.txt`. The plugin will continue to log info until:

- Another plugin is loaded.
- The player is shut down.
- The battery is empty.

Benchmarks can be resumed if you accidentally load a plugin, or turn off your player, so long as the log file `battery_bench.txt` is not deleted.

Information explained

At the top of the `battery_bench.txt` file is various information on how to use the plugin, followed by the data themselves.

Time This column reports the total time of operation of the player. It is not the time that you started the plug-in. If you have your player on for 5 minutes and then start the plugin, it will start measuring from 5 minutes.

Seconds The same as `Time`, except measured in seconds.

Level The percent level of the battery estimated by Rockbox, and not the actual battery level. The actual battery level can be seen from the `Voltage` column

Time Left This shows the time remaining until the battery is empty, again as estimated by Rockbox.

Voltage The battery voltage in mV at the moment the measurement was taken.

C This stands for Charger. An "A" in that column shows if the power adapter was attached to the unit at the time of the measurement.

U USB powered. Only for targets that support this. A "U" will indicate if the unit was using the USB port for power at the time of the measurement.

Usage

The log file can be used to tell you how long the battery lasted (with some limitations, see below), but it is most useful for graphing discharge curves in order to improve Rockbox's estimation of battery level and time remaining. The battery log (`battery_bench.txt`) is in CSV format (comma separated variables) and thus can be easily imported into a spreadsheet or similar program.

Limitations

As Battery Benchmark needs to write the data held in memory to disk in order to save them, it is possible that should Rockbox shut down due to low battery then there will not be enough power remaining to write the data to disk. Therefore all measurements since the previous save will be lost.

10.4.2. Calculator

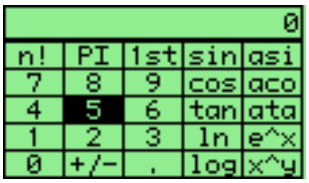

Figure 10.46.: Calculator

This is a simple scientific calculator for use on the player. It works like a standard calculator. Pressing the "1st" and "2nd" buttons will toggle between other available math functions.

Key	Action
Left / **Right** / **Up** / **Down**	Move around the keypad
Mode	Select a button
Long **Mode**	Calculate
On/Off	Quit

10.4.3. Chess Clock

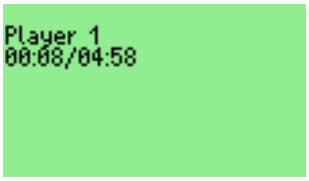

Figure 10.47.: Chess Clock

The chess clock plugin is designed to simulate a chess clock, but it can be used in any kind of game with up to ten players.

Setup

Key	Action
Up / Down	Increase / decrease displayed Value
Right	Move to next screen
Mode	Move to previous screen

- First enter the number of players (1–10)
- Then set the total game time in mm:ss
- Then the maximum round time is entered. For example, this could be used to play Scrabble for a maximum of 15 minutes each, with each round taking no longer than one minute.
- Done. Player 1 starts in paused mode.

While playing

The number of the current player is displayed on the top line. The time below is the time remaining for that round (and possibly also the total time left if different).

Keys are as follows:

Key	Action
On/Off	Exit plugin
Left	Restart round for the current player
Right	Pause the time (press again to continue)
Up	Switch to next player
Down	Switch to previous player
Mode	Open menu (**Right** to select.)

From the menu it is possible to delete a player, modify the round time for the current player or set the total time for the game. When the round time is up for a player the message "ROUND UP!" is shown (press NEXT to continue). When the total time is up for a player the message "TIME UP!"is shown. The player will then be removed from the timer.

10.4.4. Dict

Prerequisites for using the plugin

To use the plugin, firstly you need to have the dictionary files which contain the words (index) and their description – `dict.index` and `dict.desc`, respectively – on `/.rockbox/rocks/apps/` folder.

The dictionary files can be created by yourself, or you can get them crafted from the web. More information can be found at ☞PluginDict.

Using the plugin

Now that you already have the two necessary files in place, you can launch the dict plugin (under Applications on the Browse plugins menu). The first thing you will see is the text input screen.

Type part of a word (or the whole word) or anything the dict files have a definition to and accept the text input. The plugin will search for matching entries on the `dict.index` file and display according description/meaning contained in the `dict.desc` file.

If no matches are found on the dictionary, a "Not found" message will be displayed and the plugin will exit. You can do another search by relaunching the plugin.

10.4.5. Disk Tidy

Disk Tidy deletes junk files commonly left behind by Windows, Linux and OS X after connecting your player over USB. Select the files you want to delete in the "Files to Clean" menu and select "Start Cleaning" to begin the process. The settings are stored in the plain text file `.rockbox/rocks/apps/disktidy.config` that is user-modifiable to allow custom entries to be added.

The asterisk character ("*") can be used as a wild-card which will match any string; however only the first asterisk will be recognised as a wild-card with any additional uses being taken as literal.

Warning: Be careful when you use custom entries as you could accidentally delete important files.

Available Options

All selects all Linux, OS X, and Windows files.

None deselects all file options.

Linux selects Linux files. Default files are `.dolphinview`, `.d3lphinview`, and `.Trash-*/`.

Windows selects Windows files. Default files are `Thumbs.db`, `$RECYCLE.BIN/`, `Desktop.ini`, `Recycled/` and `System Volume Information/`.

Mac selects OS X files. Default files are `._*`, `.DS_Store`, `.Spotlight-V100/` and `.Trashes/`.

Other selects additional files added to the configuration file by the user.

Key	Action
Left or **On/Off**	Exit / Abort

10.4.6. Firmware_flash

[Warning: Image ignored]
Firmware_flash

Use when flashing Rockbox (see section **??** (page **??**). In the ideal case, you'll need this tool only once. For safety reasons you may wish to delete **firmware_flash.rock** from **/.rockbox/rocks** once flashing is complete.

10.4.7. Keybox

Keybox is an encrypted password storage using the "Tiny Encryption Algorithm" with a key derived using md5.

Using Keybox

To get started, start up the plugin and select Enter Keybox. The first time you enter Keybox you will be prompted for a master password and for confirmation of the master password. The master password is the password that you must use to access your stored passwords.

Once inside, enter the context menu by pressing Long **Right**. From the context menu you can create new entries, delete entries and edit entries. Each entry has a "title", a "user name" and a "password".

Selecting Reset Keybox from the main menu will delete the current list of passwords and a new, empty list will be created the next time you select Enter Keybox after prompting for a new master password. Entries are automatically saved when the plugin is exited.

10.4.8. Lrcplayer

This plugin displays lyrics in `.lrc` files (and some other formats) synchronized with the song being played.

Supported file types

1. `.lrc`
2. `.lrc8`
3. `.snc`
4. `.txt`

5. id3v2 SYLT or USLT tags in mp3 files

`.lrc8` files are the same as `.lrc` files except that they are UTF8 encoded. The Lyrics3 tag is not supported.

Supported tags and formats for `.lrc` files

The following tags are supported:

```
[ti:title]
[ar:artist]
[offset:offset (msec)]
```

Each line should resemble one of the following:

```
[time tag]line
[time tag]...[time tag]line
[time tag]<word time tag>word<word time tag>...<word time tag>
```

The time tag must be in the form [mm:ss], [mm:ss.xx], or [mm:ss.xxx] where mm is minutes, ss is seconds, xx is tenth of milliseconds, and xxx is milliseconds. Any other tags and lines without time tags are ignored.

Location of lyrics files

The plugin checks the following directories for lyrics files.

1. The directory containing the audio file and its parent directories.
2. For each of the above directories, the plugin searches for a subdirectory named "Lyrics".
3. Finally, the plugin will search as above, but within a directory called "/Lyrics". The name of this directory can be customized, see below.

If the audio file currently playing is `/Music/Artist/Album/Title.mp3`, then the following files will be searched for, in this order. `.ext` is one of the supported extensions from the list above, and will be searched for in the same order as in that list.

```
/Music/Artist/Album/Title.ext
/Music/Artist/Title.ext
/Music/Title.ext
/Title.ext
/Music/Artist/Album/Lyrics/Title.ext
/Music/Artist/Lyrics/Title.ext
/Music/Lyrics/Title.ext
/Lyrics/Title.ext
```

```
/Lyrics/Musics/Artist/Album/Title.ext
/Lyrics/Musics/Artist/Title.ext
/Lyrics/Musics/Title.ext
/Lyrics/Title.ext
```

Controls

Key	Action
Up / **Down**	Volume up/down.
Left	Go to beginning of track, or if pressed while in the first seconds of a track, go to the previous track.
Long **Left**	Rewind in track.
Right	Go to the next track.
Long **Right**	Fast forward in track.
On/Off	Toggle play/pause.
Long **On/Off**	Exit the plugin.
Long **Mode**	Enter timetag editor.
Mode	Enter Lrcplayer Menu.

Lrcplayer Menu

Theme settings. Change theme related settings.

- **Show Statusbar.** Show / hide the statusbar.
- **Display Title.** Show / hide the track title.
- **Display Time.** Show / hide the current time.
- **Backlight Force On.** Do not turn off the backlight while displaying the lyrics.

Display Settings. Change how the lyrics are displayed.

- **Wrap.** Breaks lines at white space.
- **Wipe.** Wipes the text.
- **Alignment.** Align text to the left, centre, or right.
- **Activate Only Current Line.** Activate only the current line, or the current and previous lines.

Lyrics Settings. Change how the lyrics files are loaded.

- **Encoding.** Sets the codepage used in the plugin.

Lrc Directory. Set the directory where lyrics files are stored, must be a maximum of 63 bytes.

Playback Control. Show the playback control menu.

Time Offset. Set an offset for the time tags for the lyrics currently in use.

Timetag Editor. Enter the timetag editor.

Quit. Exit the plugin.

Editing the time tags

The display time for each line can be changed with the timetag editor. Selecting a line changes its time to the current position of the track. To set a specific time or to adjust the time, press Long **Right** to bring up a screen to adjust the time. Changes will be saved automatically when the song is changed. Editing words in lyrics is not supported.

10.4.9. Main Menu Configuration

This plugin helps you customizing the main menu (i.e. reorder or hide menu items). It changes the appropriate configuration file as described in section 11.1.1 (page 130).

When you start the plugin, the available main menu items will be displayed. By pressing **Right** you open a menu with the following options:

Toggle Item Hide the selected menu item or make it visible again

Move Item Up Swap the selected menu item with the previous one

Move Item down Swap the selected menu item with the next one

Load Default Configuration Discards all customization

Exit Save your changes to the configuration file and exit the plugin

You can leave the plugin without saving by pressing **Left** or **On/Off**.

10.4.10. md5sum

Open a file, a directory or just launch it from the plugin menu to create an md5sum of the file, the directory's contents or the whole filesystem. If the file's extension is `.md5` or `.md5sum`, it will check the md5 sums in the file instead. If the file's extension is .md5list it will compute md5 sums for all the files listed.

10.4.11. Metronome

This plugin can be used as a metronome to keep time during music practice. It supports two modes of operation, depending on it being started from the plugin menu or as viewer for tempomap (`.tempo`) files.

The sound is a piercing square wave that can be heard well also through loud music from a band. In addition, the display also indicates the beats while playing so that you can discreetly place the device in your sight for checking the tempo instead of wearing headphones at a concert.

Simple Interactive Mode

This is the mode of operation that is active when starting the plugin directly from the menu. It offers a uniform metronome sound at a constant tempo. You can adjust the tempo through the interface or by tapping it out on the appropriate button.

Key	Action
Long **On/Off**	Exit plugin
On/Off	Stop
Long **Mode**	Start
Mode	Tap tempo
Left / **Right**	Adjust tempo
Up / **Down**	Adjust volume

Programmed Track Mode

When starting the plugin as a viewer for tempomap files (ending in `.tempo`), it starts in the track mode that offers playback of a preprogrammed metronome track consisting out of multiple parts, each with possibly different properties.

In contrast to the simple mode, there exists the notion of meter and bars, along with emphasis on certain beats. Parts can have these properties:

- finite or infinite duration in bars (navigation only jumps to the beginning of infinite parts),
- differing meters (4/4, 3/4, 6/8, etc., default 4/4),
- differing tempo (always in quarter beats per minute, default 120) with
  - one tempo per bar or even one tempo per beat, or
  - smooth tempo changes with configurable acceleration, and
- custom beat patterns (tick/tock/silence on each beat), default being emphasis (tick) on first beat, normal sound (tock) on others.

The button mapping is different to enable navigation in the programmed track.

Key	Action
Long **On/Off**	Exit plugin
On/Off	Stop (stay at position)
Mode	Start from / Stop at current position
Left / Right	Seek in track
Up / Down	Adjust volume

Navigation The display indicates the part properties and position in track as such:

```
Metronome Track
---------------
   "Interlude"
3/4@120 V-25
P2/13: B1/5+2
```

In this example, the part label is "Interlude", the meter is 3/4 and the tempo 120 quarter beats per minute (bpm). The volume setting is at -25 and this is the second part of a track with 13 total. In that part, the position is at the second beat of the first bar of five.

The syntax of programmed tracks in tempomap files follows the format defined by http://das.nasophon.de/klick/. Actually, the goal is to keep compatibility between klick and this Rockbox metronome. The parts of a track are specified one line each in this scheme (pieces in [] optional):

```
[name:] bars [meter ]tempo[-tempo2[*accel|/accel] [pattern] [volume]
```

The bar count and tempo always have to be specified, the rest is optional.

One example is

```
part I: 12 3/4 133
```

for a part named "part I" , 12 bars long, in 3/4 meter with a tempo of 133 quarter beats per minute. Tempo changes are indicated by specifying a tempo range and the acceleration in one of these ways:

```
0 4/4 90-150*0.25
0 4/4 150-90/4
16 4/4 100-200
```

The first one goes from 90 to 150 bpm in an endless part with 0.25 bpm increase per bar. The second one goes down from 150 to 90 with 4 bars per bpm change, which is the same acceleration as in the first line. The last one is a part of 16 bars length that changes tempo from 100 to 200 smoothly during its whole lifetime (6.25 bpm/bar). For details on how the acceleration works, see http://thomas.orgis.org/science/metronome-tempomath/tempomath.html.

It is also possible to provide a tempo for each individual beat in a part by separating values with a comma (no spaces),

```
varibeat: 3 4/4 135,90,78,100,120,120,99,100,43,94,120,133
```

where the beat duration is first according to 135 bpm, then 90 bpm, and so forth. You are required to provide a value for each beat in all bars of the part.

You can provide a pattern that controls how the beats are played:

Symbol	Meaning
X	emphasized beat (Tick)
x	normal beat (Tock)
.	silent beat

Some examples:

```
default: 0 4/4 120 Xxxx
rockon2: 0 4/4 120 xXxX
  solea: 0 12/4 180 xxXxxXxXxXxX
shuffle: 0 12/12 120 x.xX.xx.xX..
  funky: 0 16/16 120 x.x.X..X.Xx.X..X
```

The 12/12 for the shuffle create 1/4 triplets. Just do a bit of math;-) This is still a metronome, not a drum machine, but it can act like a basic one, helping you to figure out a certain rhythm within the meter.

The UI is developed so that it fits into the display of a Sansa Clip+ and that is the hardware device it is tested on. It seems to work reasonably on some other models in the simulator.

At last, a more complete tempomap file:

```
# An example track exercising the programmable Rockbox metronome
# or also http://das.nasophon.de/klick/.
     lead-in: 1 4/4 120 XXXX 0.5 # 4 emphasized but less loud ticks
       intro: 4 4/4 120          # standard beat
tearing down: 4     120-90       # changing tempo from 120 to 90
       break: 2 1/4 90           # 2 1/4 bars at 90
     rolling: 2 6/8 90           # 2 6/8 at same tempo (quarters!)
    rumbling: 4 3/4 90 X.x       # 3/4, first (tick) and last (tock)
     ramp-up: 8 2/4 90-150       # speeding up to 150 bpm again
        flow: 4     150          # steady 4/4 at 150 bpm
       death: 8     150-60       # going down to 60
       final: 1 1/1 60           # one last hit
```

10.4.12. One-Time Password Client

This plugin provides the ability to generate one-time passwords (OTPs) for authentication purposes. It implements an HMAC-based One-Time Password Algorithm (RFC 4226), and on targets which support it, a Time-based One-Time Password Algorithm (RFC 6238).

Adding Accounts

The plugin supports two methods of adding accounts: URI import, and manual entry.

URI Import

This method of adding an account reads a list of URIs from a file. It expects each URI to be on a line by itself in the following format:

```
otpauth://[hotp OR totp]/[account name]?secret=[Base32 secret][&counter=X][&period=X][&d
```

An example is shown below, provisioning a TOTP key for an account called "bob":

```
otpauth://totp/bob?secret=JBSWY3DPEHPK3PXP
```

Any other URI options are not supported and will be ignored.

Most services will provide a scannable QR code that encodes a OTP URI. In order to use those, first scan the QR code separately and save the URI to a file on your device. If necessary, rewrite the URI so it is in the format shown above. For example, GitHub's URI has a slash after the provider. In order for this URI to be properly parsed, you must rewrite the account name so that it does not contain a slash.

Manual Import

If direct URI import is not possible, the plugin supports the manual entry of data associated with an account. After you select the "Manual Entry" option, it will prompt you for an account name. You may type anything you wish, but it should be memorable. It will then prompt you for the Base32-encoded secret. Most services will provide this to you directly, but some may only provide you with a QR code. In these cases, you must scan the QR code separately, and then enter the string following the "secret=" parameter on your Rockbox device manually.

On devices with a real-time clock, the plugin will ask whether the account is a time-based account (TOTP). However, if your device lacks a real-time clock, the plugin's functionality will be restricted to HMAC-based (HOTP) accounts only. If this is the case, the plugin will prompt you for information regarding the HOTP setup.

10.4.13. Periodic Table

The periodic table plugin allows easy browsing and viewing of details of elements, giving a detailed output for each selection. Navigate the table using the directional keys, pressing back or exit exits the plugin.

Key	Action
Up, **Down**, **Left**, **Right**	Move cursor
On/Off	Quit

10.4.14. Random Folder Advance Configuration

This plugin is used to configure the folders which will be considered when the Auto-Change Directory feature is set to Random.

Menu

Generate Folder List Generates a list of all folders found on the player. You can filter the directories which are scanned by creating a file called `/.rockbox/folder_advance_dir.txt`. Only the directories in this file and any contained directories will be scanned. You can have up to 10 directories ignored by the scan by placing a minus sign before them in the list (i.e. `-/CDs` will cause everything in the `/CDs` directory to be ignored.). If you just want `/CDs` to be ignored but want to include the folders within it you need to have both `-/CDs` and `CDs` as entries.

Edit Folder List Enter the folder list editor

Export List To Textfile Exports the list to `/.rockbox/folder_advance_list.txt`

Import List From Textfile Imports the list from `/.rockbox/folder_advance_list.txt`

Play Shuffled Starts playback with the selected directories in random order. Tracks within a directory will be played in normal order. The plugin will exit after starting playback.

Quit

Folder List Editor Keys

Key	Action
Right	Delete selected folder
Long **Right**	Bring up the context menu which allows you to remove the selected folder or its entire folder tree
Left or **On/Off**	Exit

10.4.15. Resistor Calculator

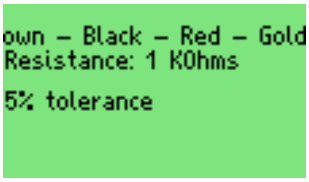

Figure 10.48.: Resistor calculator

The resistor calculator is a plugin that works in 3 modes:

Colour to Resistance

In Colour to Resistance mode, use the menus to select the colours of the bands of a resistor which you would like to know the resistance of.

Resistance to Colour

In Resistance to Colour mode, use the menus to select the unit that you would like to use (choose from Ohms, Kiloohms, Megaohms), and use the on-screen keyboard to input the value of the resistor that you would like to know the colour code of. The colour codes are presented textually.

LED resistance

LED resistance calculator is used to determine the resistor necessary to light an LED safely at a given voltage. First, select the voltage that the LED will use (the first option is the most common and a safe bet), and the current that it will draw (likewise with the first option). Then, use the onscreen keyboard to type in the supply voltage and, if selected, the custom forward current. This function produces safe estimates, but use your own judgement when using these output values. Power rating and displayed resistance are rounded up to the nearest common value.

10.4.16. Split Editor

When recording an mp3 file, it is common practice to start the recording a little bit early and stop it a little bit late to ensure all the desired sound is recorded. This results in recordings that contain extra snippets of sound in the beginning and the end. Unfortunately these snippets can not be deleted easily because they are stored in the same file as the desired recording. The purpose of the split editor is to split an mp3 file (the input file) at a point in time (split point). Two new files can be generated from the input file. The first file contains the part before the split point and the second file contains the part after the split point. Once this process has been successful the original file can be deleted or kept as a backup. The whole process of splitting an mp3 file consists of three steps:

- Defining the split point
- Generating the result files
- If desired deleting the input file (with the browser, not the split editor)

How To Use The Split Editor

When the device plays the song just hit the **On/Off** button to pause, when playback has roughly reached the split point. This need not be very precise as the split point can be fine tuned later. A screen similar to the one below will appear.

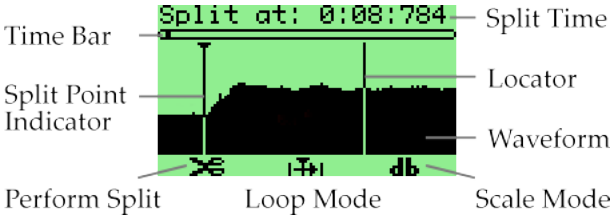

Figure 10.49.: The Split Editor's Main Screen

The Split Editor's Main Screen

The waveform displays the volume of the song over time. It will appear as the song plays and help to visually identify the point in time where the split is desired

The split point indicator is a vertical line with a small triangle at the top end. It is the most important control element of the split editor. It can be moved with the **Left** and **Right** buttons. Later, when you have fine tuned the split point, the song will be split at this position.

The split time At the top of the window a time value is displayed. This is the point in time within the song at which the split point indicator is positioned.

The locator Another vertical bar represents the position locator. It moves along as the song plays. In contrast to the split point indicator it has no triangles at the ends.

The time bar displays the current position within the song relative to the whole song. The entire length of the time bar represents the song length. The length of the solid part of the time bar represents the position and length of the displayed part of the song.

The scale mode On the right side of the bottom line the scale mode is displayed. The waveform can be scaled either logarithmically or linearly. In logarithmic scale mode the letters "dB" are displayed, in linear mode "%". Use **Mode** + **Right** to switch between these modes. Linear mode usually gives better optical hints with commercially recorded music. For quiet recordings, especially of human speech, the logarithmic scale often is preferable. More information in the Scale section 10.4.16 (page 128) below.

The loop mode In the middle of the bottom line the loop mode icon is displayed. There are 4 different loop modes. Pressing **Mode** + **Up** changes to the next loop mode.

- Playback loops around the split point indicator. This mode is best used when searching and zooming for the desired point at which to split the recording.
- Playback loops from the split point indicator to the end of the visible area. This mode is best used when fine tuning the split indicator position at the beginning of a recording.
- Playback loops from the beginning of the visible area to the split point. This mode is best used when fine tuning the split indicator position at the end of a recording.
- Playback does not loop, the borders of the visible area as well as the split point indicator are ignored. This mode is best used when playing the song outside of the borders of the displayed region.

Perform the split (8) The icon above the **Left** button indicates its function to execute the split. When split positioning is complete open the save dialogue with **Mode** + **Left**.

Key	Action
On/Off	Quit plugin
Left / Right	Move the split point indicator
Up / Down	Zoom in / out
Mode	Play from the split position
Mode + Left	Enter the save dialogue
Mode + Up	Toggle loop modes
Mode + Right	Toggle logarithmic / linear scaling

Table 10.1.: Controls in the split editor

Save dialogue

In the save dialogue it is possible to specify which of the files you want to save and their names. When finished, select "Save" and the files will be written to disk. Note that files can not be overwritten, so filenames that do not exist yet must be chosen. If unsure whether the file already exists simply try to save it. If another file with this name exists the dialogue will return and you can choose another filename

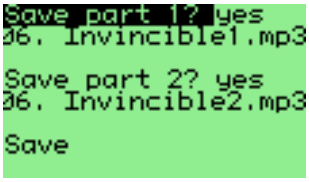

Figure 10.50.: The Split Editor's Save Dialogue

Key	Action
Up / Down	Select item
Right	Toggle / edit item
On/Off	Cancel

Table 10.2.: Controls in the save dialogue

Scale

The values in the waveform are scaled according to the settings of the peak meter. These can be altered in the peak meter settings, see section 8.4 (page 52). If extreme minimum or maximum values are set the waveform might be cut off. A minimum setting of -60 dB and a maximum setting of 0 dB are recommended. These settings should be capable of producing useful waveforms for very soft sounds in logarithmic mode (dB). When the editor is used on loud sounds (such as commercial rock or pop music) switching to the linear scale may prove more effective since the logarithmic scale compresses loud noises and makes it more difficult to identify characteristic shapes. Note that it is always possible to toggle between the two scale modes.

10.4.17. Stats

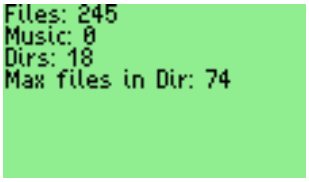

Figure 10.51.: The stats-plugin

The stats plugin counts the directories and files (the total number as well as the number of audio, playlist, image and video files) on your player. Press **On/Off** or Long **On/Off** to abort counting and exit the plugin. Press it again to quit after counting has finished.

10.4.18. Stopwatch

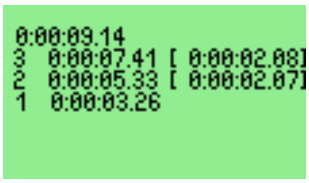

Figure 10.52.: Stopwatch

A simple stopwatch program with support for saving times.

Key	Action
On/Off	Quit Plugin
Right	Start / stop
Left	Reset timer (only when timer is stopped)
Mode	Take lap time
Up / Down	Scroll through lap times

10.4.19. Text Editor

This plugin allows you to view and edit simple text documents on your DAP. You can view files by using Open with from the Context Menu (see section 4.1.2 (page 21)).

Usage

If you start the Text Editor from the plugin browser you will be greeted with a blank screen. When started from the Open with menu item your file should be shown on the screen. You can now edit the file. The Text Editor is line based. This means you can edit one line at a time using the Virtual Keyboard (see section 4.1.3 (page 23)).

- Move the selection bar to the line you want to edit.
- Edit the highlighted text line or insert a new one using the Item Menu.
- When finished editing exit the Text Editor. You'll be shown a list of save options.

Note: When you have not changed the file the Text Editor will quit immediately.

Key	Action
Right	Edit Line / Select Character
Left or **On/Off**	Exit / Abort Editing
Long **Mode**	Show Item Menu
Long **Right**	Delete Line

11. Advanced Topics

11.1. Customising the User Interface

11.1.1. Customising The Main Menu

It is possible to customise the main menu, i.e. to reorder or to hide some of its items (only the main menu can be customised, submenus can not). To accomplish this, load a `.cfg` file (as described in section 11.3 (page 137)) containing the following line: `root menu order:items`, where "items" is a comma separated list (no spaces around the commas!) of the following words: `bookmarks`, `files`, `database`, `wps`, `settings`, `playlists`, `plugins`, `system_menu`, `shortcuts`. Each of the words, if it occurs in the list, activates the appropriate item in the main menu. The order of the items is given by the order of the words in the list. The items whose words do not occur in the list will be hidden, with one exception: the menu item Settings will be shown even if its word is not in the list (it is added as the last item then).

The following configuration example will change the main menu so that it will contain only the items for the file browser, for resuming the playback, and for changing the settings (the latter will be added automatically).

Example

```
root menu order:files,wps
```

To reset the menu items to the default, use `root menu order:-` (i.e. use a hyphen instead of "items").

This configuration entry can only be created and edited with a text editor or the Main Menu Config Plugin (see section 10.4.9 (page 118)). It is not possible to change this setting via the settings menu.

11.1.2. Getting Extras

Rockbox supports custom fonts. A collection of fonts is available for download in the font package at http://www.rockbox.org/daily.shtml.

11.1.3. Loading Fonts

Rockbox can load fonts dynamically. Simply copy the `.fnt` file to the player and "play" it in the File Browser. If you want a font to be loaded automatically every time you start up, it must be located in the `/.rockbox/fonts` directory and the filename must be at most 24 characters long. You can browse the fonts in `/.rockbox/fonts` under

Settings → Theme Settings → Font in the Main Menu.

Note: Advanced Users Only: Any BDF font should be usable with Rockbox. To convert from `.bdf` to `.fnt`, use the `convbdf` tool. This tool can be found in the `tools` directory of the Rockbox source code. See ☞CreateFonts#ConvBdf for more details. Or just run `convbdf` without any parameters to see the possible options.

11.1.4. Loading Languages

Rockbox can load language files at runtime. Simply copy the `.lng` file *(do not use the .lang file)* to the player and "play" it in the Rockbox directory browser or select Settings → General Settings → Language from the Main Menu.

Note: If you want a language to be loaded automatically every time you start up, it must be located in the `/.rockbox/langs` directory and the filename must be a maximum of 24 characters long.

If your language is not yet supported and you want to write your own language file find the instructions on the Rockbox website: ☞LangFiles

11.1.5. UI Viewport

By default, the UI is drawn on the whole screen. This can be changed so that the UI is confined to a specific area of the screen, by use of a UI viewport. This is done by adding the following line to the `.cfg` file for a theme:

```
ui viewport:  X,Y,[width],[height],[font]
```

Only the first two parameters *have* to be specified, the others can be omitted using '–' as a placeholder. The syntax is very similar to WPS viewports (see section 11.2.2 (page 133)). Briefly:

- 'font' is a number: 0 is the built-in system font, 1 is the user-selected font.

Example

```
ui viewport: 15,20,100,150,-
```

This displays the menu starting at 15px from the left of the screen and 20px from the top of the screen. It is 100px wide and 150px high. The font is defined in the theme `.cfg` file or in the Theme Settings menu.

11.2. Configuring the Theme

11.2.1. Themeing – General Info

There are various different aspects of the Rockbox interface that can be themed – the WPS or While Playing Screen, the FMS or FM Screen (if the player has a tuner), and the SBS or Base Skin. The WPS is the name used to describe the information displayed on the player's screen whilst an audio track is being played, the FMS is the screen shown while listening to the radio, and the SBS lets you specify a base skin that is shown in the menus and browsers, as well as the WPS and FMS. The SBS also allows you to control certain aspects of the appearance of the menus/browsers. There are a number of themes included in Rockbox, and you can load one of these at any time by selecting it in Settings → Theme Settings → Browse Theme Files. It is also possible to set individual items of a theme from within the Settings → Theme Settings menu.

11.2.2. Themes – Create Your Own

The theme files are simple text files, and can be created (or edited) in your favourite text editor. To make sure non-English characters display correctly in your theme you must save the theme files with UTF-8 character encoding. This can be done in most editors, for example Notepad in Windows 2000 or XP (but not in 9x/ME) can do this.

Files Locations: Each different "themeable" aspect requires its own file – WPS files have the extension `.wps`, FM screen files have the extension `.fms`, and SBS files have the extension `.sbs`. The main theme file has the extension `.cfg`. All files should have the same name.

The theme `.cfg` file should be placed in the `/.rockbox/themes` directory, while the `.wps`, `.fms` and `.sbs` files should be placed in the `/.rockbox/wps` directory. Any images used by the theme should be placed in a subdirectory of `/.rockbox/wps` with the same name as the theme, e.g. if the theme files are named `mytheme.wps`, `mytheme.sbs` etc., then the images should be placed in `/.rockbox/wps/mytheme`.

All full list of the available tags are given in appendix section C (page 147); some of the more powerful concepts in theme design are discussed below.

- All characters not preceded by % are displayed as typed.
- Lines beginning with # are comments and will be ignored.

Note: Keep in mind that your player's resolution is 112×64×1 (with the last number giving the colour depth in bits) when designing your own WPS, or if you use a WPS designed for another target.

Viewports

By default, a viewport filling the whole screen contains all the elements defined in each theme file. The text is rendered in the same font as in the main menu. To change this behaviour a custom viewport can be defined. A viewport is a rectangular window on the screen. This window also has variable dimensions. To define a viewport a line starting `%V(...` has to be present in the theme file. The full syntax will be explained later in this section. All elements placed before the line defining a viewport are displayed in the default viewport. Elements defined after a viewport declaration are drawn within that viewport. Loading images (see Appendix section C.20 (page 155)) should be done within the default viewport. A viewport ends either with the end of the file, or with the next viewport declaration line. Viewports sharing the same coordinates and dimensions cannot be displayed at the same time. Viewports cannot be layered *transparently* over one another. Subsequent viewports will be drawn over any other viewports already drawn onto that area of the screen.

Viewport Declaration Syntax

`%V(x,y,[width],[height],[font]`

- 'font' is a number: 0 is the built-in system font, 1 is the current menu font, and 2-9 are additional skin loaded fonts (see section 11.2.4 (page 134)).
- Only the coordinates *have* to be specified. Leaving the other definitions blank will set them to their default values.

Note: The correct number of commas with hyphens in blank fields are still needed.

Example

```
%V(12,20,-,-,1)
%sThis viewport is displayed permanently. It starts 12px from the left and
%s20px from the top of the screen, and fills the rest of the screen from
%sthat point. The lines will scroll if this text does not fit in the viewport.
%sThe user font is used.
```

Viewport definition	Default value
width/height	remaining part of screen
font	user defined

Conditional Viewports

Any viewport can be displayed either permanently or conditionally. Defining a viewport as `%V(...` will display it permanently.

- `%Vl('identifier',...)` This tag preloads a viewport for later display. 'identifier' is a single lowercase letter (a-z) and the '...' parameters use the same logic as the `%V` tag explained above.

- `%Vd('identifier')` Display the 'identifier' viewport.

Viewports can share identifiers so that you can display multiple viewports with one %Vd line.

Example

```
%?mh<%Vd(a)|%Vd(b)>
%Vl(a,10,10,50,50,-)
%sYou could now show a hold icon using the %%xl and %%xd tags.
%Vl(a,0,70,70,14,1)
%s%acYour DAP is locked.
%Vl(b,20,14,50,14,1)
%t(1)%acWarning:;%t(.1)
%Vl(b,20,30,50,50,0)
%sYou've unlocked your player.
```

This example checks for hold. Viewport 'a' will be displayed if it is on, otherwise viewport 'b' will display a flashing warning.

Note: The tag to display conditional viewports must come before the tag to preload the viewport in the `.wps` file.

11.2.3. Info Viewport (SBS only)

As mentioned above, it is possible to set a UI viewport via the theme `.cfg` file. It is also possible to set the UI viewport through the SBS file, and to conditionally select different UI viewports.

- `%Vi('label',...)` This viewport is used as Custom UI Viewport in the case that the theme doesn't have a ui viewport set in the theme `.cfg` file. Having this is strongly recommended since it makes you able to use the SBS with other themes. If label is set this viewport can be selectivly used as the Info Viewport using the %VI tag. The '...' parameters use the same logic as the `%V` tag explained above.
- `%VI('label')` Set the Info Viewport to use the viewport called label, as declared with the previous tag.

11.2.4. Additional Fonts

Additional fonts can be loaded within each screen file to be used in that screen. In this way not only can you have different fonts between e.g. the menu and the WPS, but you can use multiple fonts in each of the individual screens.

`%Fl('id',filename,glyphs)`

- 'id' is the number you want to use in viewport declarations, 0 and 1 are reserved and so can't be used.

- 'filename' is the font filename to load. Fonts should be stored in `/.rockbox/fonts/`
- 'glyphs' is an optional specification of how many unique glyphs to store in memory. Default is from the system setting Glyphs To Load.

An example would be: `%Fl(2,12-Nimbus.fnt,100)`

Conditional Tags

If/else: Syntax: `%?xx<true|false>`

If the tag specified by "`xx`" has a value, the text between the "`<`" and the "`|`" is displayed (the true part), else the text between the "`|`" and the "`>`" is displayed (the false part). The else part is optional, so the "`|`" does not have to be specified if no else part is desired. The conditionals nest, so the text in the if and else part can contain all `%` commands, including conditionals.

Enumerations: Syntax: `%?xx<alt1|alt2|alt3|...|else>`

For tags with multiple values, like Play status, the conditional can hold a list of alternatives, one for each value the tag can have. Example enumeration:

Example

```
%?mp<Stop|Play|Pause|Ffwd|Rew>
```

The last else part is optional, and will be displayed if the tag has no value. The WPS parser will always display the last part if the tag has no value, or if the list of alternatives is too short.

Next Song Info

You can display information about the next song – the song that is about to play after the one currently playing (unless you change the plan).

If you use the upper-case versions of the three tags: `F`, `I` and `D`, they will instead refer to the next song instead of the current one. Example: `%Ig` is the genre name used in the next song and `%Ff` is the mp3 frequency.

Note: The next song information *will not* be available at all times, but will most likely be available at the end of a song. We suggest you use the conditional display tag a lot when displaying information about the next song!

Alternating Sublines

It is possible to group items on each line into 2 or more groups or "sublines". Each subline will be displayed in succession on the line for a specified time, alternating continuously through each defined subline.

Items on a line are broken into sublines with the semicolon '`;`' character. The display time for each subline defaults to 2 seconds unless modified by using the '`%t`' tag to

specify an alternate time (in seconds and optional tenths of a second) for the subline to be displayed.

Subline related special characters and tags:

; Split items on a line into separate sublines

%t Set the subline display time. The '%t' is followed by either integer seconds (%t5), or seconds and tenths of a second within () e.g. (%t(3.5)).

Each alternating subline can still be optionally scrolled while it is being displayed, and scrollable formats can be displayed on the same line with non-scrollable formats (such as track elapsed time) as long as they are separated into different sublines. Example subline definition:

Example

```
%s%t(4)%ia;%s%it;%t(3)%pc %pr : Display id3 artist for 4 seconds,
                                Display id3 title for 2 seconds,
                                Display current and remaining track time
                                for 3 seconds,
                                repeat...
```

Conditionals can be used with sublines to display a different set and/or number of sublines on the line depending on the evaluation of the conditional. Example subline with conditionals:

Example

```
%?it<%t(8)%s%it|%s%fn>;%?ia<%t(3)%s%ia|%t(0)>
```

The format above will do two different things depending if ID3 tags are present. If the ID3 artist and title are present:

- Display id3 title for 8 seconds,
- Display id3 artist for 3 seconds,
- repeat...

If the ID3 artist and title are not present:

- Display the filename continuously.

Note that by using a subline display time of 0 in one branch of a conditional, a subline can be skipped (not displayed) when that condition is met.

Using Images

You can have as many as 52 images in your WPS. There are various ways of displaying images:

1. Load and always show the image, using the %x tag

2. Preload the image with `%xl` and show it with `%xd`. This way you can have your images displayed conditionally.

Example on bitmap preloading and use:

Example

```
%x(a,static_icon.bmp,50,50)
%xl(b,rep_off.bmp,16,64)
%xl(c,rep_all.bmp,16,64)
%xl(d,rep_one.bmp,16,64)
%xl(e,rep_shuffle.bmp,16,64)
%?mm<%xd(b)|%xd(c)|%xd(d)|%xd(e)>
```

Four images at the same x and y position are preloaded in the example. Which image to display is determined by the `%mm` tag (the repeat mode).

Example File

Example

```
%s%?in<%in - >%?it<%it|%fn> %?ia<[%ia%?id<, %id>]>
%pb%pc/%pt
```

That is, "tracknum – title [artist, album]", where most fields are only displayed if available. Could also be rendered as "filename" or "tracknum – title [artist]".

11.3. Managing Rockbox Settings

11.3.1. Introduction to `.cfg` Files

Rockbox allows users to store and load multiple settings through the use of configuration files. A configuration file is simply a text file with the extension `.cfg`.

A configuration file may reside anywhere on the disk. Multiple configuration files are permitted. So, for example, you could have a `car.cfg` file for the settings that you use while playing your jukebox in your car, and a `headphones.cfg` file to store the settings that you use while listening to your player through headphones.

See section 11.3.2 (page 137) below for an explanation of the format for configuration files. See section 11.3.3 (page 138) for an explanation of how to create, edit and load configuration files.

11.3.2. Specifications for `.cfg` Files

The Rockbox configuration file is a plain text file, so once you use the Save .cfg file option to create the file, you can edit the file on your computer using any text editor program. See Appendix section D (page 161) for available settings. Configuration files use the following formatting rules:

1. Each setting must be on a separate line.

2. Each line has the format "setting: value".
3. Values must be within the ranges specified in this manual for each setting.
4. Lines starting with # are ignored. This lets you write comments into your configuration files.

Example of a configuration file:

Example

```
volume: 70
bass: 11
treble: 12
balance: 0
time format: 12hour
volume display: numeric
show files: supported
wps: /.rockbox/car.wps
lang: /.rockbox/afrikaans.lng
```

Note: As you can see from the example, configuration files do not need to contain all of the Rockbox options. You can create configuration files that change only certain settings. So, for example, suppose you typically use the player at one volume in the car, and another when using headphones. Further, suppose you like to use an inverse LCD when you are in the car, and a regular LCD setting when you are using headphones. You could create configuration files that control only the volume and LCD settings. Create a few different files with different settings, give each file a different name (such as `car.cfg`, `headphones.cfg`, etc.), and you can then use the Browse .cfg files option to quickly change settings.

A special case configuration file can be used to force a particular setting or settings every time Rockbox starts up (e.g. to set the volume to a safe level). Format a new configuration file as above with the required setting(s) and save it into the `/.rockbox` directory with the filename `fixed.cfg`.

11.3.3. The Manage Settings menu

The Manage Settings menu can be found in the Main Menu. The Manage Settings menu allows you to save and load `.cfg` files.

Browse .cfg Files Opens the File Browser in the `/.rockbox` directory and displays all `.cfg` (configuration) files. Selecting a `.cfg` file will cause Rockbox to load the settings contained in that file. Pressing **Left** or **On/Off** will exit back to the Manage Settings menu. See the Write .cfg files option on the Manage Settings menu for details of how to save and edit a configuration file.

Reset Settings This wipes the saved settings in the player and resets all settings to their default values.

Save .cfg File This option writes a `.cfg` file to your player's disk. The configuration file has the `.cfg` extension and is used to store all of the user settings that are described throughout this manual.

Hint: Use the Save .cfg File feature (Main Menu → Manage Settings) to save the current settings, then use a text editor to customize the settings file. See Appendix section D (page 161) for the full reference of available options.

Save Sound Settings This option writes a `.cfg` file to your player's disk. The configuration file has the `.cfg` extension and is used to store all of the sound related settings.

Save Theme Settings This option writes a `.cfg` file to your player's disk. The configuration file has the `.cfg` extension and is used to store all of the theme related settings.

11.4. Firmware Loading

When your player powers on, it loads the Archos firmware in ROM, which automatically checks your player's root directory for a file named `ajbrec.ajz`. Note that Archos firmware can only read the first ten characters of each filename in this process, so do not rename your old firmware files with names like `ajbrec.ajz.old` and so on, because it is possible that the player will load a file other than the one you intended.

11.4.1. Using ROLO (Rockbox Loader)

Rockbox is able to load and start another firmware file without rebooting. You just "play" a file with the extension `.ajz`. This can be used to test new firmware versions without deleting your current version.

11.5. Rockbox in Flash

11.5.1. Introduction

When you bought your Ondio, it came with the Archos firmware in flash ROM. When you power on your player, this Archos firmware starts, and then loads an updated firmware from disk if present (`ajbrec.ajz`). An ordinary Rockbox installation only replaces the on-disk firmware, leaving the flash ROM contents intact. That means the Archos firmware still controls the boot process.

The main reason to change this is to improve the startup time of your player. The Archos bootloader is rather slow. With Rockbox in flash, your player will boot much faster, typically in three to five seconds. Furthermore you might prefer a clean Rockbox environment, with as little remnants of the Archos software as possible. On your player it is also possible to execute Rockbox directly from flash ROM, increasing the amount of free RAM for buffering music. This is called *Rombox*.

Warning: Flashing your player is somewhat dangerous, like programming a mainboard *BIOS*, *CD/DVD* drive firmware, mobile phone, etc. If the power fails, the chip breaks while programming or most of all the programming software malfunctions, you'll have a dead box. We take no responsibility of any kind, you do that at your own risk. However, we tried as carefully as possible to bulletproof this code. There are a lot of sanity checks. If any of them fails, it will not program.

Warning: After flashing Rockbox, never try to ROLO the Archos firmware version 1.32b! This version is a flash update itself. If it is applied when Rockbox is flashed, you'll end up with a garbled flash ROM and hence a dead box.

There's an ultimate safety net to bring back boxes with even completely garbled flash content: the *UART* boot mod, which in turn requires the *serial* mod. With that it's possible to reflash independently from the outside, even if the flash ROM is completely erased. If the first ≈2 KB of the flash ROM are flashed OK, *Minimon* can be used for the same purpose.

11.5.2. Terminology and Basic Operation

Firmware: The flash ROM contents as a whole.

Image: One operating software started from there.

The replacement firmware contains a bootloader and two images. The first image is the *permanent* rescue software, to be used in case something is wrong with the second (main) image. In current firmware files this first image contains *Bootbox* (see wiki for details). The second image is what is booted by default. The current firmware files contain a copy of Rockbox 3.2 in the main image. It can easily be updated/replaced later.

The bootloader allows to select which image to run. Pressing **Left** at boot selects the first image. **Up** selects the second image, which will also be booted if you don't press any button. The button mapping is only there for completeness. **Right** selects the built-in serial monitor called *Minimon*. You should know this in case you invoke it by accident. Minimon won't display anything on the screen. To get out of it, perform a hardware shutdown of your player.

11.5.3. Initial Flashing Procedure

You only need to perform this procedure the first time you flash your Ondio. You may also want to perform it in case the update procedure for the second image recommends it. In the latter case do not perform the steps listed under "Preparation".

Preparation

You should perform a backup of the current flash ROM contents, in case you want to restore it later. Select System → Debug (Keep Out!) → Dump ROM contents. You'll notice a few seconds of disk activity. When you connect your player to the PC

afterwards, you'll find two files in the root of your player. Copy the 256 KB-sized file named `internal_rom_2000000-203FFFF.bin` to a safe place.

Flashing

1. Download the correct package for your player from http://download.rockbox.org/bootloader/archos/. It is named `flash-<model>-<version>.zip`. The current packages are v3.

2. Unzip the flash package to the root of your player. This will extract one file to the root, `firmware_<model>.bin`. Now safely disconnect USB.

3. Make sure you use a set of fresh batteries. Flashing doesn't need more power than normal operation, but you don't want your player to run out of power while flashing.

4. Select Plugins → Applications, and run the `firmware_flash` plugin. It will tell you about your flash and which file it is going to program. After pressing **Left** it will check the file. If the file is OK, pressing **Up** will give you a big warning. If we still didn't manage to scare you off, you need to press **Right** to actually program and verify. The programming takes just a few seconds.

5. In the unlikely event that the programming or verify steps should give you any error, *do not switch off the box!* Otherwise you'll have seen it working for the last time. While Rockbox is still in RAM and operational, we could upgrade the plugin via USB and try again. If you switch it off, it's gone.

Note: After successful flashing you may delete the `.bin` files from the root of your player.

Note: There are no separate flash packages for players modified to have 8 MB of RAM. You need to use the corresponding package for non-modified Ondio. You should then install a Rockbox image that makes use of all available RAM as described in the following section.

11.5.4. Updating the Rockbox Image in Flash

When Rockbox is booted from flash, it does not check for an updated firmware on disk. This is one of the reasons why it boots faster than the Archos firmware. It means that whenever you update Rockbox, you also need to update the image in the flash. This is a simple and safe procedure:

1. Download (or build) the Rockbox build you want to use, and unzip it to the root of your player. Safely disconnect USB.

2. ROLO into the new Rockbox version.

3. Go to the file browser, and enter the `.rockbox` directory (you might need to set the File View option to All.)
4. Play the file `rockbox.ucl`, or preferably `rombox.ucl`, and follow the instructions. The plugin handling this is `rockbox_flash`, a viewer plugin.

11.5.5. Restoring the Original Flash ROM Contents

In case you ever want to restore the original flash contents, you will need the backup file. The procedure is very similar to initial flashing, with the following differences:

1. Check that you do not have any `firmware_*.bin` files in your player's root.
2. Select Plugins → Applications, and run the `firmware_flash` plugin. Write down the filename it displays in the first screen, then exit the plugin.
3. Connect USB, and copy the flash ROM backup file to the root of your player. *Only use the backup file from that very box, otherwise you're asking for trouble!* Rename the file so that it matches the name requested by the `firmware_flash` plugin. Safely disconnect USB.

Now follow the instructions given for initial flashing, starting with step 3.

11.6. Optimising battery runtime

Rockbox offers a lot of settings that have high impact on the battery runtime of your player. The largest power savings can be achieved through disabling unneeded hardware components – for some of those there are settings available.

The following provides a short overview of the most relevant settings and rules of thumb.

11.6.1. Peak Meter

The peak meter is a feature of the While Playing Screen and will be updated with a high framerate. Depending on your player this might result in a high CPU load. To save battery runtime you should switch this feature off (see section 4.3.2 (page 28)).

11.6.2. Audio format and bitrate

Your target uses flash that consumes a certain amount of power during access. The less often the flash needs to be switched on for buffering and the shorter the buffering duration is, the lower is the overall power consumption. Therefore the bitrate of the audio files does have an impact on the battery runtime as well. Lower bitrate audio files will result in longer battery runtime.

Please do not re-encode any existing audio files from one lossy format to another based upon the above mentioned. This will reduce the audio quality. If you have the choice, select the best suiting codec when encoding the original source material.

A. File formats

A.1. Supported file formats

Icon	File Type	Extension	Action when selected
	Directory	*none*	Enter the directory
	Rockbox firmware	`.ajz`	Load the new firmware with ROLO
	Bookmark	`.bmark`	Display all bookmarks for an audio file
	Game of Life	`.cells`	Show the configuration with the "Rocklife" plugin
	Configuration File	`.cfg`	Load the settings file
	Chip8 game	`.ch8`	Play the Chip8 game
	Cuesheet	`.cue`	View the cuesheet file
	Font	`.fnt`	Change the user interface font to this one
	Image	`.jpg`	View the JPEG image
	Link	`.link`	Display list of target files and directories; selecting one jumps to the target. See section 10.3.1 (page 98).
	Language File	`.lng`	Load the language file
	Playlist	`.m3u`, `.m3u8`	Load the playlist and start playing the first file
	Audio file	`.mp2`, `.mp3`	Start playing the file and show the WPS
	Plugin	`.rock`	Start the plugin
	Rockbox Video	`.rvf`	View the movie (Rockbox format)
	Text File	`.txt`	Display the text file using the text viewer plugin
	Flash Image	`.ucl`	Flash the Rockbox image into the ROM
	Voice file	`.voice`	Allow Rockbox to speak menus
	Wave Audio File	`.wav`	Play the WAV file
	While Playing Screen	`.wps`	Load the new WPS display configuration

B. Album Art

Rockbox allows you to put the album art, or another image related to the music on your player to display it in the PictureFlow plugin. For this feature to work, there are a few requirements.

B.1. Limitations

Rockbox currently only supports loading images located on the flash storage for use in PictureFlow. The image files must be in either BMP or JPEG format. Rockbox does not support RLE-compressed BMP files, nor does it support progressive and multi-scan JPEG files. JPEG files must consist of a single scan with interleaved components, as progressive and multi-scan images require much more memory to decode.

B.2. Where to put album art

The pictures can be named a number of different ways, and placed to a number of different locations. You can have pictures specific to the file or the album or use a generic picture. You can place the picture in the same directory as the file, in the parent directory or in a fixed directory named `/.rockbox/albumart/`. The order Rockbox uses when looking for a picture is as follows (a list in braces means that those file extensions are tried in that order):

1. embedded (JPEG images in ID3v2 or MP4 tags only)
2. `./filename.{jpeg,jpg,bmp}`
3. `./albumtitle.{jpeg,jpg,bmp}`
4. `./cover.{jpeg,jpg,bmp}`
5. `./folder.jpg`
6. `/.rockbox/albumart/albumartist-albumtitle.{jpeg,jpg,bmp}`
7. `../albumtitle.{jpeg,jpg,bmp}`
8. `../cover.{jpeg,jpg,bmp}`

The following characters will be replaced with an underscore (_) when looking for albumtitle.bmp or albumartist-albumtitle.bmp: \ / : < > ? * |. Doublequotes will be replaced by single quotes. If no album artist is set, artist will be used instead. See ☞AlbumArt in the wiki for programs that will help you automate the process of putting album art on your player.

C. Theme Tags

Themeing is discussed in detail in section section 11.2 (page 132), what follows is a list of the available tags.

Note: The "bar-type tags" (such as %pb, %pv, %bl etc.) can be further themed – see section C.25 (page 158).

C.1. Status Bar

Tag	Description
`%we`	Display Status Bar
`%wd`	Hide Status Bar
`%wi`	Display the inbuilt Status Bar in the current viewport

These tags override the player setting for the display of the status bar. They must be noted on their own line (which will not be shown in the WPS).

C.2. Hardware Capabilities

Tag	Description
`%cc`	Check for presence of a real time clock, returns "c" when used unconditionally
`%tp`	Does this target have a radio?
`%Tp`	Indicates that the target has a touchscreen

With the above tags it is possible to find out about the presence of certain hardware and make the theme adapt to it. This can be very useful for designing a theme that works on multiple targets with differing hardware capabilities, e.g. targets that do and do not have a clock. When used conditionally, the "true" branch is completely ignored if it does not apply.

Example: `%?cc<%cH:%cM|No clock detected>`

C.3. Information from the track tags

Tag	Description
`%ia`	Artist
`%ic`	Composer
`%iA`	Album Artist
`%id`	Album Name
`%iG`	Grouping
`%ig`	Genre Name
`%in`	Track Number
`%it`	Track Title
`%iC`	Comment
`%iv`	ID3 version (1.0, 1.1, 2.2, 2.3, 2.4, or empty if not an ID3 tag)
`%iy`	Year
`%ik`	Disc Number

Remember that this information is not always available, so use the conditionals to show alternate information in preference to assuming.

These tags, when written with a capital "I" (e.g. `%Ia` or `%Ic`), show the information for the next song to be played.

C.4. Viewports

Tag	Description
`%V(x,y,[width],[height],[font])`	See section 11.2.2
`%Vl('identifier',...)`	Preloads a viewport for later display. 'identifier' is a single lowercase letter (a-z) and the '...' parameters use the same logic as the %V tag explained above.
`%Vd('identifier')`	Display the 'identifier' viewport. E.g. `%?C<%Vd(a)|%Vd(b)>` will show viewport 'a' if album art is found, and 'b' if it isn't.
`%Vi('label',...)`	Declare a Custom UI Viewport. The '...' parameters use the same logic as the `%V` tag explained above. See section 11.2.2.
`%VI('label')`	Set the Info Viewport to use the viewport called label, as declared with the previous tag.
`%VB`	Draw this viewport on the backdrop layer.

C.5. Additional Fonts

Tag	Description
`%Fl('id',filename)`	See section 11.2.4.

C.6. Misc Coloring Tags

Tag	Description
`%dr(x,y,width,heigh`	Color a rectangle.

width and height can be "−" to fill the viewport. If no color is specified the viewports foreground color will be used. If two colors are specified it will do a gradient fill.

C.7. Power Related Information

Tag	Description
`%bl`	Numeric battery level in percents. Can also be used in a conditional: `%?bl<-1|0|1|2|...|N>`, where the value −1 is used when the battery level isn't known (it usually is). The value N is only used when the battery level is exactly 100 percent. An image can also be used, the proportion of the image shown corresponds to the battery level: `%bl(x,y,[width],[height],image.bmp)`
`%bv`	The battery level in volts
`%bt`	Estimated battery time left
`%bp`	"p" if the charger is connected (only on targets that can charge batteries)
`%bc`	"c" if the unit is currently charging the battery (only on targets that have software charge control or monitoring)
`%bs`	Remaining time of the sleep timer (if it is set)

C.8. Information about the file

Tag	Description
%fb	File Bitrate (in kbps)
%fc	File Codec (e.g. "MP3" or "FLAC"). This tag can also be used in a conditional tag: %?fc<mp1|mp2|mp3|aiff|wav|ogg|flac|mpcsv7|a52|wavpack|alac|aac|shn|sid|adx|nsf|speex|spc|ape|wma|wmapro|mod|sap|realaudiocook|realaudioaac|realaudioac3|realaudioatrac3|cmc|cm3|cmr|cms|dmc|dlt|mpt|mpd|rmt|tmc|tm8|tm2|omaatrac3|smaf|au|vox|wave64|tta|wmavoice|mpcsv8|aache|ay|gbs|hes|sgc|vgm|kss|unknown>. The codec order is as shown above.
%ff	File Frequency (in Hz)
%fk	File Frequency (in kHz)
%fm	File Name
%fn	File Name (without extension)
%fp	File Path
%fs	File Size (in Kilobytes)
%fv	"(avg)" if variable bit rate or empty string if constant bit rate
%d(N)	N-th segment from the end of the file's directory (N can be 1, 2, 3, . . .)

Example for the %d(N) commands: If the file is "/Rock/Kent/Isola/11 - 747.mp3", %d(1) is "Isola", %d(2) is "Kent" and %d(3) is "Rock".

These tags, when written with the first letter capitalized (e.g. %Fn or %D(2)), produce the information for the next file to be played.

C.9. Playlist/Song Info

Tag	Description
%pb	Progress Bar. This will replace the entire line with a progress bar. You can set the position, width and height of the progressbar (in pixels) and load a custom image for it: %pb(x,y,[width],[height],image.bmp)
%px	Percentage played in song
%pc	Current time in song
%pe	Total number of playlist entries
%pm	Peak Meter. The entire line is used as volume peak meter.
%pL	Peak meter for the left channel. Can be used as a value, a conditional tag or a bar tag.
%pR	Peak meter for the right channel. Can be used as a value, a conditional tag or a bar tag.
%pn	Playlist name (without path or extension)
%pp	Playlist position
%pr	Remaining time in song
%ps	"s" if shuffle mode is enabled
%pt	Total track time
%pv	Current volume (in dB). Can also be used in a conditional: %?pv<Mute|...|0 dB|Above 0 dB> Mute is 0% volume, ... is the values between Mute and max, 0 dB is max volume, and Above 0 dB is amplified volume This can also be used like %pb to provide a continuous scale: %pv(x,y,[width],[height],image.bmp)
%pS	Track is starting. An optional number gives how many seconds the tag remains true for after the start of the track. The default is 10 seconds if no number is specified. %?pS(7)<in the first 7 seconds of track|in the rest of the track>
%pE	Track is ending. An optional number gives how many seconds before the end of the track the tag becomes true. The default is 10 seconds if no number is specified. %?pE(7)<in the last 7 seconds of track|in the rest of the track>
%Sp	Current playback pitch

C.10. Playlist Viewer

Tag	Description
%Vp(start,code to render)	Display the playlist viewer in the current viewport.

- 'start' is the offset relative to the currently playing track for the playlist to display from (0 the current track, 1 is the next track, etc.).
- 'code to render' is a line of skin code which will be displayed for each line in the viewer. All text tags are supported (including conditionals and sublines)

The entire viewport will be used, so don't expect other tags in the same viewport to work well. Supported tags are %pp, all tags starting with %i, most tags starting with %f, %pt and %s.

Example: `%Vp(1,%pp - %it,%pp - %fn)` – Display the playlist position, then either the track title (from the tags) or the filename. The viewer will display as many tracks as will fit in the viewport.

C.11. Runtime Database

Tag	Description
`%rp`	Song playcount
`%rr`	Song rating (0-10). This tag can also be used in a conditional tag: `%?rr<0|1|2|3|4|5|6|7|8|9|10>`
`%ra`	Autoscore for the song

C.12. Hold

Tag	Description
`%mh`	"h" if the main unit keys are locked

C.13. Virtual LED

Tag	Description
`%lh`	"h" if the flash storage is accessed

C.14. Repeat Mode

Tag	Description
`%mm`	Repeat mode, 0-4, in the order: Off, All, One, Shuffle, A-B

Example: `%?mm<Off|All|One|Shuffle|A-B>`

C.15. Playback Mode

Tag	Description
%mp	Play status, 0-4, in the order: Stop, Play, Pause, Fast Forward, Rewind, Recording, Recording paused, FM Radio playing, FM Radio muted

Example: `%?mp<Stop|Play|Pause|Ffwd|Rew|Rec|Rec pause|FM|FM pause>`

C.16. Current Screen

Tag	Description
%cs	The current screen, 1-20, in the order shown below

Number	Screen
1	Menus
2	WPS
3	Recording screen
4	FM Radio screen
5	Current Playlist screen
6	Settings menus
7	File browser
8	Database browser
9	Plugin browser
10	Quickscreen
11	Pitchscreen
12	Setting chooser
13	Playlist Catalogue Viewer
14	Plugin
15	Context menu
16	System Info screen
17	Time and Date Screen
18	Bookmark browser
19	Shortcuts menu
20	Track Info screen

The tag can also be used as the switch in a conditional tag. For players without certain capabilities (e.g. no FM radio) some values will never be returned.

Examples:

`You are in the %?cs<Main menu|WPS|Recording screen|FM Radio screen>`

```
%?if(%cs, =, 2)<This is the WPS>
```

C.17. List Title (.sbs only)

Tag	Description
%Lt	Title text. Should be used in a conditional so that non-list screens don't show a title when they shouldn't
%Li	Title icon. This uses the same order as custom icons (see ☞CustomIcons in the wiki) except that here 0 is "no icon"

This tag can be used to give custom formatting to list titles. Define a viewport with the font and formatting desired, and then use %?Lt<%Lt> to display the title within the viewport. If %Lt is present anywhere in the .sbs, then the %Vi viewport will not show the title.

C.18. Changing Volume

Tag	Description
%mv(t)	"v" if the volume is being changed

The tag produces the letter "v" while the volume is being changed and some amount of time after that, i.e. after the volume button has been released. The optional parameter t specifies that amount of time, in seconds. If it is not specified, 1 second is assumed.

The tag can be used as the switch in a conditional tag to display different things depending on whether the volume is being changed. It can produce neat effects when used with conditional viewports.

Example: %?mv(2.5)<Volume changing|%pv>

The example above will display the text "Volume changing" if the volume is being changed and 2.5 seconds after the volume button has been released. After that, it will display the volume value.

C.19. Settings

Tag	Description
%St(<setting name>)	The value of the Rockbox setting with the specified name. See section D (page 161) for the list of the available settings.
%St(...)	Draw a bar using from the setting. See section C.25 (page 158) for details.

Examples:

1. As a simple tag: `%St(skip length)`
2. As a conditional: `%?St(eq enabled)<Eq is enabled|Eq is disabled>`

C.20. Images

Tag	Description
`%x(n,filename[,x,y]`	Load and display an image `n`: image ID for later referencing in `%xd` `filename`: file name relative to `/.rockbox/` and including ".bmp" `x`: x coordinate (defaults to 0 if both x and y are not specified) `y`: y coordinate. (defaults to 0 if both x and y are not specified)
`%xl(n,filename,[x,y [nimages])`	Preload an image for later display (useful for when your images are displayed conditionally). `n`: image ID for later referencing in `%xd` `filename`: file name relative to `/.rockbox/` and including ".bmp" If the filename is "___list_icons___" the list icon bitmap will be used instead `x`: x coordinate (defaults to 0 if both x and y are not specified) `y`: y coordinate. (defaults to 0 if both x and y are not specified) `nimages`: (optional) number of sub-images (tiled vertically, of the same height) contained in the bitmap. Default is 1.
`%xd(n[i] [,tag] [,offset])`	Display a preloaded image. `n`: image ID as it was specified in `%x` or `%xl` `i`: (optional) number of the sub-image to display (a-z for 1-26 and A-Z for 27-52). (ignored when `tag` is used). Only useable if the ID is a single letter. By default the first (i.e. top most) sub-image will be used. `tag`: (optional) Another tag to calculate the subimage from e.g `%xd(A, %mh)` would use the first subimage when `%mh` is on and the second when it is off `offset`: (optional) Add this number to the value from the `tag` when chosing the subimage (may be negative)
`%x9(n)`	Display an image as a 9-patch bitmap covering the entire viewport. 9-patch images are bitmaps split into 9 segments where the four corners are unscaled, the four middle sections are scaled along one axis and the middle section is scaled on both axis. `n`: image ID

Examples:

1. Load and display the image `/.rockbox/bg.bmp` with ID "a" at 37, 109:
   `%x(a,bg.bmp,37,109)`
2. Load a bitmap strip containing 5 volume icon images (all the same size) with image ID "M", and then reference the individual sub-images in a conditional:
   `%xl(M,volume.bmp,134,153,5)`
   `%?pv<%xd(Ma)|%xd(Mb)|%xd(Mc)|%xd(Md)|%xd(Me)>`

Note:

- The images must be in BMP format
- The image tag must be on its own line
- The ID is case sensitive
- The size of the LCD screen for each player varies. See table below for appropriate sizes of each device. The x and y coordinates must respect each of the player's limits.

C.21. Alignment and language direction

Tag	Description
`%al`	Align the text left
`%aL`	Align the text left, or to the right if RTL language is in use
`%ac`	Centre the text
`%ar`	Align the text right
`%aR`	Align the text right, or to the left if RTL language is in use
`%ax`	The next tag should follow the set language direction. When prepended to a viewport declaration, the viewport will be horizontally mirrored if the user language is set to a RTL language. Currently the %Cl, %V and %Vl tags support this.
`%Sr`	Use as a conditional to define options for left to right, or right to left languages. %?Sr<RTL|LTR>

All alignment tags may be present in one line, but they need to be in the order left – centre – right. If the aligned texts overlap, they are merged.

Example: `%ax%V(...)`

C.22. Conditional Tags

Tag	Description
%?xx<true|false>	If / Else: Evaluate for true or false case
%?xx<alt1|alt2| alt3|...|else>	Enumerations: Evaluate for first / second / third / ... / last condition
%if(tag, operator, operand, [option count])	Allows very simple comparisons with other tags. tag: the tag to check against. operator: the comparison to perform – possible options are =, !=, >, >=, <, <= operand: either a second tag, a number, or text. [option count]: optional parameter used to select which parameter of a tag to use when the tag has multiple options, e.g. %?pv<a|b|c|d>
%and(tag1, tag2, ..., tagN)	Logical "and" operator. Will be evaluate to true if all the tag parameters are true.
%or(tag1, tag2, ..., tagN)	Logical "or" operator. Will be evaluate to true if any of the tag parameters are true.

Examples of the %if tag:

%?if(%pv, >=, 0)<Clipping possible|Volume OK> will display "Clipping possible" if the volume is higher than or equal to 0 dB, "Volume OK" if it is lower.

%?if(%ia, =, %Ia)<same artist> – this artist and the next artist are the same.

Note: When performing a comparison against a string tag such as %ia, only = and != work, and the comparison is not case sensitive.

C.23. Subline Tags

Tag	Description
%t(time)	Set the subline display cycle time (%t(5) or %t(3.4) formats)
;	Split items on a line into separate sublines

Allows grouping of several items (sublines) onto one line, with the display cycling round the defined sublines. See section 11.2.4 (page 135) for details.

C.24. Text Translation

Tag	Description
`%Sx(English)`	Display the translation of "English" in the current language

- "English" must be a phrase used in the language file.
- It should match the `Source:` line in the language file.

Note: checkwps cannot verify that the string is correct, so please check on either the simulator or on target.

C.25. Bar Tags

Some tags can be used to display a bar which draws according to the value of the tag. To use these tags like a bar you need to use the following parameters (%XX should be replaced with the actual tag).

Tag	Description
`%XX(x, y, width, height, [options])`	Draw the specified tag as a bar `x`: x co-ordinate at which to start drawing the bar. `y`: y co-ordinate at which to start drawing the bar (- to make the bar appear on the line of the tag, as if it was a text tag) . `width`: width of the bar (- for the full viewport width). `height`: height of the bar (- to set to the font height for horizontal bars and to the viewport height for vertical bars). `options`: any of the options set out below.

C.25.1. Options

image – the next option is either the filename or image label to use for the fill image.

horizontal – force the bar to be drawn horizontally.

vertical – force the bar to be drawn vertically.

invert – invert the draw direction (i.e. right to left, or top to bottom).

slider – draw a preloaded image over the top of the bar so that the centre of the image matches the current position. This must be followed by the label of the desired image.

backdrop – draw a preloaded image under the bar. The full image will be displayed and must be the same size as the bar. This must be followed by the label of the desired image.

nofill – don't draw the bar, only its frame (for use with the "slider" option).

noborder – don't draw the border for image-less bars, instead maximise the filling over the specified area. This doesn't work for bars which specify an image.

nobar – don't draw the bar or its frame (for use with the "slider" option).

setting – Specify the setting name to draw the bar from (bar must be %St type), the next param is the settings config name.

Example: `%pb(0,0,-,-,-,nofill, slider, slider_image, invert)` – draw a horizontal progressbar which doesn't fill and draws the image "slider_image" which moves right to left.

Note: If the slider option is used, the bar will be shrunk so that the slider fits inside the specified width and height. Example: A 100px bar image with a 16px slider image needs the bar to be 116px wide, and should be offset 8px left of the backdrop image to align correctly.

C.26. Other Tags

Tag	Description
`%ss(start, length, tag [,number]`	Get a substring from another tag.

Use this tag to get a substring from another tag.

start – first character to take (0 being the start of the string, negative means from the end of the string)

length – length of the substring to return (- for the rest of the string)

tag – tag to get

number – OPTIONAL. if this is present it will assume the substring is a number so it can be used with conditionals. (i.e `%cM`). 0 is the first conditional option

Tag	Description
`%(`	The character '('
`%)`	The character ')'
`%,`	The character ','
`%%`	The character '%'
`%<`	The character '<'
`%|`	The character '|'
`%>`	The character '>'
`%;`	The character ';'
`%#`	The character '#'
`%s`	Indicate that the line should scroll. Can occur anywhere in a line (given that the text is displayed; see conditionals above). You can specify up to ten scrolling lines. Scrolling lines can not contain dynamic content such as timers, peak meters or progress bars.

D. Config file options

Setting	Allowed Values	Unit
volume	−100 to +12	dB
bass	−12 to +12	dB
treble	−12 to +12	dB
balance	−100 to +100	%
channels	stereo, mono, custom, mono left, mono right, karaoke	N/A
stereo_width	0 to 250	%
shuffle	on, off	N/A
repeat	off, all, one, shuffle, ab	N/A
play selected	on, off	N/A
party mode	on, off	N/A
scan min step	1, 2, 3, 4, 5, 6, 8, 10, 15, 20, 25, 30, 45, 60	s
seek acceleration	very fast, fast, normal, slow, very slow	N/A
antiskip	5s, 15s, 30s, 1min, 2min, 3min, 5min, 10min	N/A
volume fade	on, off	N/A
sort case	on, off	N/A
show files	all, supported, music, playlists	N/A
show filename exts	off, on, unknown, view_all	N/A
follow playlist	on, off	N/A
playlist viewer icons	on, off	N/A
playlist viewer indices	on, off	N/A
playlist viewer track display	track name,full path	N/A
recursive directory insert	on, off, ask	N/A
scroll speed	1 to 25	Hz
scroll delay	0 to 2500	ms
scroll step	**devise a way to get ranges from config-*.h**	pixels
screen scroll step	**devise a way to get ranges from config-*.h**	pixels
Screen Scrolls Out Of View	on, off	N/A

Setting	Allowed Values	Unit
bidir limit	0 to 200	% screen
scroll paginated	on, off	N/A
hold_lr_for_scroll_in_list	on, off	N/A
show path in browser	off, current directory, full path	N/A
contrast	0 to 63	N/A
backlight timeout	off, on, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 45, 60, 90, 120	s
backlight timeout plugged	off, on, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 45, 60, 90, 120	s
backlight filters first keypress	on, off	N/A
backlight on button hold	normal, off, on	N/A
caption backlight	on, off	N/A
brightness	**devise a way to get ranges from config-*.h**	N/A
disk spindown	3 to 254	s
battery capacity	**devise a way to get ranges from config-*.h**	mAh
battery type	alkaline, nimh	N/A
idle poweroff	off, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 30, 45, 60	min
sleeptimer duration	5 to 300 (in steps of 5)	min
sleeptimer on startup	off, on	N/A
keypress restarts sleeptimer	off, on	N/A
max files in playlist	1000 to 32000	N/A
max files in dir	50 to 10000	N/A
lang	/path/filename.lng	N/A
wps	/path/filename.wps	N/A
autocreate bookmarks	off, on	N/A
autoload bookmarks	off, on	N/A
use most-recent-bookmarks	off, on, unique only, one per track	N/A
pause on headphone unplug	off, pause, pause and resume	N/A
rewind duration on pause	0 to 15	s
disable autoresume if phones not present	off, on	N/A
Last.fm Logging	off, on	N/A
talk dir	off, number, spell	N/A
talk dir clip	off, on	N/A
talk file	off, number, spell	N/A

Setting	Allowed Values	Unit
talk file clip	off, on	N/A
talk filetype	off, on	N/A
talk menu	off, on	N/A
Announce Battery Level	off, on	N/A
sort files	alpha, oldest, newest, type	N/A
sort dirs	alpha, oldest, newest	N/A
sort interpret number	digits, numbers	N/A
tagcache_autoupdate	on, off	N/A
warn when erasing dynamic playlist	on, off	N/A
cuesheet support	on, off	N/A
folder navigation	off, on, random	N/A
constrain next folder	off, on	N/A
gather runtime data	off, on	N/A
skip length	outro, track, 1s, 2s, 3s, 5s, 7s, 10s, 15s, 20s, 1min, 90s, 2min, 3min, 5min, 10min, 15min	N/A
prevent track skip	on, off	N/A
start in screen	previous, root, files, dB, wps, menu, bookmarks	N/A
playlist catalog directory	/path/to/dir	N/A
list_accel_start_delay	0 to 10	ms
list_accel_wait	1 to 10	s
loudness	0 to 17	N/A
superbass	on, off	N/A
auto volume	off, 20ms, 2s, 4s, 8s	N/A
mdb enable	on,off	N/A
mdb strength	0 to 127	dB
mdb harmonics	0 to 100	%
mdb center	20 to 300	Hz
mdb shape	50 to 300	Hz
peak meter release	1 to 126	?
peak meter hold	off, 200ms, 300ms, 500ms, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 1min	N/A
peak meter clip hold	on, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 45, 60, 90, 2min, 3min, 5min, 10min, 20min, 45min, 90min	N/A
peak meter busy	on, off	N/A
peak meter dbfs	on, off	on: dbfs, off: linear
peak meter min	0 to 89 (dB) or 0 to 100 (%)	dB or %
peak meter max	0 to 89 (dB) or 0 to 100 (%)	dB or %

Setting	Allowed Values	Unit
statusbar	off, top, bottom	N/A
scrollbar	off, left, right	N/A
scrollbar width	3 to LCD width / 10 (**devise a way to get ranges from config-*.h**)	pixels
volume display	graphic, numeric	N/A
battery display	graphic, numeric	N/A
font	/path/filename.fnt	N/A
kbd	/path/filename.kbd	N/A
invert	on, off	N/A
flip display	on, off	N/A
selector type	pointer, bar (inverse)	N/A
show icons	on, off	N/A
iconset	/path/filename.bmp	N/A
viewers iconset	/path/filename.bmp	N/A

E. Menu Overview

include an overview of the menu structure here

F. User feedback

F.1. Bug reports

If you experience inappropriate performance from any supported feature, please file a bug report on our web page. Do not report missing features as bugs, instead file them as feature ideas (see below).

For open bug reports refer to http://www.rockbox.org/tracker/index.php?type=2

F.1.1. Rules for submitting new bug reports

1. Check that the bug has not already been reported
2. Always include the following information in your bug report:
   - Which exact player you have.
   - Which exact Rockbox version you are using (Menu → System → Rockbox Info → Version)
   - A step-by-step description of what you did and what happened
   - Whether the problem is repeatable or a one-time occurrence
   - All relevant data regarding the problem, such as playlists, MP3 files etc. (IMPORTANT!)

F.2. Feature ideas

To suggest an idea for a feature or to read those made by others, see http://forums.rockbox.org/index.php?board=49.0. Please keep in mind that this forum is for the discussion of feature ideas – they are not requests and there is no guarantee they will be acted upon.

F.2.1. Rules for submitting a new feature idea

1. Check that the feature has not already been suggested. Duplicates are really boring!
2. Check that the feature has not already been implemented. Download the latest current/daily build and/or search the mail list archive.
3. Check that the feature is possible to implement (see section F.2.2 (page 167)).

F.2.2. Features we will not implement

This is a list of Feature Requests we get repeatedly that we simply cannot do. View it as the opposite of a TODO!

- Record to WAV (uncompressed) or MP3pro format.
  The recording hardware (the MAS) does not allow us to do this
- Crossfade between tracks.
  Crossfading would require two mp3 decoders, and we only have one. This is not possible.
- Support MP3pro, WMA or other sound format playback.
  The mp3-decoding hardware can only play MP3. We cannot make it play other sound formats.
- Converting OGG → MP3.
  The mp3-decoding hardware cannot decode OGG. It can be reprogrammed, but there is too little memory for OGG and we have no documentation on how to program the MAS' DSP. Doing the conversion with the CPU is impossible, since a 12 MHz SH1 is far too slow for this daunting task.
- Archos Multimedia support.
  The Archos Multimedia is a completely different beast. It is an entirely different architecture, different CPU and upgrading the software is done a completely different way. We do not wish to venture into this. Others may do so. We will not.
- Multi-band (or graphic) equaliser.
  We cannot access information for that kind of visualisation from the MP3 decoding hardware.
- CBR recording.
  The MP3 encoding hardware does not allow this.
- Change tempo of a song without changing pitch.
  The MP3 decoding hardware does not allow this.
- Graphic frequency (spectrum analyser).
  We cannot access the audio waveform from the MP3 decoder so we cannot analyse it. Even if we had access to it, the CPU would probably be too slow to perform the analysis anyway.
- Cool sound effects.
  Adding new sound effects requires reprogramming the MAS chip, and we cannot do that. The MAS chip is programmable, but we have no access to the chip documentation.

- Interfacing with other USB devices (like cameras) or 2 player games over USB.
  The USB system demands that there is a master that talks to a slave. The player can only serve as a slave, as most other USB devices such as cameras can. Thus, without a master no communication between the slaves can take place. If that is not enough, we have no way of actually controlling the communication performed over USB since the USB circuit in the player is strictly made for disk-access and does not allow us to play with it the way we'd need for any good communication to work.

- Support other file systems than FAT32 (like NTFS or ext2 etc.).
  No. Rockbox needs to support FAT32 since it can only start off a FAT32 partition (since that is the only way the ROM can load it), and addingsupport for more file systems will just take away valuable ram for unnecessary features. You can partition your player fine, just make sure the first one is FAT32 and then make the other ones whatever file system you want. Just do not expect Rockbox to understand them.

- Add scandisk-like features.
  It would be a very slow operation that would drain the batteries and take a lot of useful ram for something that is much better and faster done when connected to a host computer.

- Alphabetical list skipping.
  Skipping around the lists by jumping letters (i.e skip all C's and go straight to the first D). This isn't feasible with the current list implementation, if you really want this you can get similar effects using the database (see section 4.2 (page 24)).

- Add support for non standard tag formats.
  APE tags in MP3 files has been rejected a few times already. Its not something we want.

- Implementing the ability to playback DRM files.
  Firstly, this would be extremely difficult to implement legally – Rockbox is not legal entity as such, and therefore is unable to enter into license agreements with providers of DRM technology. Secondly, Rockbox is open source, which would mean that any DRM technology we incorporated into our codebase would suddenly become visible to the whole world, completely defeating its purpose. Remember, DRM achieves part of its security through obscurity, and publishing the keys necessary to decrypt DRM'd media would essentially render it useless.

G. Credits

People that have contributed to the project, one way or another. Friends!

▶ Björn Stenberg ▶ Linus Nielsen Feltzing ▶ Andy Choi ▶ Andrew Jamieson ▶ Paul Suade ▶ Joachim Schiffer ▶ Daniel Stenberg ▶ Alan Korr ▶ Gary Czvitkovicz ▶ Stuart Martin ▶ Felix Arends ▶ Ulf Ralberg ▶ David Härdeman ▶ Thomas Saeys ▶ Grant Wier ▶ Julien Labruyére ▶ Nicolas Sauzede ▶ Robert Hak ▶ Dave Chapman ▶ Stefan Meyer ▶ Eric Linenberg ▶ Tom Cvitan ▶ Magnus Öman ▶ Jerome Kuptz ▶ Julien Boissinot ▶ Nuutti Kotivuori ▶ Heikki Hannikainen ▶ Hardeep Sidhu ▶ Markus Braun ▶ Justin Heiner ▶ Magnus Holmgren ▶ Bill Napier ▶ George Styles ▶ Mats Lidell ▶ Lee Marlow ▶ Nate Nystrom ▶ Nick Robinson ▶ Chad Lockwood ▶ John Pybus ▶ Uwe Freese ▶ Randy Wood ▶ Gregory Haerr ▶ Philipp Pertermann ▶ Gilles Roux ▶ Mark Hillebrand ▶ Damien Teney ▶ Andreas Zwirtes ▶ Kjell Ericson ▶ Jim Hagani ▶ Ludovic Lange ▶ Mike Holden ▶ Simon Elén ▶ Matthew P. O'Reilly ▶ Christian Schönberger ▶ Henrik Backe ▶ Craig Sather ▶ José Maria Garcia-Valdecasas Bernal ▶ Stevie Oh ▶ Jörg Hohensohn ▶ Dave Jones ▶ Thomas Paul Diffenbach ▶ Roland Kletzing ▶ Itai Shaked ▶ Keith Hubbard ▶ Benjamin Metzler ▶ Frederic Dang Ngoc ▶ Pierre Delore ▶ Huw Smith ▶ Garrett Derner ▶ Barry McIntosh ▶ Leslie Donaldson ▶ Lee Pilgrim ▶ Zakk Roberts ▶ Francois Boucher ▶ Matthias Wientapper ▶ Brent Coutts ▶ Jens Arnold ▶ Gerald Vanbaren ▶ Christi Scarborough ▶ Steve Cundari ▶ Mat Holton ▶ Jan Gajdos ▶ Antoine Cellerier ▶ Brian King ▶ Jiri Jurecek ▶ Jacob Erlbeck ▶ Jean-Philippe Bernardy ▶ Dave Hooper ▶ Jonas Häggqvist ▶ Thom Johansen ▶ Rinat Zakirov ▶ Manuel Dejonghe ▶ Marcoen Hirschberg ▶ Michiel van der Kolk ▶ Tony Motakis ▶ Andy Young ▶ Alexandre Bourget ▶ Richard S. La Charité III ▶ Christian Gmeiner ▶ Tomas Salfischberger ▶ Miika Pekkarinen ▶ Tapio Karppinen ▶ Richard Ottó O'Brien ▶ Luca Burelli ▶ Alessio Lenzi ▶ David Bryant ▶ Martin Arver ▶ Alexander Spyridakis ▶ Pedro Baltazar Vasconcelos ▶ Ray Lambert ▶ Dave Wiard ▶ Pieter Bos ▶ Konstantin Isakov ▶ Bryan Vandyke ▶ Hristo Kovachev ▶ Sander Sweers ▶ Antonius Hellman ▶ Ryan Jackson ▶ Per Holmäng ▶ Frederic Devernay ▶ José M. Fandiño ▶ Gadi Cohen ▶ Naftali Goldstein ▶ David Dent ▶ Frank Dischner ▶ Liberman Shachar ▶ Stephan Wezel ▶ Alyssa Milburn ▶ Kevin Ferrare ▶ Anton Oleynikov ▶ Mark Arigo ▶ Magnus Westerlund ▶ Jake Owen ▶ Mustapha Senhaji ▶ Adam Boot ▶ Jonathan Gordon ▶ Tat Tang ▶ Toshihiko Itoh ▶ David J. Song ▶ Jeong Taek In ▶ Anders Kagerin ▶ Peter D'Hoye ▶ Ben Basha ▶ Brandon Low ▶ Nathan

Hand ▶ Nick Lanham ▶ Sebastian Henriksen ▶ Martin Scarratt ▶ Karl Kurbjun ▶ Tomasz Malesinski ▶ Andrew Pilley ▶ Matt v.d. Westhuizen ▶ Tim Crist ▶ Jvo Studer ▶ Dan Everton ▶ Imre Herceg ▶ Seven Le Mesle ▶ Craig Bachelor ▶ Nikolaj Christensen ▶ Mikael Magnusson ▶ Dominik Wenger ▶ Henrico Witvliet ▶ Andrew Scott ▶ Miguel A. Arévalo ▶ Aaron F. Gonzalez ▶ Aleksey Kozyulin ▶ Jani Kinnunen ▶ Rui Marinho ▶ Alun Thomas ▶ Nils Wallménius ▶ Naoaki Okazaki ▶ Will Dyson ▶ Matthias Mohr ▶ Christian Marg ▶ Eli Sherer ▶ Fredrik Öhrn ▶ Nicolas Pennequin ▶ Ralf Herz ▶ Michael DiFebbo ▶ David Rothenberger ▶ Robert Keevil ▶ Mark Bright ▶ Dominik Riebeling ▶ Alexander Bondar ▶ Peter Cawley ▶ Rani Hod ▶ Tom Ross ▶ Anton Romanov ▶ Jean-Luc Ohl ▶ Steve Bavin ▶ Marianne Arnold ▶ Gaetano Vocca ▶ Frederik Vestre ▶ Wenbin Leo ▶ Tom Evans ▶ Ewan Davies ▶ Frédéric François ▶ Marc-André Moreau ▶ Ioannis Koutoulakis ▶ Alistair Marshall ▶ Karl Ove Hufthammer ▶ Víctor Zabalza ▶ Ulrich Pegelow ▶ Andreas Mattsson ▶ Daniel Ankers ▶ Paul Louden ▶ Rainer Sinsch ▶ Plácido Revilla ▶ Michael Sevakis ▶ Lukas Sabota ▶ Emanuel Zephir ▶ Alexander Levin ▶ Barry Wardell ▶ Lars van de Klomp ▶ Philippe Miossec ▶ Jochen Kemnade ▶ Corry Lazarowitz ▶ Tom Meyer ▶ Laurent Baum ▶ James Teh ▶ Liam Nattrass ▶ Christian Hack ▶ Wade Brown ▶ Vadim Chekan ▶ Christopher Borcsok ▶ Victor Cardenas ▶ Andrew Melville ▶ Pengxuan Liu ▶ Andrew Cupper ▶ Thilo-Alexander Ginkel ▶ Adam Gashlin ▶ Robert Kukla ▶ David Quesada ▶ Jared Stafford ▶ Martin Hensel ▶ Stéphane Doyon ▶ Austin Appel ▶ Andre Smith ▶ Travis Hyyppa ▶ Ian Webber ▶ Pavel Gnelitsa ▶ Lutz Böhne ▶ Will Robertson ▶ Robert Carboneau ▶ Ye Wei ▶ Bryan Childs ▶ Mike Schmitt ▶ Chris Taylor ▶ Tobias Langhoff ▶ Steve Gotthardt ▶ Greg White ▶ Mattieu Favréaux ▶ Malcolm Tyrrell ▶ Piotr Jafiszow ▶ Gary Allen ▶ John BouAntoun ▶ Tomasz Mon ▶ Jakub Matoušek ▶ Albert Veli ▶ Chris Dohan ▶ Takashi Obara ▶ Rene Peinthor ▶ Roan Horning ▶ Ben Keroack ▶ Sean Morrisey ▶ Shay Green ▶ Nick Vanderweit ▶ Simon Menzel ▶ Timo Horstschäfer ▶ Jacco Koning ▶ Chris Ham ▶ Jose Ramon Garcia ▶ Simon Descarpentries ▶ Douglas Valentine ▶ Jacob Gardner ▶ Pascal Briehl ▶ Denis Stanishevskiy ▶ Eddy Coman ▶ Luke Blaney ▶ Mark Reiche ▶ Michal Jevjak ▶ Philippe Latulippe ▶ Mauricio Peccorini ▶ Nathan Hepting ▶ Akio Idehara ▶ Dagni McPhee ▶ Alex Gerchanovsky ▶ Gerhard Dirschl ▶ Ivan Zupan ▶ Alexander Papst ▶ Christoph Reiter ▶ Rhino Banga ▶ Paul Jones ▶ Michael Giacomelli ▶ Alex Wenger ▶ Andree Buschmann ▶ Johnathon Mihalop ▶ Rene Allkivi ▶ Tobias Schladt ▶ John Zhou ▶ Charles Voelger ▶ Gerritt Gonzales ▶ Dieter Pellkofer ▶ Evgeniy Kachalin ▶ Lenny Koepsell ▶ Harry Tu ▶ Pawel Wysocki ▶ Xinlu Huang ▶ Daniel Dalton ▶ Boris Gjenero ▶ Sylvain Fourmanoit ▶ Alex Parker ▶ Mario Lang ▶ Justin Foell ▶ Igor Kuzmin ▶ Adilson Vicente Xavier ▶ Jesse Lockwood ▶ Jonathan Backer ▶ Sofian Babai ▶ Costas Calamvokis ▶ Catalin Patulea ▶ Peter Harley ▶ Max Kelley ▶ Alexander Eickhoff ▶ Ken Fazzone ▶ David Bishop ▶ Hein-Pieter van Braam ▶ Przemysław Hołubowski

▶ Stepan Moskovchenko ▶ John S. Gwynne ▶ Brian J. Morey ▶ Stijn Hisken ▶ Bertrik Sikken ▶ Karim Boucher ▶ James Espinoza ▶ Franz Rühmland ▶ Jordan Anderson ▶ Maurus Cuelenaere ▶ Chris Allegretta ▶ Alastair S ▶ Martin Crkovský ▶ Ariya Hidayat ▶ Jonas Hurrelmann ▶ Lee Kang Hyuk ▶ Clemens Werther ▶ Robert Menes ▶ Henri Valta ▶ Melba Sitjar ▶ Mehmet Ş. Çatalbaş ▶ Scott Tinman ▶ Alexander Kuzmenkov ▶ Thomas Martitz ▶ Prakarn Sahasoontornvute ▶ George Tamplaru ▶ Apoorva Mahajan ▶ Vuong Minh Hiep ▶ Mateusz Kubica ▶ Frank Gevaerts ▶ Chelo Sacristán ▶ Sascha Wolf ▶ Nickolay Jordanov ▶ Johannes Voggenthaler ▶ Marc Guay ▶ Alex Vanderpol ▶ Jerry Lange ▶ Yohann Misquitta ▶ Keith Perri ▶ Mark Fawcus ▶ Ivan Pesic ▶ Marcel Barbulescu ▶ Phil Light ▶ Rob Purchase ▶ Andreas Müller ▶ Christopher Williams ▶ Martin Ritter ▶ Justin Hannigan ▶ Tomasz Wasilczyk ▶ Kenjiro Arai ▶ John Kaminar ▶ Joris Goosen ▶ Mark Ganson ▶ Davide Gentile ▶ James Vasile ▶ Mohamed Tarek ▶ Mike Burke ▶ Michael Chicoine ▶ Maciej Adamczak ▶ Tomer Shalev ▶ Thibaut Girka ▶ Rasmus Ry ▶ William Poetra Yoga Hadisoeseno ▶ Adrian Osoianu ▶ Martin Pahl ▶ Ori Avtalion ▶ Thomas Schott ▶ Dennis Ivanov ▶ Takumi Suzuki ▶ Shunsuke Shimizu ▶ Tadayuki Nishizono ▶ Jun Gu ▶ Daniel Weck ▶ Clément Pit-Claudel ▶ Jelle Geerts ▶ Tadeusz Pyś ▶ Rostislav Chekan ▶ Florin Popescu ▶ Volker Mische ▶ Vitja Makarov ▶ Francisco Vila ▶ Christian Lees ▶ Rafaël Carré ▶ Denes Balatoni ▶ Roy Wallace ▶ Eric Lassauge ▶ François Dinel ▶ Francesco Rigoni ▶ Joël Puik ▶ Klaas Bosteels ▶ Teruaki Kawashima ▶ Marcin Łukasik ▶ Le Jin ▶ Alex Bennee ▶ Stéphane Quertinmont ▶ Bartosz Fabianowski ▶ Adam Hogan ▶ Andrew Mahone ▶ Anton Veretenenko ▶ Vicente Ibarra ▶ Rui Araújo ▶ Brian Cloutier ▶ Olivier Barbut ▶ Yoshihisa Uchida ▶ Sanggon Lee ▶ Kaspar Rothenfusser ▶ Ryan Press ▶ Craig Elliott ▶ Kenderes Tamas ▶ Eric Shattow ▶ Joshua Simmons ▶ Sei Aoyumi ▶ Martin Pool ▶ Gareth Schakel ▶ Brian Sutherland ▶ Sam Bouwer ▶ Johannes Linke ▶ Michaël Burtin ▶ Sasha Khamkov ▶ Kai Posadowsky ▶ Jack Halpin ▶ Johannes Schwarz ▶ Dustin Skoracki ▶ Torne Wuff ▶ Wookey ▶ Nick Sant ▶ Michael Carr ▶ Eric Clayton ▶ Marko Pahlke ▶ Vytenis Sabelka ▶ Nicolas Pitre ▶ Benedikt Goos ▶ Frederick Full ▶ Jeffrey Goode ▶ Raafat Akkad ▶ Davide Quarta ▶ Andre Lupa ▶ Hilton Shumway ▶ Matthew Bonnett ▶ Nick Tryon ▶ David Johnston ▶ Ralph Soto ▶ Mykhailo Radzievskyi ▶ Christophe Gouiran ▶ Asael Reiter ▶ Jens Erdmann ▶ Rosso Maltese ▶ Amaury Pouly ▶ Laurent Papier ▶ Johannes Boy ▶ Jason Yu ▶ Aaron DeMille ▶ Tomasz Kowalczyk ▶ Michael Lechner ▶ Peter Schlenker ▶ Dan Davison ▶ David Kauffmann ▶ Carsten Schreiter ▶ Michael Sparmann ▶ Seth Opgenorth ▶ Jonas Aaberg ▶ Junio C Hamano ▶ Bob Cousins ▶ Christophe Nicolas ▶ Yann Muller ▶ Sascha Wilde ▶ Fred Bauer ▶ Simon Rothen ▶ Pavel Rzehák ▶ Diego Herranz ▶ Viktor Varga ▶ Juliusz Chroboczek ▶ Christian Beier ▶ Giovanni Zilli ▶ Shiloh Hawley ▶ Peter Lecký ▶ Wilfred Hughes ▶ Laurent Gautier ▶ Simon Zhukovsky ▶ Daniel Kluz ▶ Phinitnun Chanasabaeng ▶ Tse-Hsien Chiang ▶ Szymon Dziok ▶ Domenico Di Misa

▶ Delyan Kratunov ▶ Purling Nayuki ▶ Marek Salaba ▶ Altay Oz ▶ Mark Borgerding ▶ Tobias Diedrich ▶ Andrew Engelbrecht ▶ Kevin Schoedel ▶ Jens Theess ▶ Alexey Nemtsev ▶ Pascal Below ▶ Danny Attar ▶ Philipp Stephani ▶ Tore Johnny Bråtveit ▶ Marcin Bukat ▶ Andrew Rodland ▶ Luca Leonardo Scorcia ▶ Gerhard Zintel ▶ Adrián Cereto Massagué ▶ Chris Savery ▶ Raphaël Jakse ▶ Wincent Balin ▶ Aaron Rothbaum ▶ Nejc Lotric ▶ Hinrik Örn Sigurðsson ▶ Stephen Carroll ▶ Joe Balough ▶ Jérôme Heil ▶ Tim Graf ▶ Martin Sägmüller ▶ Joshua Hulst ▶ Pierre-Yves Roosens ▶ Hayden Pearce ▶ Rodrigo Barretto ▶ Daniel Rigby ▶ Alexey Polkhirev ▶ István Nagy ▶ Wojciech Leśniak ▶ Tuomas Airaksinen ▶ Calvin Walden ▶ Michael Gentry ▶ David Fowle ▶ Fabian Vogel ▶ Michael Stummvoll ▶ Franz-Josef Haider ▶ Michael Hohmuth ▶ Sergio Vera ▶ Michael Leslie ▶ Craig Mann ▶ William Peters ▶ Li Jie ▶ Cristina Talpiga ▶ Alexander Meshcheryakov ▶ Ryan Sawhill ▶ Thomas Jarosch ▶ Will Sowerbutts ▶ Gabriel Maia ▶ Robert Horn ▶ Ante Maretic ▶ Benjamin Brown ▶ Uwe Wiebach ▶ Mikhail Titov ▶ Dave Slusher ▶ Jean-Marie Moraux ▶ Ismael Castiñeira Álvarez ▶ Mārtiņš Šimis ▶ Huan Zhang ▶ Leif Andersen ▶ Sergiu Rotaru ▶ Noé Lojkine ▶ Ophir Lojkine ▶ Stephan Grossklass ▶ John Morris ▶ Sean Bartell ▶ Seheon Ryu ▶ Asier Arsuaga ▶ Vencislav Atanasov ▶ Mauricio Garrido ▶ Nick Peskett ▶ Michael Goerner ▶ Richard Brittain ▶ Andrew Ryabinin ▶ Maksim Postolati ▶ Stanislav Chizhik ▶ Desu Rozen ▶ Olivier Kaloudoff ▶ Kessia Pinheiro ▶ Jean-Louis Biasini ▶ Lorenzo Miori ▶ James Hunt ▶ Artur Juraszek ▶ Wieland Hoffmann ▶ Nathan Korth ▶ Igor Petelin ▶ Cástor Muñoz ▶ Albert Barca ▶ Fukuda Takafumi ▶ Dimitar Dimitrov ▶ Osborne Jacobs ▶ Marty Miller ▶ Eduardo Gonzalez ▶ Enric Morales ▶ Mateusz Renkiewicz ▶ Dario Castellarin ▶ Thiago Kenji Okada ▶ Manuel Flury ▶ Vanja Cvelbar ▶ Richard Quirk ▶ Kirill Stryaponoff ▶ Roman Poltoradnev ▶ Ryan Billing ▶ Dmitry Gamza ▶ Sebastian Leonhardt ▶ Avi Eisenberg ▶ Richard Burke ▶ Franklin Wei ▶ Serhij Kyryljan ▶ Yifu Huang ▶ Jonathan Bettencourt ▶ Ilia Sergachev ▶ Nial Shui ▶ Mihail Zenkov ▶ Thomas Orgis ▶ Kostadin Kolev ▶ Jordi Prenafeta ▶ Tiago Medeiros ▶ Udo Schläpfer ▶ Thomas White ▶ Karl Huber ▶ Adam Sampson ▶ William Wilgus ▶ Igor Skochinsky ▶ Sebastiano Pistore ▶ Stefan Schneider-Kennedy ▶ Johannes Rauh ▶ Constantine Mountantonakis ▶ Ivan Pesic ▶ Jonatan Nyberg ▶ Alessandro Stoppani ▶ Alexander Yurenin ▶ Roman Stolyarov ▶ Solomon Peachy ▶ Igor Poretsky ▶ Adam Rak ▶ Rémi Oudin ▶ Malik Enes Şafak ▶ Roman Levkin-Taymenev ▶ Nathan Follens ▶ Gergely Békési ▶ Stephane Doyon ▶ Alex Wallis ▶ The libmad team ▶ The wavpack team ▶ The FFmpeg team ▶ The Ogg Vorbis team ▶ The liba52 team ▶ The Speex team ▶ The libfaad team ▶ The Doom team ▶ The gnuchess team ▶ The gnuboy team ▶ The Pacman Instructional Emulator team ▶ The Spectemu team ▶ The libmpeg2 team ▶ The Game_Music_Emu team ▶ The OpenSPC DSP emulator team ▶ The ALAC decoder team ▶ The UCL team ▶ The iPod Linux team ▶ The Vision-8 Emulator team ▶ The robotfindskitten team ▶ The libmtp team ▶ The asap team ▶ The libpng

team ▶ The Pure Data team (Miller Puckette and others) ▶ The MikMod team ▶ Michael McTernan (The ARM unwinder author) ▶ Albert Song ▶ The New RAW team (Piotr Padkowski and others) ▶ The Fabother World team (Fabien Sanglard and others) ▶ The sgt-puzzles team (Simon Tatham and others) ▶ The Chocolate Duke Nukem 3D team

H. Licenses

H.1. GNU Free Documentation License

Version 1.2, November 2002
Copyright ©2000,2001,2002 Free Software Foundation, Inc.

51 Franklin St, Fifth Floor, Boston, MA 02110-1301 USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The purpose of this License is to make a manual, textbook, or other functional and useful document "free" in the sense of freedom: to assure everyone the effective freedom to copy and redistribute it, with or without modifying it, either commercially or non-commercially. Secondarily, this License preserves for the author and publisher a way to get credit for their work, while not being considered responsible for modifications made by others.

This License is a kind of "copyleft", which means that derivative works of the document must themselves be free in the same sense. It complements the GNU General Public License, which is a copyleft license designed for free software.

We have designed this License in order to use it for manuals for free software, because free software needs free documentation: a free program should come with manuals providing the same freedoms that the software does. But this License is not limited to software manuals; it can be used for any textual work, regardless of subject matter or whether it is published as a printed book. We recommend this License principally for works whose purpose is instruction or reference.

1. APPLICABILITY AND DEFINITIONS

This License applies to any manual or other work, in any medium, that contains a notice placed by the copyright holder saying it can be distributed under the terms of this License. Such a notice grants a world-wide, royalty-free license, unlimited in duration, to use that work under the conditions stated herein. The **"Document"**, below, refers to any such manual or work. Any member of the public is a licensee, and is addressed as **"you"**. You accept the license if you copy, modify or distribute the work in a way requiring permission under copyright law.

A **"Modified Version"** of the Document means any work containing the Document or a portion of it, either copied verbatim, or with modifications and/or translated into another language.

A **"Secondary Section"** is a named appendix or a front-matter section of the Document that deals exclusively with the relationship of the publishers or authors of the Document to the Document's overall subject (or to related matters) and contains nothing that could fall directly within that overall subject. (Thus, if the Document is in part a textbook of mathematics, a Secondary Section may not explain any mathematics.) The relationship could be a matter of historical connection with the subject or with related matters, or of legal, commercial, philosophical, ethical or political position regarding them.

The **"Invariant Sections"** are certain Secondary Sections whose titles are designated, as being those of Invariant Sections, in the notice that says that the Document is released under this License. If a section does not fit the above definition of Secondary then it is not allowed to be designated as Invariant. The Document may contain zero Invariant Sections. If the Document does not identify any Invariant Sections then there are none.

The **"Cover Texts"** are certain short passages of text that are listed, as Front-Cover Texts or Back-Cover Texts, in the notice that says that the Document is released under this License. A Front-Cover Text may be at most 5 words, and a Back-Cover Text may be at most 25 words.

A **"Transparent"** copy of the Document means a machine-readable copy, represented in a format whose specification is available to the general public, that is suitable for revising the document straightforwardly with generic text editors or (for images composed of pixels) generic paint programs or (for drawings) some widely available drawing editor, and that is suitable for input to text formatters or for automatic translation to a variety of formats suitable for input to text formatters. A copy made in an otherwise Transparent file format whose markup, or absence of markup, has been arranged to thwart or discourage subsequent modification by readers is not Transparent. An image format is not Transparent if used for any substantial amount of text. A copy that is not "Transparent" is called **"Opaque"**.

Examples of suitable formats for Transparent copies include plain ASCII without markup, Texinfo input format, LaTeX input format, SGML or XML using a publicly available DTD, and standard-conforming simple HTML, PostScript or PDF designed for human modification. Examples of transparent image formats include PNG, XCF and JPG. Opaque formats include proprietary formats that can be read and edited only by proprietary word processors, SGML or XML for which the DTD and/or processing tools are not generally available, and the machine-generated HTML, PostScript or PDF produced by some word processors for output purposes only.

The **"Title Page"** means, for a printed book, the title page itself, plus such following pages as are needed to hold, legibly, the material this License requires to appear in the title page. For works in formats which do not have any title page as such, "Title Page" means the text near the most prominent appearance of the work's title, preceding the beginning of the body of the text.

A section **"Entitled XYZ"** means a named subunit of the Document whose title ei-

ther is precisely XYZ or contains XYZ in parentheses following text that translates XYZ in another language. (Here XYZ stands for a specific section name mentioned below, such as **"Acknowledgements"**, **"Dedications"**, **"Endorsements"**, or **"History"**.) To **"Preserve the Title"** of such a section when you modify the Document means that it remains a section "Entitled XYZ" according to this definition.

The Document may include Warranty Disclaimers next to the notice which states that this License applies to the Document. These Warranty Disclaimers are considered to be included by reference in this License, but only as regards disclaiming warranties: any other implication that these Warranty Disclaimers may have is void and has no effect on the meaning of this License.

2. VERBATIM COPYING

You may copy and distribute the Document in any medium, either commercially or noncommercially, provided that this License, the copyright notices, and the license notice saying this License applies to the Document are reproduced in all copies, and that you add no other conditions whatsoever to those of this License. You may not use technical measures to obstruct or control the reading or further copying of the copies you make or distribute. However, you may accept compensation in exchange for copies. If you distribute a large enough number of copies you must also follow the conditions in section 3.

You may also lend copies, under the same conditions stated above, and you may publicly display copies.

3. COPYING IN QUANTITY

If you publish printed copies (or copies in media that commonly have printed covers) of the Document, numbering more than 100, and the Document's license notice requires Cover Texts, you must enclose the copies in covers that carry, clearly and legibly, all these Cover Texts: Front-Cover Texts on the front cover, and Back-Cover Texts on the back cover. Both covers must also clearly and legibly identify you as the publisher of these copies. The front cover must present the full title with all words of the title equally prominent and visible. You may add other material on the covers in addition. Copying with changes limited to the covers, as long as they preserve the title of the Document and satisfy these conditions, can be treated as verbatim copying in other respects.

If the required texts for either cover are too voluminous to fit legibly, you should put the first ones listed (as many as fit reasonably) on the actual cover, and continue the rest onto adjacent pages.

If you publish or distribute Opaque copies of the Document numbering more than 100, you must either include a machine-readable Transparent copy along with each Opaque copy, or state in or with each Opaque copy a computer-network location from which the general network-using public has access to download using public-standard network protocols a complete Transparent copy of the Document, free of added material. If you use the latter option, you must take reasonably prudent steps, when you begin

distribution of Opaque copies in quantity, to ensure that this Transparent copy will remain thus accessible at the stated location until at least one year after the last time you distribute an Opaque copy (directly or through your agents or retailers) of that edition to the public.

It is requested, but not required, that you contact the authors of the Document well before redistributing any large number of copies, to give them a chance to provide you with an updated version of the Document.

4. MODIFICATIONS

You may copy and distribute a Modified Version of the Document under the conditions of sections 2 and 3 above, provided that you release the Modified Version under precisely this License, with the Modified Version filling the role of the Document, thus licensing distribution and modification of the Modified Version to whoever possesses a copy of it. In addition, you must do these things in the Modified Version:

A. Use in the Title Page (and on the covers, if any) a title distinct from that of the Document, and from those of previous versions (which should, if there were any, be listed in the History section of the Document). You may use the same title as a previous version if the original publisher of that version gives permission.

B. List on the Title Page, as authors, one or more persons or entities responsible for authorship of the modifications in the Modified Version, together with at least five of the principal authors of the Document (all of its principal authors, if it has fewer than five), unless they release you from this requirement.

C. State on the Title page the name of the publisher of the Modified Version, as the publisher.

D. Preserve all the copyright notices of the Document.

E. Add an appropriate copyright notice for your modifications adjacent to the other copyright notices.

F. Include, immediately after the copyright notices, a license notice giving the public permission to use the Modified Version under the terms of this License, in the form shown in the Addendum below.

G. Preserve in that license notice the full lists of Invariant Sections and required Cover Texts given in the Document's license notice.

H. Include an unaltered copy of this License.

I. Preserve the section Entitled "History", Preserve its Title, and add to it an item stating at least the title, year, new authors, and publisher of the Modified Version as given on the Title Page. If there is no section Entitled "History" in the Document, create one stating the title, year, authors, and publisher of the Document as given

on its Title Page, then add an item describing the Modified Version as stated in the previous sentence.

J. Preserve the network location, if any, given in the Document for public access to a Transparent copy of the Document, and likewise the network locations given in the Document for previous versions it was based on. These may be placed in the "History" section. You may omit a network location for a work that was published at least four years before the Document itself, or if the original publisher of the version it refers to gives permission.

K. For any section Entitled "Acknowledgements" or "Dedications", Preserve the Title of the section, and preserve in the section all the substance and tone of each of the contributor acknowledgements and/or dedications given therein.

L. Preserve all the Invariant Sections of the Document, unaltered in their text and in their titles. Section numbers or the equivalent are not considered part of the section titles.

M. Delete any section Entitled "Endorsements". Such a section may not be included in the Modified Version.

N. Do not retitle any existing section to be Entitled "Endorsements" or to conflict in title with any Invariant Section.

O. Preserve any Warranty Disclaimers.

If the Modified Version includes new front-matter sections or appendices that qualify as Secondary Sections and contain no material copied from the Document, you may at your option designate some or all of these sections as invariant. To do this, add their titles to the list of Invariant Sections in the Modified Version's license notice. These titles must be distinct from any other section titles.

You may add a section Entitled "Endorsements", provided it contains nothing but endorsements of your Modified Version by various parties–for example, statements of peer review or that the text has been approved by an organization as the authoritative definition of a standard.

You may add a passage of up to five words as a Front-Cover Text, and a passage of up to 25 words as a Back-Cover Text, to the end of the list of Cover Texts in the Modified Version. Only one passage of Front-Cover Text and one of Back-Cover Text may be added by (or through arrangements made by) any one entity. If the Document already includes a cover text for the same cover, previously added by you or by arrangement made by the same entity you are acting on behalf of, you may not add another; but you may replace the old one, on explicit permission from the previous publisher that added the old one.

The author(s) and publisher(s) of the Document do not by this License give permission to use their names for publicity for or to assert or imply endorsement of any Modified Version.

5. COMBINING DOCUMENTS

You may combine the Document with other documents released under this License, under the terms defined in section 4 above for modified versions, provided that you include in the combination all of the Invariant Sections of all of the original documents, unmodified, and list them all as Invariant Sections of your combined work in its license notice, and that you preserve all their Warranty Disclaimers.

The combined work need only contain one copy of this License, and multiple identical Invariant Sections may be replaced with a single copy. If there are multiple Invariant Sections with the same name but different contents, make the title of each such section unique by adding at the end of it, in parentheses, the name of the original author or publisher of that section if known, or else a unique number. Make the same adjustment to the section titles in the list of Invariant Sections in the license notice of the combined work.

In the combination, you must combine any sections Entitled "History" in the various original documents, forming one section Entitled "History"; likewise combine any sections Entitled "Acknowledgements", and any sections Entitled "Dedications". You must delete all sections Entitled "Endorsements".

6. COLLECTIONS OF DOCUMENTS

You may make a collection consisting of the Document and other documents released under this License, and replace the individual copies of this License in the various documents with a single copy that is included in the collection, provided that you follow the rules of this License for verbatim copying of each of the documents in all other respects.

You may extract a single document from such a collection, and distribute it individually under this License, provided you insert a copy of this License into the extracted document, and follow this License in all other respects regarding verbatim copying of that document.

7. AGGREGATION WITH INDEPENDENT WORKS

A compilation of the Document or its derivatives with other separate and independent documents or works, in or on a volume of a storage or distribution medium, is called an "aggregate" if the copyright resulting from the compilation is not used to limit the legal rights of the compilation's users beyond what the individual works permit. When the Document is included in an aggregate, this License does not apply to the other works in the aggregate which are not themselves derivative works of the Document.

If the Cover Text requirement of section 3 is applicable to these copies of the Document, then if the Document is less than one half of the entire aggregate, the Document's Cover Texts may be placed on covers that bracket the Document within the aggregate, or the electronic equivalent of covers if the Document is in electronic form. Otherwise they must appear on printed covers that bracket the whole aggregate.

8. TRANSLATION

Translation is considered a kind of modification, so you may distribute translations of the Document under the terms of section 4. Replacing Invariant Sections with translations requires special permission from their copyright holders, but you may include translations of some or all Invariant Sections in addition to the original versions of these Invariant Sections. You may include a translation of this License, and all the license notices in the Document, and any Warranty Disclaimers, provided that you also include the original English version of this License and the original versions of those notices and disclaimers. In case of a disagreement between the translation and the original version of this License or a notice or disclaimer, the original version will prevail.

If a section in the Document is Entitled "Acknowledgements", "Dedications", or "History", the requirement (section 4) to Preserve its Title (section 1) will typically require changing the actual title.

9. TERMINATION

You may not copy, modify, sublicense, or distribute the Document except as expressly provided for under this License. Any other attempt to copy, modify, sublicense or distribute the Document is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

10. FUTURE REVISIONS OF THIS LICENSE

The Free Software Foundation may publish new, revised versions of the GNU Free Documentation License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns. See http://www.gnu.org/copyleft/.

Each version of the License is given a distinguishing version number. If the Document specifies that a particular numbered version of this License "or any later version" applies to it, you have the option of following the terms and conditions either of that specified version or of any later version that has been published (not as a draft) by the Free Software Foundation. If the Document does not specify a version number of this License, you may choose any version ever published (not as a draft) by the Free Software Foundation.

ADDENDUM: How to use this License for your documents

To use this License in a document you have written, include a copy of the License in the document and put the following copyright and license notices just after the title page:

> Copyright ©YEAR YOUR NAME. Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.2 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled "GNU Free Documentation License".

If you have Invariant Sections, Front-Cover Texts and Back-Cover Texts, replace the "with ... Texts." line with this:

> with the Invariant Sections being LIST THEIR TITLES, with the Front-Cover Texts being LIST, and with the Back-Cover Texts being LIST.

If you have Invariant Sections without Cover Texts, or some other combination of the three, merge those two alternatives to suit the situation.

If your document contains nontrivial examples of program code, we recommend releasing these examples in parallel under your choice of free software license, such as the GNU General Public License, to permit their use in free software.

H.2. The GNU General Public License

Version 2, June 1991
Copyright © 1989, 1991 Free Software Foundation, Inc.

51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA

Everyone is permitted to copy and distribute verbatim copies of this license document, but changing it is not allowed.

Preamble

The licenses for most software are designed to take away your freedom to share and change it. By contrast, the GNU General Public License is intended to guarantee your freedom to share and change free software—to make sure the software is free for all its users. This General Public License applies to most of the Free Software Foundation's software and to any other program whose authors commit to using it. (Some other Free Software Foundation software is covered by the GNU Library General Public License instead.) You can apply it to your programs, too.

When we speak of free software, we are referring to freedom, not price. Our General Public Licenses are designed to make sure that you have the freedom to distribute copies of free software (and charge for this service if you wish), that you receive source code or can get it if you want it, that you can change the software or use pieces of it in new free programs; and that you know you can do these things.

To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if you distribute copies of the software, or if you modify it.

For example, if you distribute copies of such a program, whether gratis or for a fee, you must give the recipients all the rights that you have. You must make sure that they, too, receive or can get the source code. And you must show them these terms so they know their rights.

We protect your rights with two steps: (1) copyright the software, and (2) offer you this license which gives you legal permission to copy, distribute and/or modify the software.

Also, for each author's protection and ours, we want to make certain that everyone understands that there is no warranty for this free software. If the software is modified by someone else and passed on, we want its recipients to know that what they have is not the original, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that redistributors of a free program will individually obtain patent licenses, in effect making the program proprietary. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

The precise terms and conditions for copying, distribution and modification follow.

GNU General Public License

Terms and Conditions For Copying, Distribution and Modification

0. This License applies to any program or other work which contains a notice placed by the copyright holder saying it may be distributed under the terms of this General Public License. The "Program", below, refers to any such program or work, and a "work based on the Program" means either the Program or any derivative work under copyright law: that is to say, a work containing the Program or a portion of it, either verbatim or with modifications and/or translated into another language. (Hereinafter, translation is included without limitation in the term "modification".) Each licensee is addressed as "you".

   Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running the Program is not restricted, and the output from the Program is covered only if its contents constitute a work based on the Program (independent of having been made by running the Program). Whether that is true depends on what the Program does.

1. You may copy and distribute verbatim copies of the Program's source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and give any other recipients of the Program a copy of this License along with the Program.

   You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

2. You may modify your copy or copies of the Program or any portion of it, thus forming a work based on the Program, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

   a) You must cause the modified files to carry prominent notices stating that you changed the files and the date of any change.

   b) You must cause any work that you distribute or publish, that in whole or in part contains or is derived from the Program or any part thereof, to be licensed as a whole at no charge to all third parties under the terms of this License.

   c) If the modified program normally reads commands interactively when run, you must cause it, when started running for such interactive use in the most ordinary way, to print or display an announcement including an appropriate copyright notice and a notice that there is no warranty (or else, saying that you provide a warranty) and that users may redistribute the program under these conditions, and telling the user how to view a copy of this License. (Exception: if the Program itself is interactive but does not normally print

such an announcement, your work based on the Program is not required to print an announcement.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Program, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Program, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Program.

In addition, mere aggregation of another work not based on the Program with the Program (or with a work based on the Program) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may copy and distribute the Program (or a work based on it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you also do one of the following:

   a) Accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

   b) Accompany it with a written offer, valid for at least three years, to give any third party, for a charge no more than your cost of physically performing source distribution, a complete machine-readable copy of the corresponding source code, to be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange; or,

   c) Accompany it with the information you received as to the offer to distribute corresponding source code. (This alternative is allowed only for noncommercial distribution and only if you received the program in object code or executable form with such an offer, in accord with Subsection b above.)

   The source code for a work means the preferred form of the work for making modifications to it. For an executable work, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the executable. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

If distribution of executable or object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place counts as distribution of the source code, even though third parties are not compelled to copy the source along with the object code.

4. You may not copy, modify, sublicense, or distribute the Program except as expressly provided under this License. Any attempt otherwise to copy, modify, sublicense or distribute the Program is void, and will automatically terminate your rights under this License. However, parties who have received copies, or rights, from you under this License will not have their licenses terminated so long as such parties remain in full compliance.

5. You are not required to accept this License, since you have not signed it. However, nothing else grants you permission to modify or distribute the Program or its derivative works. These actions are prohibited by law if you do not accept this License. Therefore, by modifying or distributing the Program (or any work based on the Program), you indicate your acceptance of this License to do so, and all its terms and conditions for copying, distributing or modifying the Program or works based on it.

6. Each time you redistribute the Program (or any work based on the Program), the recipient automatically receives a license from the original licensor to copy, distribute or modify the Program subject to these terms and conditions. You may not impose any further restrictions on the recipients' exercise of the rights granted herein. You are not responsible for enforcing compliance by third parties to this License.

7. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Program at all. For example, if a patent license would not permit royalty-free redistribution of the Program by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Program.

   If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply and the section as a whole is intended to apply in other circumstances.

   It is not the purpose of this section to induce you to infringe any patents or other property right claims or to contest validity of any such claims; this section has the sole purpose of protecting the integrity of the free software distribution system, which is implemented by public license practices. Many people have made generous contributions to the wide range of software distributed through that system in

reliance on consistent application of that system; it is up to the author/donor to decide if he or she is willing to distribute software through any other system and a licensee cannot impose that choice.

This section is intended to make thoroughly clear what is believed to be a consequence of the rest of this License.

8. If the distribution and/or use of the Program is restricted in certain countries either by patents or by copyrighted interfaces, the original copyright holder who places the Program under this License may add an explicit geographical distribution limitation excluding those countries, so that distribution is permitted only in or among countries not thus excluded. In such case, this License incorporates the limitation as if written in the body of this License.

9. The Free Software Foundation may publish revised and/or new versions of the General Public License from time to time. Such new versions will be similar in spirit to the present version, but may differ in detail to address new problems or concerns.

   Each version is given a distinguishing version number. If the Program specifies a version number of this License which applies to it and "any later version", you have the option of following the terms and conditions either of that version or of any later version published by the Free Software Foundation. If the Program does not specify a version number of this License, you may choose any version ever published by the Free Software Foundation.

10. If you wish to incorporate parts of the Program into other free programs whose distribution conditions are different, write to the author to ask for permission. For software which is copyrighted by the Free Software Foundation, write to the Free Software Foundation; we sometimes make exceptions for this. Our decision will be guided by the two goals of preserving the free status of all derivatives of our free software and of promoting the sharing and reuse of software generally.

No Warranty

11. Because the program is licensed free of charge, there is no warranty for the program, to the extent permitted by applicable law. Except when otherwise stated in writing the copyright holders and/or other parties provide the program "as is" without warranty of any kind, either expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The entire risk as to the quality and performance of the program is with you. Should the program prove defective, you assume the cost of all necessary servicing, repair or correction.

12. In no event unless required by applicable law or agreed to in writing will any copyright holder, or any other party who may modify

and/or redistribute the program as permitted above, be liable to you for damages, including any general, special, incidental or consequential damages arising out of the use or inability to use the program (including but not limited to loss of data or data being rendered inaccurate or losses sustained by you or third parties or a failure of the program to operate with any other programs), even if such holder or other party has been advised of the possibility of such damages.

End of Terms and Conditions

Appendix: How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the "copyright" line and a pointer to where the full notice is found.

<one line to give the program's name and a brief idea of what it does.>
Copyright (C) <year> <name of author>

This program is free software; you can redistribute it and/or modify it under the terms of the GNU General Public License as published by the Free Software Foundation; either version 2 of the License, or (at your option) any later version.

This program is distributed in the hope that it will be useful, but WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the GNU General Public License for more details.

You should have received a copy of the GNU General Public License along with this program; if not, write to the Free Software Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301, USA

Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this when it starts in an interactive mode:

Gnomovision version 69, Copyright (C) <year> <name of author>
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type

> 'show w'.
> This is free software, and you are welcome to redistribute it under certain conditions; type 'show c' for details.

The hypothetical commands `show w` and `show c` should show the appropriate parts of the General Public License. Of course, the commands you use may be called something other than `show w` and `show c`; they could even be mouse-clicks or menu items—whatever suits your program.

You should also get your employer (if you work as a programmer) or your school, if any, to sign a "copyright disclaimer" for the program, if necessary. Here is a sample; alter the names:

> Yoyodyne, Inc., hereby disclaims all copyright interest in the program 'Gnomovision' (which makes passes at compilers) written by James Hacker.
>
> <signature of Ty Coon>, 1 April 1989
> Ty Coon, President of Vice

This General Public License does not permit incorporating your program into proprietary programs. If your program is a subroutine library, you may consider it more useful to permit linking proprietary applications with the library. If this is what you want to do, use the GNU Library General Public License instead of this License.