



Rockbox User Manual

Make your box rock!

**Open Source jukebox firmware for the
Archos Jukebox 5000, 6000, Studio, Recorder, Recorder V2 and FM
Recorder MP3 players**

Website: <http://rockbox.haxx.se/>

Rockbox version 2.3
Manual release date 2004-07-14

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PART 1
GETTING STARTED

Welcome

This is the manual for Rockbox. Rockbox is a replacement firmware for the Jukebox Studio and Recorder players made by Archos. It is a complete rewrite of the software used to make the Jukeboxes play and record music, and contains many features and enhancements not available in the original firmware supplied by the manufacturer. Among the things that Rockbox has to offer are the following:

- Faster loading than the Archos firmware
- Uninterrupted playing of MP3 files – skipping is very rare
- More control over how your music is played
- Built in viewers for several common file types
- Sophisticated plugin system that allows the Jukebox to run games, a calendar, a clock, and many other applications.
- Totally removable and won't invalidate the Archos warranty
- Optional voice user interface for complete control without looking at the screen

Rockbox is a complete from scratch rewrite of the Jukebox software and uses no fragments of the original firmware. Not only is it free to use, it's also released under the GNU public license, which means that it will always remain free to both use and to change.

Getting more help





This manual is intended to be a comprehensive introduction to the Rockbox software. There is, however, more help available. The Rockbox website at <http://rockbox.haxx.se/> 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.

Before installation

Before you install Rockbox, you will need to know what model of Archos Jukebox you own. Rockbox comes in different versions depending on the model of your Jukebox. There are four different versions of the software. The table below will help you to identify which version of the software you need.

The model name is printed on the case. The hard drive size is listed on the serial number sticker on the back of the unit.

Please note that Rockbox does not currently run on the Archos Jukebox Multimedia or later Archos MP3 player products.

Picture	HD size	Model Name	Version Name
	5GB, 6GB, 10GB, 20GB	Jukebox 5000, Jukebox 6000, Jukebox Studio 10, Jukebox Studio 20	player
	6GB, 10GB, 15GB, 20GB	Jukebox Recorder 6, Jukebox Recorder 10, Jukebox Recorder 15, Jukebox Recorder 20	recorder
	20GB	Jukebox Recorder v2	recorderv2
	20GB	Jukebox Recorder FM	fmrecorder

Downloading Rockbox

The latest release of the Rockbox software will always be available from <http://rockbox.haxx.se/download/>. Windows users may wish to download the self-extracting Windows installer, which works for all Jukebox models, but those wishing to install manually or using a different operating system should choose the .ZIP archive containing the firmware for their model of the Jukebox.

Installing Rockbox

Using the Windows self installing executable to install Rockbox is the easiest method of installing the software on your Jukebox. Simply follow the onscreen instructions and select the appropriate drive letter and Jukebox model when prompted. You can use "Add / Remove Programs" to uninstall the software at a later date.

For non-Windows users and those wishing to install manually from the archive the procedure is still fairly simple. Connect your Jukebox to the computer via USB as described in the manual that came with your Jukebox. On Windows, the Jukebox drive will appear as a drive letter in your "My Computer" folder. Take the file that you downloaded above, and unpack its contents to your Jukebox drive. You can do this using a program such as [InfoZip \(http://www.info-zip.org/\)](http://www.info-zip.org/) or [WinZip \(http://www.winzip.org/\)](http://www.winzip.org/).

You will need to unpack all of the files in the archive onto your hard disk. If this has been done correctly, you will have a file called **archos.mod** (for the player) or **ajbrec.ajz** (for all other models) in the main folder of your Jukebox drive, and also a folder called **/.rockbox**, which contains a number of system files used by the

software.

Enabling Speech Support (optional)

If you wish to use speech support you will also need a language file, available from <http://rockbox.haxx.se/twiki/bin/view/Main/VoiceFiles/>. For the English language, the file is called **english.voice**. When it has been downloaded, unpack this file and copy it into the **lang** folder which is inside the **/.rockbox** folder on your Jukebox. Voice menus are turned on by default. See [Section 3](#) for details on voice settings.

Running Rockbox

Remove your Jukebox from the computer's USB port. Unplug any connected power supply and turn the unit off. When you next turn the unit on, the Jukebox firmware will start to load, and then it will load Rockbox for you. When you see the Rockbox splash screen, Rockbox is loaded and ready for use.

Uninstalling Rockbox

If you would like to go back to using the original Archos software, then connect the Jukebox up to your computer, and delete the **archos.mod** (players) or **ajbrec.ajz** (other models) file from the main folder of the Jukebox. If you wish to clean up your disk, you may also wish to delete the **/.rockbox** folder and its contents. Turn the Jukebox off and on and the normal Archos software will load.

PART 2
THE ROCKBOX INTERFACE

1 YOUR JUKEBOX

Throughout this manual, the buttons on the Jukebox are labelled according to the pictures below. There are minor cosmetic differences between Jukebox Recorder models, but the buttons are in approximately the same position whatever the model.



Jukebox Recorder



Jukebox Player

For further details about connecting, charging and caring for your Jukebox, please see the Archos manual that came with it.

2 FILE BROWSER



Recorder file browser



Player file browser

The file browser helps you navigate through the files on your Jukebox, entering folders and executing the default action on each file. To help us differentiate files, each file format is displayed with an icon. You can select which file types are displayed (see page 32).

2.1 CONTROLS

FOR THE RECORDER VERSION

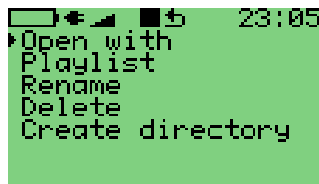
KEY	FUNCTION
UP/DOWN	Go to previous/next item in list. If you are on the first/last entry, the cursor will wrap to the last/first entry.
ON+UP/DOWN	Move one page up/down on the list.
LEFT	Go to the parent directory.
PLAY/RIGHT	Executes an action. Depending on the file type, that action may vary. (See Part III, section 2)
ON	If there is a MP3 playing, it returns to the While Playing Screen (WPS)
ON+PLAY	Enters the File Menu
F1	Switches to the Main Menu
F2	Switches to the Browse/play Quick Menu
F3	Switches to the Display Quick Menu

FOR THE PLAYER/STUDIO VERSION

KEY	FUNCTION
LEFT/RIGHT	Go to previous/next item in list. If you are on the first/last entry, the cursor will wrap to the last/first entry.
STOP	Go to the parent directory.
PLAY	Executes an action. Depending on the file type, that action may vary. (See Part III, section 2)
ON	If there is a MP3 playing, it returns to the While Playing Screen (WPS)
ON+PLAY	Enters the File Menu
Menu	Switches to the Main Menu

The functions of the F keys are also summarised on the button bar at the bottom of the screen.

2.2 FILE MENU



Recorder file menu



Player file menu

This menu operates on the file that was selected in the browser at the time ON+PLAY was pressed to enter it. It shows the following options:

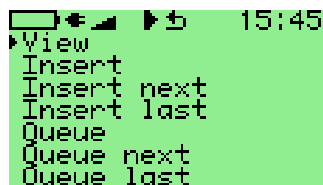
- **Open with:** Runs a viewer plugin on the file. Normally the filetype of a file is detected and the appropriate plugin is run automatically when you press play on it. Use this menu if for some reason you want to override the default action and select a viewer by hand. See the Viewers section of Part 4 for more details on viewers.

For example, this is how one would run the VBRfix plugin to recreate the Xing header for an MP3 file, which can fix problems such as fastforward and rewind not working correctly on a particular MP3 file or the play time of a track being listed incorrectly.

- **Playlist:** Change to the Playlist submenu (see below).
- **Rename:** This function lets the user modify a file name.
- **Delete:** Only files can be deleted, not folders. Rockbox will ask for confirmation before deleting a file. Press PLAY to confirm deletion or any other key to cancel.
- **Create Directory:** Makes a new folder in the current folder on the disk.

2.3 PLAYLIST SUBMENU

If the playlist submenu is invoked on a directory, it will act on all the files within that directory. If invoked on a playlist it will act on all the files in that playlist. Otherwise it acts only on the current file.



Recorder playlist submenu



Player playlist submenu

This menu provides the following options:

- **Insert:** Add track(s) to playlist. If no other tracks have been inserted then the selected track will be added immediately after current playing track, otherwise they will be added to end of insertion list.
- **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.
- **Queue:** Queue is the same as Insert except queued tracks are deleted immediately from the playlist after they've been played. Also, queued tracks are not saved to the playlist (see page 25).

- **Queue next:** Queue track(s) immediately after current playing track.
- **Queue last:** Queue track(s) at end of playlist.

You can insert a track, directory or playlist even if nothing is currently playing. In this case, a new playlist is created with only the selected tracks and then play is started.

Note: The dynamic playlist is saved so resume will restore it exactly as before shutdown. Stopped playlists can be resumed from File Browser by pressing ON.

2.4 VIRTUAL KEYBOARD



Recorder keyboard



Player Keyboard

This is the virtual keyboard that is used when entering file names in Rockbox.

FOR THE RECORDER VERSION

The recorder keyboard is similar in functionality to the player, but the larger screen makes editing a little more flexible.

KEY	FUNCTION
ARROW KEYS	Move about the virtual keyboard (moves the solid cursor)
ON+LEFT/RIGH	Move about within the current file name (moves the line cursor)
PLAY	Inserts the currently selected keyboard letter at the current filename cursor position
STOP	Exits the virtual keyboard without saving any changes
ON	No action
F1	SHIFT: Shifts between the upper case, lower case and accented keyboards
F2	OK: Exits the virtual keyboard and saves any changer
F3	DEL: Deletes the character before the current filename cursor

FOR THE PLAYER/STUDIO VERSION

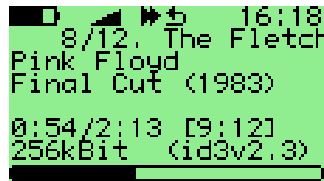
The current filename is always listed on the first line of the display. The second line of the display can contain the character selection bar, as in the screenshot above, or one of a number of other options.

KEY	FUNCTION
LEFT/RIGHT	Moves the arrow tp/from the filename and changes between the character bar and BACKSPACE, DELETE, ACCEPT and ABORT.
PLAY/STOP	Varies (see below)
ON	Nothing
Menu	Shift. When the character selection bar is selected this changes between upper case, lower case, and accented letters.

The function of the play and stop buttons depends on what the arrow is pointing to, as follows.

<i>SELECTED OPTION</i>	<i>PLAY/STOP FUNCTION</i>
filename	Moves the cursor left (STOP) or right (PLAY) within the filename
character bar	Moves the character bar to the next (PLAY) or previous (STOP) character.
BACKSPACE	PLAY deletes the character before the current cursor position
DELETE	PLAY deletes the character at the current cursor position
ACCEPT	PLAY exits the virtual keyboard and saves any changes
ABORT	PLAY exits the virtual keyboard and discards any changes

3 WHILE PLAYING SCREEN (WPS)



Recorder's WPS



Player's WPS

The While Playing Screen (WPS) displays various pieces of information about the currently playing MP3 file.

The display contains the following information by default:

Recorder

- Status bar: Battery level, charger status, volume, play mode, repeat mode, shuffle mode and clock
- Scrolling path+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 sidebar progress meter representing where in the song you are
- Peak meter

Notes:

- 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.

●

Player

- Playlist index/Playlist size: Artist - Title
- Current-time Progress-indicator Left

See page 59 for details of customising your WPS (While Playing Screen).

3.1 KEY CONTROLS

Key controls for the WPS (RECORDER):

KEY	ACTION
UP/DOWN	Volume up/down
LEFT	(quick press) Go to beginning of track, or if pressed while in the first seconds of a track, go to previous track
LEFT (hold)	Rewind in track
RIGHT	(quick press) Go to next track.
RIGHT (hold)	Fast forward in track.
PLAY	Toggle play/pause
ON	(quick press) Go to file browser
ON (hold)	Show pitch setting screen
STOP	Stop playback
F1	Go to Main menu
F2	Toggles Play/browse quick menu
F3	Toggles Display quick menu
F1+DOWN	Key lock on/off
F1+PLAY	Mute on/off
F1+ON	Enter ID3 viewer

Key controls for the WPS (PLAYER):

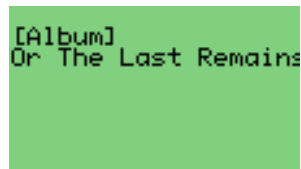
KEY	ACTION
MENU+RIGHT	Increases volume
MENU+LEFT	Decreases volume
LEFT	(quick press) Go to beginning of track, or if pressed while in the first seconds of a track, go to previous track.
LEFT (hold)	Rewind in track
RIGHT	(quick press) Go to next track.
RIGHT (hold)	Fast-forward in track.
PLAY	Toggle play/pause
ON	Quick press = Go to file browser
OFF	Stop playback
MENU	Go to Main menu
MENU+DOWN	Key lock on/off
MENU+PLAY	Mute on/off
MENU+ON	Enter ID3 viewer

3.2 PEAK METER (RECORDER ONLY)

The peak meter consists of several indicators

- **The bar:** That is the fat 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 doesn't show up during normal playback unless you play an audio file that is distorted heavily. If you encounter clipping while recording your recording will sound distorted. You should lower the gain. 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): 0db, -3db, -6db, -9db, -12db, -18db, -24db, -30db, -40db, -50db, -60db.

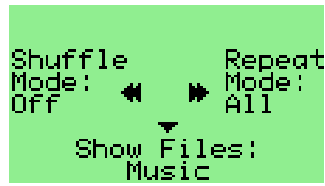
3.3 ID3 VIEWER



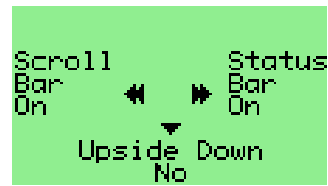
The ID3 viewer

This screen is accessible from the WPS screen by pressing F1+ON (recorder) or MENU+ON (player). It provides a detailed view of all the identity information about the current track that is stored in an MP3 file. Use the LEFT and RIGHT keys to move through the information and the STOP key to exit the viewer.

4 QUICK SCREEN MENUS (RECORDER ONLY)



F2 Quick Screen Menu



F3 Quick Screen Menu

Rockbox handles function buttons in a different way to the Archos software. F1 is always bound to the menu function, while F2 and F3 enable two quick menus.

F2 displays some browse and play settings which are likely to be changed frequently. These settings are Shuffle mode, Repeat mode and the Show files options

Shuffle mode plays each track in the currently playing list in a random order rather than in the order shown in the browser.

Repeat mode repeats either a single track (One) or the entire playlist (All).

Show files determines what type of files can be seen in the browser. This can be just MP3 files and directories (Music), Playlists, MP3 files and directories (Playlists), any files that Rockbox supports (Supported) or all files on the disk (All).

See page 31 for more information about these settings.

Key controls for F2:

KEY	ACTION
LEFT	Controls Shuffle mode setting
RIGHT	Controls Repeat mode setting
DOWN	Controls Show file setting

F3 controls frequently used display options.

Scroll bar turns the display of the Scroll bar on the left of the screen on or off.

Status bar turns the status display at the top of the screen on or off.

Upside down inverts the screen so that the top of the display appears nearest to the buttons. This is sometimes useful when storing the Jukebox in a pocket.

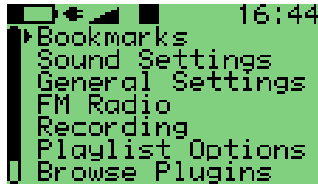
See page 32 for more information about these settings.

Key controls for F3:

KEY	ACTION
LEFT	Controls scroll bar display
RIGHT	Controls status bar display
DOWN	Controls inverted setting

PART 3
THE MAIN MENU

1 INTRODUCING THE MAIN MENU



Recorder main menu



Player main menu

This is the screen from which the rest of the Rockbox functions can be accessed. It is used for a variety of functions, which are detailed below. You can access the Rockbox main menu by pressing MENU (player/studio version) or F1 (recorder version) key. All options in Rockbox can be controlled via this menu. Some of them can also be found in the Quick Menus (recorder version only).

All settings are persistently stored on the unit. However, Rockbox does not spin up the disk solely for the purpose of saving settings, but instead will do it when it spins up the disk the next time, for example when refilling the MP3 buffer or navigating through the file browser. This is important to know since if you change a config setting and then immediately shut your unit down, the new configuration may not be saved.

The two settings menus are covered in detail starting on page 27. All the other options on the main menu are explained here.

Navigating through the menu:

PLAYER/STUDIO CONTROLS

KEY	ACTION
LEFT	Selects previous option in the menu. Inside an setting, decreases the value or chooses previous option
RIGHT	Selects next option in the menu. Inside an setting increases the value or chooses next option
PLAY	Selects item
STOP	Exit menu, setting or moves to parent menu.

RECORDER CONTROLS

KEY	ACTION
UP	Moves up in the menu. Inside a setting, increases the value or chooses next option
DOWN	Moves down in the menu. Inside a setting, decreases the value or chooses previous option
PLAY/RIGHT	Selects option
OFF/LEFT	Exits menu, setting or moves to parent menu

2 RECORDING (RECORDERS ONLY)

2.1 WHILE RECORDING SCREEN



Recording Screen



Recording F2 screen



Recording F3 screen

Entering the "Recording" option in the Main menu launches the recording application. The screen shows the time elapsed and the size of the file being recorded. A peak meter is present to allow you set Gain correctly. Frequency, channels and quality are shown on the last line.

The controls for this screen are:

BUTTON	FUNCTION
LEFT	Decreases Gain
RIGHT	Increases Gain
PLAY	Starts recording. While recording, button closes the current file and opens a new one
STOP	Exits Recording Screen. If Recording a file, stop recording
F1	Opens Recording Settings screen (see below)
F2	Quick menu for recording settings. A quick press will leave the screen up (press F2 again to exit), while holding it will close the screen when you release it.
F3	Quick menu for source setting. Quick/hold works as for F2.

2.2 RECORDING SETTINGS

● Quality

● Choose the quality here (0 to 7). Default is 5, best quality is 7, smallest file size is 0. This setting effects how much your sound sample will be compressed. Higher quality settings result in higher bit rate MP3 files.

● Frequency

● Choose the recording frequency (sample rate). 48kHz, 44.1kHz, 32kHz, 24kHz, 22.05kHz, 16kHz are available. Higher sample rates use up more disk space, but give better sound quality.

● **Source**

Choose the source of the recording. This can be microphone, line in, or SPDIF (digital). For recording from the radio on the FM recorder, see page24_below.

Note: you cannot change the sample rate for digital recordings.

● **Channels**

This allows you to select mono or stereo recording. Please note that for mono recording, only the left channel is recorded.

● **Independent Frames**

The independent frames option tells the Jukebox to encode with the bit reservoir disabled, so the frames are independent of each other. This makes a file easier to edit.

● **Time Split**

This option is useful when timing recordings. If set to active it stops a recording at a given interval and then starts recording again with a new file. This is useful for long term recordings.

The splits are seamless (frame accurate), no audio is lost at the split point. The break between recordings is only the time required to stop and restart the recording, on the order of 2-4 seconds.

Options (hours:minutes between splits): off, 24:00, 18:00, 12:00, 10:00, 8:00, 6:00, 4:00, 2:00, 1:00, 00:30, 00:15, 00:10, 00:05.

3 FM RADIO (FM RECORDERS ONLY)



FM radio screen

Switches to the radio screen.

The keys are:

BUTTON	FUNCTION
LEFT, RIGHT	Change frequency in 0.1 MHz steps. For automatic station seek, hold LEFT/RIGHT for a little longer.
UP, DOWN	Change volume
PLAY	(EXPERIMENTAL) freezes all screen updates, may enhance radio reception in some cases.
ON	Leave the radio screen with the radio playing
OFF	Back to main menu

Frequency settings (Presets):

● **Saving a preset**

You can save your favourite stations in the 32 presets. Press F1 to go to the menu, then select "Save preset". Enter the name (maximum number of characters is 32).

● **Selecting a preset**

Press F2 to go to the preset list. Use UP and DOWN to move the cursor and then press PLAY to select. Use LEFT to leave the preset without selecting anything.

● **Removing a preset**

Press F1 to go to the menu, then select "Remove preset".

● **Recording**

Press F3 to start recording the currently playing station. Press OFF to stop recording. Press PLAY again to seamlessly start recording to a new file. The settings for the recording can be changed in the F1 menu before starting the recording.

Note: The radio will turn off when playing an MP3.

4 BOOKMARKS

The bookmarks menu allows you to create and manage bookmark files.

● **Save Bookmark**

While playing a track, use this option to save your current position within the track so that you can return to it at a later time. Bookmarks are saved on a per folder basis i.e. all of the files in the same folder have their bookmarks stored together. You can store multiple bookmarks for the same track.

● **Load Bookmark**


```
10-look! no strings
Bookmark: 3/ 3
Index: 10
Time: 0:27
PLAY = Select
OFF = Exit
ON+Play = Delete
```

recorder bookmark browser



player bookmark browser

While playing a track, use this option to return to any bookmark in the current folder. The bookmark browser screen (shown above) is now displayed. Use the UP and DOWN keys (recorder) or LEFT and RIGHT keys (player) to navigate between bookmarks. Press PLAY to jump to a bookmark, ON+PLAY to delete a bookmark or STOP/OFF to exit the browser.

● **Recent bookmarks**

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. This option is off by default. See page 36 for more details on configuring bookmarking in Rockbox.

5 PLAYLIST OPTIONS

This menu allows you to work with playlists. Playlists can either be created automatically by playing a file in a directory directly, which will cause all of the files in that directory to be placed in the playlist, or they can be created by hand using the File Menu (see page 13) or using the Playlist Options menu. Both automatic and manually created playlists can be edited using this menu.

● **Create Playlists**

Rockbox will create a playlist with all tracks in the current directory and all subdirectories. The playlist will be created one directory level "up" from where you currently are.

● **Save Dynamic Playlist**

Saves the current dynamic playlist, excluding queued tracks, to the specified file. If no path is provided then playlist is saved to current directory (see page 13).

● **Recursively Insert Directories**

If set to ON then, when you insert/queue a directory in Dynamic Playlist, all subdirectories will also be inserted. If set to ASK then you are prompted about recursive insertion when inserting a directory.

6 BROWSE PLUGINS

With this option you can load and run various plugins that have been written for Rockbox.

A detailed description of the different plugins begins on page 38.

7 INFO

This option shows MP3 ram buffer size, battery voltage level and estimated time remaining, disk total space and disk free space.

On players use the left and right keys to step through several pages of information.

● **SHOW ID3 INFO**

This is an alternative way to access the ID3 viewer. See page 18 for details on the ID3 viewer.

● **VERSION**

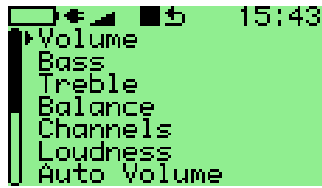
Software version and credits display.

● **DEBUG (KEEP OUT!)**

This submenu is intended to be used only by Rockbox developers. It shows hardware, disk, battery and a lot of other information. It is not recommended that users access this menu unless instructed to do so in the course of fixing a problem with Rockbox. In particular the "Dump ROM Contents", "View/clear RTC RAM" and "Screenshot" and "Sound test" functions should be treated with care.

PART 4
CONFIGURING ROCKBOX

1 SOUND SETTINGS



Recorder sound settings



Player sound settings

This menu offers a selection of sound properties you may change to improve your sound experience.

● Volume

The sound volume your music is played at. Although settable range is 0-100%, many units don't produce audible output below 40%.

● Bass

This emphasises or suppresses the lower (bass) sounds in the track. 0 means that bass sounds are unaltered (flat response).

● Treble

This emphasises or suppresses the higher (treble) sounds in the track. 0 means that treble sounds are unaltered (flat response).

● Balance

How much of the volume is generated by the left or right channel of the sound. 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.

● Channels

This option controls the onboard mixing facilities of the Jukebox. A stereo audio signal consists of two channels, left and right. Available options are

- **Mono Left:** Plays the left channel in both stereo channels.
- **Mono Right:** Plays the right channel in both stereo channels.
- **Mono:** Mix both channels down to mono and send the mixed signal to both channels.
- **Stereo:** Do not mix the signal
- **Stereo Narrow:** Mixes small amounts of the opposite channel into the left and right channels, thus making the sound seem closer together.
- **Stereo Wide:** Elements of one channel that are present in the opposite channel are removed from the latter. This results in the sound seeming further apart.
- **Karaoke:** Removes all sound that is the same in both channels. Since most vocals are recorded in this way to make the artist sound central, this often (but not always) has the effect of removing the voice track from a song.

● Loudness (Recorder only)

Loudness is an effect which emphasises bass and treble. This makes the track seem louder by amplifying the frequencies that the human ear finds hard to hear. Frequencies in the vocal range are unaffected, since the human ear picks these up

very easily.

● **Auto Volume** (Recorder only)

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. That time interval is configurable here. Short values like 20ms 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 less sharp changes in volume level.

● **Super Bass** (Recorder Only)

This setting boosts the volume of bass frequencies, making the sound of drums and bass guitar louder in comparison to the rest of the track. This setting only has an effect if Loudness is set to a value larger than 0dB.

● **MDB - Micronas Dynamic Bass** (Recorder Only)

The rest of the parameters on this menu relate to the Micronas Dynamic Bass (MDB) function. This 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 in believing it's hearing tones that the headphones or speakers aren't capable of reproducing. Try it and see what you think.

The MDB parameters are as follows.

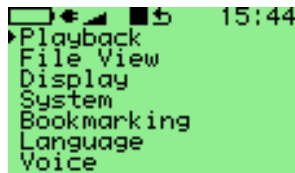
- **MDB enable:** this turns the MDB feature on or off. For many users this will be the only setting they need, since Rockbox picks sensible defaults for the other parameters. MDB is turned off by default.
- **MDB strength:** How loud the harmonics generated by the MDB will be.
- **MDB Harmonics:** The 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 time the centre frequency.

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

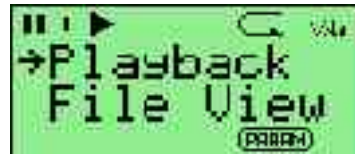
For most users, the defaults should provide an improvement in sound quality and can be safely left as they are. For reference, the defaults Rockbox uses are:

Setting	Value
MDB Strength	50dB
MDB Harmonics	48%
MDB Center frequency	60Hz
MDB Shape	90Hz

2 GENERAL SETTINGS



Recorder general settings



Player general settings

2.1 PLAYBACK OPTIONS

Here you configure all settings related to MP3 playback

● **Shuffle**

Select shuffle ON/OFF. This alters how Rockbox will select which next song to play.

● **Repeat**

Repeat modes are Off/One/All. "Off" means no repeat. "One" means repeat one track over and over. "All" means repeat playlist/directory.

● **Play Selected First**

This setting controls what happens when you press PLAY on a file in a directory and shuffle mode is on. If this 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.

● **Resume**

Sets whether Rockbox will resume playing at the point where you shut off. Options are: Ask/Yes/No/Ask once. "Ask" means it will ask at boot time. "Yes" means it will unconditionally try to resume. "No" means it will not resume. "Ask once" will erase the resume info if you answer no, and thus not ask you again.

● **FFwd / Rewind**

Two options are available at this point

● **FF/RW Min Step**

The smallest step, in seconds, you want to fast forward or rewind in a track.

● **FF/RW Accel**

How fast you want search (ffwd/rew) to accelerate when you hold down the button. "Off" means no acceleration. "2x/1s" means double the search speed once every second the button is held. "2x/5s" means double the search speed once every 5 seconds the button is held.

● **Anti-skip Buffer**

This setting is really "extra antiskip". It lets you set a timer for how many seconds earlier than normally necessary the disk should spin up and start reading data. You don't need this unless you shake and bump the unit a lot. Spinning up the disk earlier than necessary naturally drains the batteries a little extra. Most users will not need this setting.

● **Fade on Stop/Pause**

This setting enables and disables a fade effect when you pause or stop playing a

song. Fade is a progressive increase or reduction of volume, from your set volume to 0, and inverse.

2.2 FILE VIEW

This menu deals with options relating to how the file browser displays files

- **Sort Case Sensitive:** If this option is enabled files that start with a lowercase letter will appear after the files that start with an uppercase letter have all been listed. If disabled, then case will be ignored when sorting files.
- **Sort Directories:** This option controls how Rockbox sorts folders. The default is to sort them alphabetically. "By date" sorts them with the oldest folder first. "By newest date" sorts them with the newest folder first.
- **Sort Files:** This option controls how Rockbox sorts files. In addition to the options for directory sorting above, there is a "By type" option which sorts files alphabetically by their type (such as .mp3) then alphabetically within each type.
- **Show Files:** Controls which files are displayed in the dir browser:
 - **Music:** Only directories, .mp3, .mp2, .mpa and .m3u files are shown. Extensions are stripped. Files and directories starting with . or has the "hidden" flag set are hidden.
 - **Playlists:** Only shows directories and playlists, for simplified navigation.
 - **Supported:** All directories and files Rockbox understands (see page 75) are shown. Files and directories starting with . or have the "hidden" flag set are hidden.
 - **All:** All files and directories are shown. Extensions are shown. No files or directories are hidden.
- **Follow Playlist:** If Follow Playlist is set to "Yes", you will find yourself in the same directory as the currently playing file if you go to the Directory Browser from the WPS. If set to "No", you will stay in the same directory as you last were in.
- **Show Icons:** This indicates whether Rockbox will display an icon representing what type a file is on the left of the file in the browser. For details of these icons, please see page 75.

2.3 DISPLAY OPTIONS

● Browse fonts

Browse the fonts that reside in your /.rockbox directory. Selecting one will activate it. See page 59 for further details about fonts.

● Browse WPS files

Opens the file browser in the /.rockbox directory and displays all .wps files. Selecting one will activate it, stop will exit back to the menu.

For further information about the WPS see page 16. For information about editing a .WPS file see page 59.

● LCD Settings

This submenu contains settings that relate to the display of the Jukebox.

- **Backlight:** How long the backlight shines after a key press. Set to OFF to never light it, set to ON to never shut it off or set a preferred timeout period.
- **Backlight on When Plugged:** This option turns the backlight on constantly while the charger cable is connected.
- **Caption Backlight:** This option turns the backlight on briefly for 25 seconds either side of the start of a new track so that the display can be read to see what the next song is.
- **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 (Recorder only):** This setting lets you invert the whole screen, so now you get a black background and green text graphics.
- **Upside Down:** Displays the screen so that the top of the display is nearest the buttons. This is sometimes useful when carrying the Recorder in a pocket for easy access to the headphone socket.
- **Line Selector:** Select this option to have a bar of inverted text (Bar option) mark the current line in the File Browser rather than the default arrow to the left (Pointer option). This gives slightly more room for filenames.

● Scrolling

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

- **Scroll Speed:** Controls how many times per second the scrolling text moves a step.
- **Scroll Step Size:** Controls how many pixels the text scroll should move for each step. (Recorder only)
- **Scroll Start Delay:** Controls how many milliseconds Rockbox should wait before a new text begins scrolling.
- **Bidirectional Scroll Limit:** Rockbox has two different scroll methods, scrolling the text always to the left, and when the line has ended, begin again with the Start of the text, or move to the left until you can read the end of the line, and scroll right until you see the beginning of the text. Rockbox chooses which method it should use, depending of how much it has to scroll left. This setting lets you tell Rockbox where that limit is, expressed in percentage of line length.

● Status/Scrollbar (Recorder only)

Settings related to on screen status display and the scrollbar.

- **Scroll Bar:** Enables or disables the scroll bar at the left.
- **Status Bar:** Enables or disables the status bar at the upper side.
- **Button Bar:** Enables or disables the button bar prompts for the F keys at the bottom of the screen.
- **Volume Display:** Controls whether the volume is displayed as a graphic or a numerical percentage value on the Status Bar.
- **Battery Display:** Controls whether the battery charge status is displayed as a graphic or numerical percentage value on the Status Bar.

● Peak Meter (Recorder only)

The peak meter can be configured with a number of parameters. (For a description of the peak meter see page 18.)

- **Peak Release:** This determines how fast the bar shrinks when the music becomes softer. Lower values make the peak meter look smoother.
- **Peak Hold Time:** Specifies the time after which the peak indicator will reset. If you set this value e.g. to 5s then the peak indicator displays the loudest volume value that occurred within the last 5 seconds. Big values are good if you want to find the maximum value of a song. That might be an interesting value for copying music from the jukebox via the analog output to some other recording device.
- **Clip Hold Time:** How long should the clipping indicator be visible after clipping was detected?
- **Performance:** In high performance mode, the peak meter is updated as often as possible. That reduces the chance of missing a peak value, making the peak meter more precise. In energy save mode the peak meter is updated just often enough to look fluid. This reduces the load on the CPU and thus saves a little bit of energy. If you crave for every second of runtime of your jukebox or simply use the peak meter as a screen effect, the use of energy save mode is recommended. If you want to use the peak meter as a measuring instrument you'll want to use high performance mode.
- **Scale:** Select whether the peak meter displays linear or logarithmic values. In dB (decibel) scale the volume values are scaled logarithmically. This very similar to the perception of loudness. The volume meters of digital audio devices usually are scaled this way. If you are interested in the power that is applied to your headphones you should choose linear display. Unfortunately this value doesn't have real units like volts or watts since that depends on the phones. So they can only be displayed as percentage values.
- **Minimum and maximum range:** These two options define the full value range that the peak meter displays. Recommended values for dBfs are -40 for min. and 0 for maximum. For linear display, use 0 and 100%. Note that -40 dBfs is approximately 1% in linear value, but if you change the min setting in linear mode slightly and then change to dBfs you notice vast changes. You can use these values for 'zooming' into the peak meter.

2.4 SYSTEM OPTIONS

● Battery

Options relating to the batteries in the Jukebox unit.

- **Battery Capacity,** which can be used to tell the Jukebox what capacity (in mAh) of battery is being used inside it. The default is 1500mAh for NiMH battery based units, and 2300mAh for LiOn battery based units, which is the capacity value for the standard batteries shipped with these units. This value is used for calculating remaining battery life.
- **Deep discharge** (Non-FM recorders only)
Set this to ON if you intend to keep your charger connected for a long period of time. It lets the batteries go down to 10% before starting to charge again. Setting this to OFF will cause the charging to restart on 95%.
- **Trickle Charge** (Non-FM recorders only)

The jukebox cannot be turned off while the charger is connected. Therefore, trickle charge is needed to keep the batteries full after charging has completed. For more in depth information about charging see Battery FAQ in your /.rockbox/docs directory.

● **Disk**

Options relating to the hard disk.

● **Disk Spindown:** Rockbox has a timer that makes it spin down the hard disk after being idle for a certain time. You can modify this timeout here. This idle time is only affected by user activity, like navigating through file browser. When the hard disk spins up to fill mp3 buffer, it automatically spins down afterwards.

● **Disk Poweroff:** (non v2/FM-Recorders only) Whether the disk is powered OFF or only set to "sleep" when spun down. Power OFF uses less power but takes longer to spin-up.

● **Time and Date** (Recorder Only)

Time related menu options.

● **Set Time/Date:** Set current time and date.

● **Time Format:** Choose 12 or 24 Hour clock.

● **Idle Poweroff**

Rockbox can be configured to turn off power after the unit has been idle for a defined number of minutes. The unit is idle when playback is stopped or paused. It is not idle while the USB or charger is connected, or while recording.

● **Sleep Timer**

This option lets you power off your jukebox after playing for a given time. This setting is reset on boot.

● **Wake up alarm** (Recorder v2/FM only)

This option turns the Jukebox off and then starts it up again at the specified time. This is most useful when combined with the Resume setting in the Playback options set to "Yes", so that the Jukebox wakes up and immediately starts playing music. Use LEFT and RIGHT to adjust the minutes setting, UP and DOWN to adjust the HOURS. PLAY confirms the alarm and shuts your Jukebox down, and STOP cancels setting an alarm. If the Jukebox is turned on again before the alarm occurs the alarm will be canceled.

● **Limits**

This submenu relates to limits in the Rockbox operating system.

● **Max files in dir browser:** Configurable limit of files in dir browser (file buffer size). You can configure the dir size to between 50 and 10000 files in steps of 50 files. Default is 400, higher values will shorten the mpeg buffer.

Note: the device must be rebooted for the settings to take effect!

● **Max playlist size:** Option to configure the maximum size of a playlist. The playlist size can be between 1000 and 20000 files in steps of 1000. By default it's 10000.

Note: the device must be rebooted for the settings to take effect!

● **Car Adapter Mode**

This option turns on and off the car ignition auto stop function.

When using the Jukebox in a car, car adapter mode automatically stops playback on the Jukebox when power (i.e. from cigarette lighter power adapter) to the external DC in jack is turned off.

When the external power off condition is detected, the Car Adapter Mode function only pauses the playback. In order to shut down the Jukebox completely the Idle Poweroff function (see above) must be set.

If power to the DC in jack is turned back on before the Idle Poweroff function has shut the Jukebox off, playback will be resumed 5 seconds after the power is applied. This delay is to allow for the time while the car engine is being started. Once the Jukebox is shut off either manually, or automatically with the Idle Poweroff function, it must be powered up manually to resume playback.

● **Line In (Player only)**

This option activates the line in port on Jukebox Player, which is off by default. This is useful for such applications as:

- Game boy -> Jukebox -> human
- laptop -> Jukebox -> human
- LAN party computer -> Jukebox -> human

● **Manage settings**

This submenu deals with loading and saving settings.

- **Browse .cfg Files:** This displays a list of configuration (.cfg) files stored in the /.rockbox system directory. This is useful if the Jukebox is plugged into more than one different output device (e.g. Headphones, computer, car stereo, hi-fi) so that a settings file can be maintained for each.
- **Browse Firmwares:** This displays a list of firmware (.mod for Players or .ajz for Recorders) file in the /.rockbox system directory. Playing a firmware file loads it into memory. Thus it is possible to run the original Archos firmware or a different version of Rockbox from here assuming that you have the right files installed on your disk.
- **Reset Settings:** This wipes the saved settings in the Jukebox and resets all settings to their default values.
- **Write .cfg file:** Saves the current settings into a .cfg file for later use with Browse .cfg Files above.

2.5 BOOKMARKING

● **Bookmark on Stop**

Write a bookmark to the disk whenever the stop key is pressed. If playback is stopped it can be resumed easily at a later time.

● **Load Last Bookmark**

When this is on, Rockbox automatically returns to the position of the last bookmark within a file when it is played. If set to Ask, Rockbox will ask the user whether they want to start from the beginning or the bookmark. When set to no, playback

always starts from the beginning and the Bookmark file must be played or Load Bookmark selected from the Bookmarks submenu of the Main Menu while the file is playing.

● **Maintain a list of Recently Used Bookmarks**

If this option is turned on, Rockbox will store a list of Bookmarks that have been accessed recently. This is then accessible from the Recent Bookmarks option of the Bookmarks submenu of the Main Menu.

2.6 LANGUAGE

See all the different languages your Rockbox can "speak". Selecting one will activate it. Note: the language files must reside in your `/.rockbox/lang/` directory.

See page 59 for further details about languages.

2.7 VOICE

● **Voice Menus**

This option turns on the Voice User Interface, which will read out menu items and settings as they are selected by the cursor. In order for this to work, a voice file must be present in the `/.rockbox/lang/` directory on the recorder. Voice files are large (1.5MB) 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. It will do nothing unless the appropriate `.voice` file is installed in the correct place on the Jukebox.

● **Voice Directories**

This option turns on the speaking of directory names. The Jukebox is not powerful enough to produce these voices in real time, so a number of options are available.

● **While Hovering:** Use special pre-recorded MP3 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.

● **On Enter:** Play `_dirname.talk` on entry to the actual directory (i.e. when PLAY is pressed on it).

● **Spell:** Speak the directory name by spelling it out letter by letter. Support is provided only for the most common letters 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.

● **Voice Filenames**

This option turns on the speaking of directory names. The options provided are "Spell", "Numbers", and "Off" which function the same as for Voice Directories.

PART 5 PLUGINS

Plugins are little programs that Rockbox can load and run. Plugins have the file extension .rock. Most of them can be started from the main menu if you put them in the /.rockbox/rocks directory. Press PLAY on them to start them.

Viewer plugins get started automatically by "playing" an associated file (i.e. text files, chip8 games), or from the "Open with" option on the File menu.

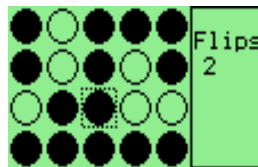
The plugin loader

Only one plugin can be loaded at a time. Plugins run in the GUI thread and have exclusive control over the user interface. This means you cannot switch back and forth between a plugin and Rockbox. A plugin is loaded, ran and then exited, which returns control to Rockbox. Music will carry on playing whilst plugins are being run.

1 GAMES

See also the Chip-8 emulator on page 50.

1.1 FLIPIT (RECORDER ONLY)

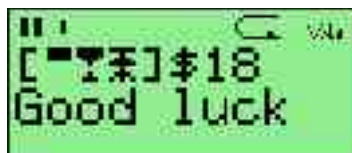


Flipit plugin

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	Changes the cursor
PLAY	Toggle
F1	Shuffle
F2	Solution
F3	Step by step
OFF	Stop the game

1.2 JACKPOT (PLAYER ONLY)



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
PLAY	Play
STOP	Exit the game

1.3 NIM (PLAYER ONLY)



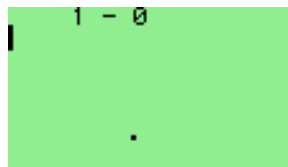
Nim plugin

Rules of Nim: There are 21 matches. Two players (you and the Jukebox) alternately pick a certain number of matches and the one who takes the last match, loses.

You can take up to twice as many matches as the Jukebox selected, and vice versa.

KEY	ACTION
-	Decrease the number of matches
+	Increase the number of matches
PLAY	Remove the number of matches you have selected
STOP	Exit the game

1.4 PONG (RECORDER ONLY)

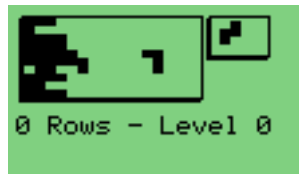


Pong game

The world's first arcade game comes to Rockbox. This is a "tennis game" for two players. The left player uses LEFT and F1 to move and the right player uses RIGHT and F3. The aim is to prevent the ball leaving the screen. The player that loses the least balls wins.

KEY	ACTION
F1	Player 1 up
LEFT	Player 1 down
F3	Player 2 up
RIGHT	Player 2 down
OFF	Quit

1.5 ROCKBLOX (RECORDER ONLY)



Rockblox plugin

This well-known game will probably be familiar. The aim of the game is to complete rows with the given pieces (blocks). Pieces can be rotated to make them fit into the rows. Once you complete a row, it gets cleared, but if you fill your display with rows you lose.

The controls for this game are:

KEY	ACTION
UP	Rotate piece
LEFT/RIGHT	Move piece to the left/right
DOWN	Move faster the piece downwards
OFF	Exit Tetris

1.6 SLIDING PUZZLE (RECORDER ONLY)



Sliding puzzle

The classic sliding puzzle game. Rearrange the pieces so that you can see the whole picture.

Key controls:

KEY	ACTION
UP/DOWN/LEFT/RIGHT	Moves
F1	Shuffle
F2	Change the picture
OFF	Stop the game

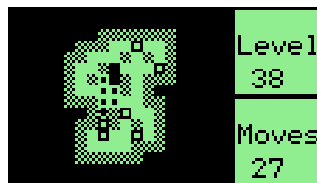
1.7 SNAKE (RECORDER ONLY)

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.

Change levels with UP/DOWN keys (level 1 is slowest, level 9 is fastest).

Press PLAY to start or pause.

1.8 SOKOBAN (RECORDER ONLY)



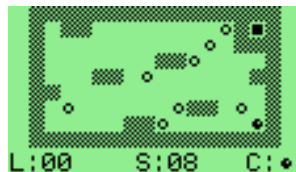
Screenshot of Sokoban

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.

The controls are:

KEY	ACTION
UP/DOWN/LEFT/RIGHT	Move the "sokoban" up, down, left or right
F1	Back to previous level
F2	Restart level
F3	Go to next level
ON	Undo last movement
OFF	Exit sokoban

1.9 STAR (RECORDER ONLY)



Star game

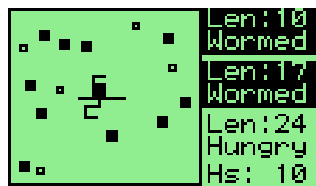
This is a puzzle game. It is actually a rewrite of Star, a game written by CDK designed for the hp48 calculator.

Rules: Take all of the "o"s to go to the next level. The on key allows you to switch 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.

Keys:

KEY	ACTION
ON	Toggle control
F1	Previous level
F2	Reset level
F3	Next level
OFF	Exit the game

1.10 WORMLET (RECORDER ONLY)



Wormlet game

Wormlet is a multi-user 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.

For 2-player games a remote control is not necessary but recommended. If you try to hold the Jukebox in the four hands of two players you'll find out why. Games with three players are only possible using a remote control.

Wormlet main menu controls:

KEY	ACTION
UP/DOWN	Selects number of players
LEFT/RIGHT	Controls number of worms on the game
F1	Selects game mode.

Game controls:

Players	MODES	PLAYER 1	PLAYER 2	PLAYER 3
0	Out of control	With no player taking part in the game all worms are out of control and steered by artificial stupidity.		
1	2 key control	on Jukebox LEFT: turn left RIGHT: turn right	-	-
	4 key control	on Jukebox LEFT: turn left UP: turn up RIGHT: turn right DOWN: turn down	-	-
2	Remote control	on Jukebox LEFT: turn left RIGHT: turn right	on remote control VOL DOWN: turn left VOL UP: turn right	-
	No remote control	on Jukebox LEFT: turn left RIGHT: turn right	on Jukebox F2: turn left F3: turn right	-
3	Remote control	on Jukebox LEFT: turn left RIGHT: turn right	on remote control VOL DOWN: turn left VOL UP: turn right	on Jukebox F2: turn left F3: turn right

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's 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 the PLAY key to pause the game. Hit PLAY 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 the OFF button. 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 the ON button. This freezes the game. If you hit the ON button again a new game starts with the same configuration. To return to the games menu you can hit the OFF button. 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 it's 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's good to have a hungry worm since it means that your worm is alive. But it's 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's your job to say "Argh!" aloud.

● **Wormed:**

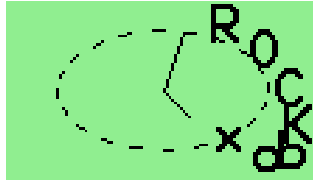
The worm tried to eat another worm or even itself. That's why it's dead now. Making traps for other players with a worm is a good way to get them out of the game.

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.
- While playing the game the Jukebox can still play music. For single player game use any music you like. For berserk games with 2 players use hard rock and for 3 player games use heavy metal or X-Phobie (<http://www.x-phobie.de>). Play fair and don't kick your opponent in the toe or poke him in the eye. That's would be bad manners.

2 DEMOS

2.1 BOUNCE (RECORDER ONLY)



The bounce Demo

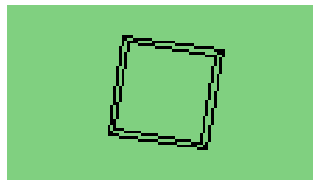
This demo is an analog clock screen saver with "Rockbox" bouncing across the screen. Key controls for this demo are:

KEY	ACTION
F1/F2/F3	Enters Bounce configuration options
UP/DOWN	Moves to next/previous option
LEFT/RIGHT	Increases/decreases option value
ON	Changes to Scroll mode
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.

2.2 CUBE (RECORDER ONLY)



Cube

This is a rotating cube screen saver in 3D. To see it at full speed, press PLAY and it will run at maximum frame rate. Also you can change the size of the x, y and z axis using LEFT, RIGHT, UP, DOWN, F1 and F2.

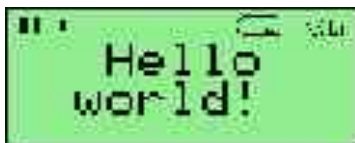
2.3 GREYSCALE (RECORDER ONLY)



Greyscale

This is a demonstration of the Rockbox greyscale engine which supports graphics on the Jukebox. Press OFF to quit the demo.

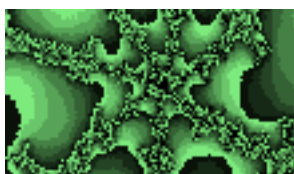
2.4 HELLO WORLD (ALL MODELS)



Hello world!

This is plugin demo for hackers. Every programmer's first program is the helloworld-program which does nothing except displaying "Hello world!" on the screen.

2.5 MANDELBROT (RECORDER ONLY)



Mandelbrot

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

KEY	ACTION
Arrow keys	Move about the image
PLAY	Zoom in
OFF	Quit
F1	Increase iteration depth (more detail)
F2	Decrease iteration depth (less detail)
F3	Reset and return to the default image

2.6 MOSAIC (RECORDER ONLY)



Mosaic

This simple graphics demo draws a mosaic picture on the screen of the Jukebox. Press STOP to quit.

2.7 OSCILLOGRAPH (RECORDER ONLY)



Oscillograph

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

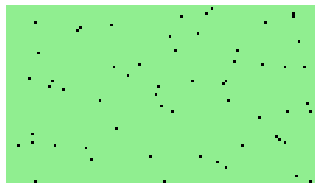
There are two mechanisms to alter speed.

- Slowing down is achieved by increasing the time waiting for user input. This mechanism uses positive values.
- Speeding up is achieved by leaving out the user input check for (-speed) volume samples. For this mechanism negative values are used.

Key controls:

KEY	ACTION
F1	toggles whether to scroll or not
F2	toggles filled / curve / plot
F3	reset speed to 0
UP	slow down scrolling
DOWN	Speeds up scrolling
PLAY	Pauses the demo
OFF	Exits demo

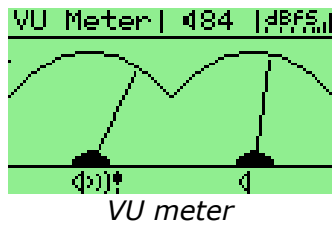
2.8 SNOW (RECORDER ONLY)



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.

2.9 VU METER (RECORDER ONLY)



This is a VU meter as a plugin. It has two needles for the left and the right channels. Currently it works on a linear scale, but in a future release it might have a logarithmic (dB) scale too.

3 VIEWERS

Viewers are plugins which are associated with specific file extensions. So you can't execute the plugin directly, but "play" the associated file.

3.1 CHIP-8 EMULATOR (RECORDER ONLY)

The Chip-8 Emulator allows you to play many old chip8 games found on the Net. It modifies Rockbox, so file extensions .ch8 will be recognised as chip8 games. Just press PLAY on a .ch8 file to start a game.

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 64x32 pixel graphics, and the new superchip emulator supports 128x64 graphics, which could almost fit on the Jukebox recorder's display. The only problem is they are based on a 4x4 keyboard, but since most games do not use all of the buttons, that could easily be worked around.

Some places where you can find .ch8 files:

- The original chip8 patch had several attached:
http://sourceforge.net/tracker/index.php?func=detail&aid=628509&group_id=44306&atid=439120
- Check out the HP48 chip games section: <http://www.hpcalc.org/hp48/games/chip/>
- Check out the PC emulator by the guy who wrote the HP48 emulator:
<http://www.pdc.kth.se/~lfo/chip8/CHIP8.htm>
- Links to other chip8 emulators:
<http://www.zophar.net/chip8.html>

3.2 JPEG VIEWER (RECORDER ONLY)

Press PLAY on a .JPG or .JPEG file in order to view the contents using Rockbox's greyscale library. Use the arrow keys to move around the image, PLAY to zoom in and ON to zoom out. Press OFF to exit the viewer.

Note: JPEGs that use progressive scan encoding are not supported and will produce an error.

3.3 MOVIE PLAYER (RECORDER ONLY)

Play movies on your Jukebox! 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 <http://rockbox.haxx.se/twiki/bin/view/Main/VideoTutorial>

3.4 ROCKBOX-FLASH (RECORDER ONLY)

```
Flash size: 256 KB
Image at 80 KB

Checked:
File OK.

[F2] to program
other key to exit
```

For "playing" .UCL files on flashed Rockboxes. Reprograms the flash memory of the Jukebox unit (see page 68 for details).

3.5 TEXT VIEWER (ALL MODELS)

This is a Viewer for text files with word wrap. Just press PLAY on a .TXT file to display it. Has controls to handle various styles of text formatting. Has top-of-file and bottom-of-file buttons. You can view files without a .TXT extension by using "Open with .." from the Play Screen menu

Controls

F1 (recorder) / ON-LEFT (player): toggles Word mode between Wrap and Chop:

- Wrap breaks lines at white space or hyphen.
- Chop breaks lines at the maximum column limit.

F2 (recorder) / ON-MENU-RIGHT (player): cycles Line mode through Normal, Join and Expand:

- Normal breaks lines at newline characters.
- Join ignores unpaired newline characters (i.e., joins lines). Useful for adopting the orphans that occur with e-mail style (i.e., pre-wrapped) text files.
- Expand doubles unpaired newlines (i.e., adds a blank line). Useful for making the paragraphs clearer in some book style text files.

F3 (recorder) / ON-RIGHT (player): toggles View mode between Narrow and Wide:

- Narrow sets maximum column to the screen width.
- Wide sets maximum column to 114. Useful for navigating large files. (Currently, Wide and Join cannot be selected together.)

ON-F1 (recorder only): toggles Page mode between Normal and Overlap:

- Normal sets page-down/page-up to one full screen.
- Overlap tells page-down/page-up to retain one line from previous screen.

ON-F3 (recorder only): toggles Scrollbar mode, for the current View mode.

- Narrow mode has no scrollbar by default, until toggled.
- Wide mode has a scrollbar by default, until toggled.
- If file fits on one screen, there is no scrollbar and ON-F3 has no effect.

Settings are remembered until the Jukebox is powered off.

Navigation

Recorder key controls:

KEY	ACTION
UP	Page-up (one screen up)
DOWN	Page-down (one screen down)
LEFT	Top of file (Narrow mode)
	One screen left (Wide mode)
RIGHT	Bottom of file (Narrow mode)
	One screen right (Wide mode)
ON-UP	One line up
ON-DOWN	One line down
ON-LEFT	One column left
ON-RIGHT	One column right
OFF	Exit text viewer

Player key controls:

KEY	ACTION
LEFT	Page-up (one screen up)
RIGHT	Page-down (one screen down)
MENU LEFT	Top of file (Narrow mode)
	One screen left (Wide mode)
MENU RIGHT	Bottom of file (Narrow mode)
	One screen right (Wide mode)
STOP	Exit text viewer

Compatibility

- Correctly reads plain text files in Unix, Win/DOS, or Macintosh format. Latin-alphabet Unicode files are `a l m o s t r e a d a b l e`.
- Currently prefers fixed-width fonts. With proportional fonts, pretends all characters are the width of a lower-case 'o'.
- Currently messages are in English (please help with translations!)
- Does not currently support right-to-left languages.

3.6 VBRfix (ALL MODELS)

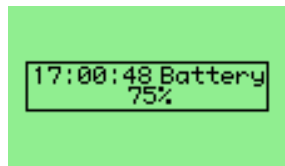
This function scans a VBR (Variable Bitrate) MP3 file and updates/creates the Xing VBR header. The Xing header contains information about the VBR stream used to calculate average bit rate, time information and to more accurately fwd/rew in the stream.

This function is especially useful when the playback of a file skips, fwd/rew does not work correctly or the time display is incorrect. Run VBRfix on files you record with your Jukebox. The header is not present in the recorded files and VBRfix adds this header.

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.

4 APPLICATIONS

4.1 BATTERY_TEST (ALL MODELS)



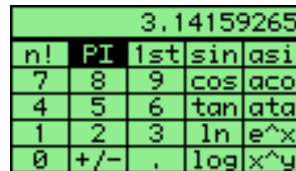
Recorder battery test



Player battery test

This plugin simulates normal power drain by spinning up the disk and reading a big file once ever 90 seconds (or thereabout). Each spinup also writes the battery level to a log file. The test stops when battery level reaches 4% in order to avoid being unable to write to the disk. The power usage data is saved to a file in the root directory of the Jukebox. This plugin can sometimes be useful for diagnosing problems with battery charging.

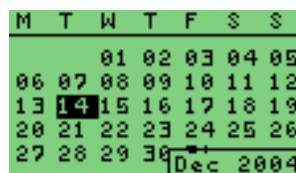
4.2 CALCULATOR (RECORDER ONLY)



Calculator

This is a simple scientific calculator for use on the Jukebox. It works like a standard calculator. Move using the arrow keys and press PLAY to press a button. Pressing the "1st" button will toggle between other available functions on the right hand side.

4.3 CALENDAR (RECORDER ONLY)



Calendar

This is a small and simple calendar app with memo saving function.

Dots indicate dates with memos. To add a new memo press PLAY on the date. Includes one off, annual, monthly, and weekly memos:

KEY	ACTION
PLAY	monthly
LEFT	weekly
RIGHT	annually
ON	one off
STOP	exit

4.4 CHESS CLOCK (PLAYER ONLY)



Chess Clock

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

Setup

- First enter the number of players (1-10) (press PLAY to continue).
- Then set the total game time in mm:ss (press PLAY to continue, STOP to go back).
- 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. (press PLAY to continue).
- Done. Player 1 starts in paused mode. So press PLAY to start.

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:

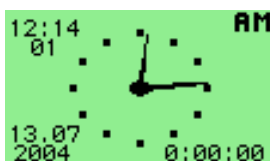
KEY	ACTION
ON	exits the plugin
NEXT	switch to the next player
STOP	restart round for the current player
PLAY	pause the time (play to continue)
MENU	enter a simple menu

In the menu you can 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. That player will then be removed from the timer.

4.5 CLOCK (RECORDER ONLY)



Clock

This is a fully featured analogue and digital clock program.

Key configuration

KEY	ACTION
F1	Help
F2	Start / Stop stopwatch
F2 (Hold down)	Reset stopwatch
F3	Options
Play	Select clock mode
UP	Enable idle poweroff
DOWN	Disable idle poweroff
RIGHT	Enable backlight
LEFT	Disable backlight
OFF	Save settings to disk and exit

Backlight configuration

If RIGHT or LEFT is not pressed during clock operation (with the exception of at the Help/Options/Mode Selector/Credit screens) then the Backlight timeout will remain your Rockbox default setting (example, 15 seconds). If RIGHT or LEFT is pressed, Clock will set the backlight to ON or OFF, respectively. When Clock is exited, your default Rockbox setting for Backlight will be restored.

Saving Settings

Settings are saved to disk when Clock is exited. They are saved to `"/.rockbox/rocks/.clock_settings"`. To reset your settings back to the defaults, simply navigate to this file using Rockbox, highlight it, and press the ON+PLAY keys to get the Delete option. This way you can feel free to experiment with the settings - and you could even load separate settings, say, one for your desk at home and one for in the car - by keeping two files in your `/.rockbox/rocks` folder such as `"h.clock_settings"` and `"c.clock_settings"`. Simply remove the `"h"` for your home settings to go into effect, or add the `"h"` back and take off the `"c"` for your car settings.

In the future, loading different settings will probably be made easier through a built-in settings file loader in Clock.

4.6 FAVORITES (ALL MODELS)



favourites

When listening to any song you can select Main Menu->Save Favorite and it will add the current song to a special playlist of all songs you selected in `/favorites.m3u`.

4.7 FIRMWARE_FLASH (RECORDER ONLY)

```
Flash: M=BF D=D6
SST39VF020
Size: 256 KB
using file:
/firmware_fm.bin

[F1] to check file
other key to exit

Firmware_flash
```

Use when flashing Rockbox (see page 70). In the ideal case, you'll need this tool only once. For security reasons you may wish to delete firmware_flash.rock once flashing is complete.

4.8 METRONOME (RECORDER ONLY)

This plugin can be used as a metronome to keep time during music practice. UP and DOWN increase and decrease the volume of the sound. RIGHT and LEFT increase and decrease the speed of the sound (beats per minute).

4.9 STOPWATCH (ALL MODELS)

```
0:01:38.90
2 0:01:23.40
1 0:01:06.35
```

Recorder stopwatch

```
" " " "
0:01:54.80
1 0:01:16
```

Player stopwatch

A simple stopwatch program with support for saving times.

Keys are as follows:

KEY	ACTION
PLAY	Start / Stop the timer
MENU	Save the current time (and keep going)
STOP	Quit the stopwatch

PART 6
ADVANCED TOPICS / REFERENCE

1 CUSTOMIZING THE USER INTERFACE

1.1 LOADING FONTS (RECORDER ONLY)

Rockbox can load fonts dynamically. Simply copy the .fnt file to the disk and "play" them in the directory browser or from the Main Menu > General Settings > Fonts.

If you want a font to be loaded automatically every time you start up, it must be located in the /.rockbox folder and the file name must be at most 24 characters long.

Any BDF font file up to 16 pixels high should be usable with Rockbox. To convert from bdf to fnt, use the convbdf tool. This tool can be found on Rockbox website (Linux: <http://rockbox.haxx.se/fonts/convbdf>, Windows: <http://rockbox.haxx.se/fonts/convbdf.exe>).

1.2 LOADING LANGUAGES

Rockbox can load language files at runtime. Simply copy the .lng file (not the .lang file) to the Jukebox and "play" it in the Rockbox directory browser or from the Main Menu -> General Settings -> Languages.

If you want a language to be loaded automatically every time you start up, it must be located in the /.rockbox folder and the file name must be max. 24 characters long.

Rockbox supports many different languages. You can get.lng files at <http://rockbox.haxx.se/lang/>. Currently all of these languages are included in the Rockbox distribution.

If your language is not yet supported and you want to write your own language file, follow these instructions:

- Copy the <http://rockbox.haxx.se/lang/english.lng> file and start filling in the "new:" lines.
- Name your file <language>.lng, where <language> is the local name for your language. I.e. svenska.lng, francais.lng etc.
- When you are done, submit your .lng file to Rockbox patch tracker. (http://sourceforge.net/tracker/?group_id=44306&atid=439120)

2 CONFIGURING THE WPS

Description / General Info

- The Custom While Playing Screen (WPS) display is used on both the Player and Recorder as a means to customize the WPS to the user's likings.
- After editing the .wps file, "play" it to make it take effect.
- The file may be 2 lines long for the Player, and 13 lines for the Recorder.
- All characters not preceded by % are displayed as typed.
- Lines beginning with # are comments and will be ignored.

File Location

Custom WPS files may be located anywhere on the drive. The only restriction is that they must end in .wps. When you press PLAY on a .wps file, it will be used for future WPS screens. If the "played" .wps file is located in the /.rockbox folder, it will be remembered and used after reboot. The .wps filename must be no more than 24

characters long for it to be remembered.

Tags

● ID3 Info Tags:

%ia : ID3 Artist

%ic : ID3 Composer

%id : ID3 Album Name

%ig : ID3 Genre Name

%in : ID3 Track Number

%it : ID3 Track Title

%iy : ID3 Year

%iv : ID3 Version (1.0, 1.1, 2.2, 2.3, 2.4 or empty if no id3 tag)

● Battery Info:

%bl : Show numeric battery level in percent

%bt : Show estimated battery time left

● File Info Tags:

%fb : File Bitrate (in kbps)

%ff : File Frequency (in Hz)

%fm : File Name

%fn : File Name (without extension)

%fp : File Path

%fs : File Size (In Kilobytes)

%fv : "(vbr)" if variable bit rate or "" if constant bit rate

%d1 : First directory from end of file path.

%d2 : Second directory from end of file path.

%d3 : Third directory from end of file path.

Example for the the %dN commands: If the path is /Rock/Kent/Isola/11 -747.mp3, %d1 is "Isola", %d2 is "Kent", %d3 is 'Rock'.

● Playlist/Song Info Tags:

%pb : Progress Bar

Player: This will display a 1 character "cup" that empties as the song progresses.

Recorder: This will replace the entire line with a progress bar.

%pf : Player: Full-line progress bar + time display

%pc : Current Time In Song

%pe : Total Number of Playlist Entries

%pm : Peak Meter (Recorder only) - the entire line is used as volume peak meter.

%pn : Playlist Name (Without path or extension)

%pp : Playlist Position

%pr : Remaining Time In Song

%ps : Shuffle. Shows 's' if shuffle mode is enabled.

%pt : Total Track Time

%pv : Current volume

● Conditional Tags (If/Else block):

%?xx<|> : Conditional: if the tag specified by "xx" has a value, the text between the "<" and the "|" is displayed, else the text between the "|" and the ">" is displayed. 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.

● 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 uppercase 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.

Take note that 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 (%t3.5).

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.

● Other Tags:

%% : Display a '%'

%< : Display a '<'

%| : Display a '|'

%> : Display a '>'

%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 10 scrolling

lines. Scrolling lines can not contain dynamic content such as timers, peak meters or progress bars.

Example File

```
%s%pp/%pe: %?it<%it|%fn> - %?ia<%ia|%d2> - %?id<%id|%d1>
%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]".

Default

If you haven't selected a .wps file in the /.rockbox directory, you get the hard coded wps layout. The default WPS screen is for player:

```
%s%pp/%pe: %?it<%it|%fn> - %?ia<%ia|%d2> - %?id<%id|%d1>
%pc%?ps<*/>%pt
```

And for recorder:

```
%s%?it<%?in<%in. |>%it|%fn>
%s%?ia<%ia|%?d2<%d2|(root)>>
%s%?id<%id|%?d1<%d1|(root)>> %?iy<(%iy)|>

%pc/%pt [%pp:%pe]
%fbkBit %?fv<avg|> %?iv<(id3v%iv)|(no id3)>
%pb
%pm
```

3 BUILDING YOUR OWN SETTINGS FILE

A .cfg file is used to load settings from a plain text file. A .cfg file may reside anywhere on the hard disk. The only restriction is that the filename must end in .cfg

Hint: Use the "Write .cfg file" feature (Main Menu-> General Settings) to save your current settings, then use a text editor to customize the settings file as you wish.

Format Rules

- Format: setting: value
- Each setting must be on a separate line.
- Lines starting with # are ignored.

Settings (allowed values) [unit]

volume	(0 - 100)
bass	(-15 - 15)
treble	(-15 - 15)
balance	(-100 - 100)
channels	(stereo, stereo narrow, stereo wide, mono, mono left, mono right, karaoke)

shuffle (on, off)
 repeat (off, all, one)
 play selected (on, off)
 resume (off, ask, ask once, on)
 scan min step (1, 2, 3, 4, 5, 6, 8, 10, 15, 20, 25, 30, 45, 60) [seconds]
 scan accel (0 - 15) [double scan speed every X seconds]
 antiskip (0 - 7) [seconds]
 volume fade (on, off)

sort case (on, off)
 show files (all, supported, music, playlists)
 follow playlist (on, off)
 playlist viewer icons
 (on, off)
 playlist viewer track display
 (on, off)
 recursive directory insert
 (on, off)

scroll speed (1 - 10) [Hz]
 scroll delay (0 - 250) [1/10s]
 scroll step (1 - 112) [pixels]
 bidir limit (0 - 200) [% of screen width]
 contrast (0 - 63)
 backlight timeout (off, on, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 45, 60, 90)
 [seconds]
 backlight when plugged
 (on, off)

disk spindown (3 - 254) [seconds]
 battery capacity (1500 - 2400) [mAh]
 idle poweroff (off, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 30, 45, 60) [minutes]

lang (/path/filename.lng)
 wps (/path/filename.wps)

autocreate bookmarks (on, off)
autoload bookmarks (on, off)
us most-recent-bookmarks (on, off)

talk dir (off,number, spell, enter, hover)
talk file (off, number, spell)
talk menu (off, on)

Recorder-specific settings (allowed values) [unit]

loudness (0 - 17)
super bass (on, off)
auto volume (off, 2, 4, 8) [seconds]

MDB enable (on, off)
MDB strength (0 - 127) [dB]
MDB harmonics (0 - 100) [%]
MDB center frequency (20-300) [Hz]
MDB shape (50-300) [Hz]

peak meter release (1 - 126)
peak meter hold (off, 200ms, 300ms, 500ms, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 1min)
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)
peak meter busy (on, off)
peak meter dbfs (on, off) (on = dbfs, off = linear)
peak meter min (0 - 89) [dB] or (0 - 100) [%]
peak meter max (0 - 89) [dB] or (0 - 100) [%]

statusbar	(on, off)
scrollbar	(on, off)
volume display	(graphic, numeric)
battery display	(graphic, numeric)
time format	(12hour, 24hour)
font	(/path/filename.fnt)
invert	(on, off)
deep discharge	(on, off)
trickle charge	(on, off)
disk poweroff	(on, off)
rec quality	(0 - 7) (0=smallest size, 7=highest quality)
rec frequency	(48, 44, 32, 24, 22, 16) [kHz]
rec source	(mic, line, spdif)
rec channels	(mono, stereo)
rec mic gain	(0 to 15)
rec left gain	(0 to 15)
rec right gain	(0 to 15)
editable recordings	(on,off)
rec timesplit	(off, 0:05, 0:10, 0:20, 0:30, 1:00, 2:00, 4:00, 6:00, 8:00, 16:00 24:00) [hh:mm]
pre-recording time	(off, 1-30) [secs]
rec directory	(/recordings, current)

FM recorder specific settings

force fm mono (on,off)

Example File

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

4 DIFFERENCES BETWEEN BINARIES

You can get 3 different flavors of firmware binaries from Rockbox website. Current Version, Daily Builds and Bleeding Edge.

- The current version is the latest stable version developed by Rockbox Team. It's free of known critical bugs and works perfectly with Archos Jukebox Player/Studio and Recorders. Head on over to <http://rockbox.haxx.se/download/> and pull it down.
- Daily Build is a development version of Rockbox. It supports all new features and patches developed since last stable version. It may also contain bugs! This version is made automatically everyday and can be found at <http://rockbox.haxx.se/daily.shtml>
- Bleeding edge builds are the same as Daily build, but built from the latest development code every 20 minutes. These builds are for people who want to test the code that developers just checked in.

There are binaries for different Jukebox models:

- The Player version is suitable for Archos Jukebox 5000, 6000 and all Studio models.
- If you have a recorder with blue bumpers, you need the "regular" recorder version.
- FM Recorders are models with a FM radio.
- The V2 recorder is a recorder in an FM Recorder form factor, but without radio.
- The 8mb version requires a hardware hack, where the RAM chips are replaced.

Note: all references in this manual to "Recorder" apply equally to "FM Recorder" unless otherwise specified.

5 FIRMWARE LOADING

When your Jukebox powers on, it loads the Archos firmware in ROM, which automatically checks your Jukebox hard disk's root folder for a file named **archos.mod** (on the player version) or **ajbrec.ajz** (on the recorder version). Note that Archos firmware can only read the first ten characters of each file name in this process, so don't rename your old firmware files with names like archos.mod.old and so on, because it's possible that the Jukebox will load a file other than the one you intended.

6 GETTING EXTRAS: FONTS LANGUAGES

Rockbox supports custom fonts (for the Recorder version only) and a number of different languages. The latest stable version comes with 65 fonts and 22 languages already included. If new fonts and language files have been created, then they will be found at <http://rockbox.haxx.se/fonts/> and <http://rockbox.haxx.se/lang/>.

7 USING ROLO (ROCKBOX LOADER)

Rockbox is able to load and start another firmware file without rebooting. You just press PLAY on an .AJZ (Recorders) or .MOD (Players) file. This can be used to test new firmware versions without deleting your current version, or to load the original Archos firmware (you have to download the appropriate file from Archos' website).

8 ROCKBOX IN FLASH (RECORDER ONLY)

FLASHING ROCKBOX IS OPTIONAL! It is not required for using Rockbox on your Jukebox Recorder. Please read the whole section thoroughly before flashing your Jukebox!

8.1 INTRODUCTION

Flashing in the sense used here and elsewhere in regard to Rockbox means reprogramming the flash memory of the Jukebox unit. Flash memory (sometimes called "Flash ROM") is a type of nonvolatile memory that can be erased and reprogrammed in circuit. It is a variation of electrically erasable programmable read-only memory (EEPROM).

When you bought your Jukebox, it came with the Archos firmware flashed. Now, you can replace the built-in software with Rockbox.

Terminology used in the following:

Firmware means the flash ROM content as a whole.

Image means one operating software started from there.

By reprogramming the firmware, your Jukebox will boot much faster. The Archos boot loader seems to take forever when compared to the Rockbox version. In fact, the Rockbox boot loader is so fast that it has to wait for the disk spin-up. The flashing procedure is a bit involved for the first time, updates are very simple later on.

8.2 METHOD

The replaced firmware will host a bootloader and 2 images. This is possible by compression. The first is the "permanent" backup, not to be changed any more. The second is the default one to be started, the first is only used when you hold the F1 key during start. As it is supplied here, the first image is the original Archos firmware, the second is a current build of Rockbox. This second image is meant to be reprogrammed, it can contain anything you like, if you prefer, you can program the Archos firmware to there, too.

There are two programming tools supplied:

- The first one is called `firmware_flash.rock` and is used to program the whole flash with a new content. You can also use it to revert back to the original firmware you've hopefully backup-ed. In the ideal case, you'll need this tool only once. You can view this as "formatting" the flash with the desired image structure.
- The second one is called `rockbox_flash.rock` and is used to reprogram only the second image. It won't touch any other byte, should be safe to fool around with. If the programmed firmware is not operational, you can still use the F1 start with the Archos firmware and Rockbox booted from disk to try better.

8.3 RISKS

Well, is it dangerous? Yes, certainly, like programming a mainboard BIOS, CD/DVD drive firmware, mobile phone, etc. If the power fails, your 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. The new firmware file is completely read before it starts programming, there are a lot of sanity checks. If

any fail, it will not program. Before releasing this, we have checked the flow with the files supplied here, starting from the original firmware in flash. It worked reliably, there's no reason why such low level code should behave differently on your Jukebox.

There's one ultimate safety net to bring back boxes with even completely garbled flash content: the UART boot mod, which in turn requires the serial mod. It can bring the dead back to life, with that it's possible to reflash independently from the outside, even if the flash is completely erased. It has been used during development, else Rockbox in flash wouldn't have been possible. Extensive development effort went into the development of the UART boot mod. Mechanically adept users with good soldering skills can easily perform these mods. Others may feel uncomfortable using the first tool (`firmware_flash.rock`) for reflashing the firmware.

If you are starting with a known-good image, you are unlikely to experience problems. The flash tools have been stable for quite a while. Several users have used them extensively, even flashing while playing! Although it worked, it's not the recommended method.

The flashing software is very paranoid about making sure that the correct flash version is being installed. If the wrong file is used, it will simply refuse to flash the Jukebox.

About the safety of operation: Since we have dual boot, you're not giving up the Archos firmware. It's still there when you hold F1 during startup. So even if Rockbox from flash is not 100% stable for everyone, you can still use the box, reflash the second image with an updated Rockbox copy, etc.

The flash chip being used by Archos is specified for 100,000 cycles (in words: one hundred thousand), so you don't need to worry about that wearing out.

8.4 REQUIREMENTS

You need two things:

- The first is a Recorder or FM model. Be sure you're using the correct package, Recorder and FM are different! The technology works for the Player models, too. Players can also be flashed, but Rockbox does not run cold-started on those, yet.
- Second, you need an in-circuit programmable flash. Chances are about 85% that you have, but Archos also used an older flash chip which can't do the trick. You can find out via Rockbox debug menu, entry Hardware Info. If the flash info gives you question marks, you're out of luck. The only chance then is to solder in the right chip (SST39VF020), at best with the firmware already in. If the chip is blank, you'll need the UART boot mod as well.

8.5 FLASHING PROCEDURE

Here are step-by-step instructions on how to flash and update to a current daily build (with the voice feature). It may be helpful as well to sighted people because it more accurately tells you what to do than my previous documentation, and doesn't bother you with background knowledge. I assume you can install and operate Rockbox the usual way. The flashing procedure is not really dangerous, will check for correct model, file, etc., if something is incompatible it just won't flash, that's all.

Now here are the steps:

Preparation

Install (with all the files, not just the .ajz) and use the current daily build you'd like to have. Enable the voice features as helpful throughout the process, menus and filename spelling. Set the file view to show all files, with F1 -> General Settings -> File View -> Show Files set to "all". Have it nicely charged. We don't want to take the slim chances that you run out of power during the flash writing, right? Maybe keep it plugged to the charger.

Backup

Backup the existing flash content. You will need these files if you wish to reverse the flashing procedure, or if you need to update the bootloader (as opposed to the firmware) in the future. Keep them safe!

Select F1 -> Info -> Debug. No more voice menu from here on, but we just need to select the first entry, so press Play one more time. The disk should start to spin. Wait for it to settle down, then plug USB to harvest the dump file this has just created. The root directory of your box now should contain two strange .bin files. Copy the larger one named "internal_rom_2000000-203FFFF.bin" to a safe place, then you may delete them both from the box.

Copy the new flash content file to your box

Depending on your model (recorder, FM, V2 recorder), download one of the 3 packages:

http://joerg.hohensohn.bei.t-online.de/archos/flash/flash_rec.zip

http://joerg.hohensohn.bei.t-online.de/archos/flash/flash_fm.zip

http://joerg.hohensohn.bei.t-online.de/archos/flash/flash_v2.zip

The zip archives contain two .bin files each. Those firmware*.bin files are all we want, copy them to the root directory of your box. The names differ per model, the flash plugin will pick the right one, no way of doing this wrong.

Flash the full firmware image

Unplug USB again, then select F1 -> Browse Plugins. Use the filename spelling to locate "firmware_flash.rock", start it with Play. Wait for the disk to settle. It now displays an info screen, press F1 to acknowledge that and start a file check. Again wait for the disk to settle, then press F2 to get a warning label (if the plugin has exited, you don't have the proper file) and F3 to actually program the file. This takes maybe 15 seconds, wait for the disk to settle again. Then press a key to exit the plugin.

```
Flash: M=BF D=D6
SST39VF020
Size: 256 KB
using file:
/firmware_fm.bin
[F1] to check file
other key to exit
```

```
Flash size: 256 KB
Image at 80 KB
Checked:
File OK.
[F2] to program
other key to exit
```

```
Verify OK.
Any key to exit
```

Flashing the firmware in 3 easy steps

Future updates (optional)

From time to time, you may wish to update your firmware with a more recent version of Rockbox. All the above was necessary only once. This is how you will update the Rockbox version you're running from now.

Don't forget that you need your original Archos firmware images in the root directory in order to flash the Archos ROM into the flash memory. Make sure you keep a copy somewhere safe.

- Normally, you'll simply download or compile rockbox.ucl. Copy it together with ajbrec.ajz and all the rocks to the appropriate places, replacing the old.
- Unpack the whole build that you are installing onto the Jukebox, including plugins and support files.
- It is recommended that you test the build you are going to flash by playing the .ajz file so that ROLO loads it up. This puts the firmware in memory without changing your flash, so you can check that everything is working.
- Play the .ucl file, which is usually found in the **/.rockbox** directory, this will kick off the rockbox_flash.rock plugin. It's a bit similar to the other one, but it's made different to make the user aware. It will check the file, available size, etc. With F2 it's being programmed, no need for warning this time. If it goes wrong, you'll still have the permanent image.

```
checked:
File OK.

[F2] to program
other key to exit
```

```
Verify OK.

Any key to exit
```

- *Using rockbox_flash to update your boot firmware*

- It is possible that you will get an "Incompatible Version" error, if the plugin interface has changed since you last flashed Rockbox. You're running an "old" copy of Rockbox, but are trying to execute a newer plugin, the one you just downloaded. The easiest solution is to rolo into this new version, by playing the ajbrec.ajz file. Then you are consistent and can play rockbox.ucl.
- When done, you can restart the box and hopefully your new Rockbox image.

You can download UCLs for the latest Recorder and FM firmware from <http://joerg.hohensohn.bei.t-online.de/archos/flash>.

8.6 TECHNICAL DETAILS

The second image is the working copy, the rockbox_flash.rock plugin from this package reprograms it. The plugin needs to be consistent with the Rockbox plugin API version, otherwise it will detect mismatch and won't run.

It requires an unusual file format, a UCL-compressed image, because that's the internal format. UCL is a nice open-source compression library. The decompression is very fast and less than a page of C-code. The efficiency is even better than Zip with maximum compression, cooks it down to about 58% of the original size. For details on UCL, see: <http://www.oberhumer.com/opensource/ucl/>

Linux users will have to download the software from there and compile it, for Win32 and Cygwin the executables are in the packages at <http://joerg.hohensohn.bei.t-online.de/archos/flash>. The sample program from that download is called "uclpack". We'll use that to compress rockbox.bin which is the result of the compilation. This is a part of the build process meanwhile. If you compile Rockbox yourself, you should copy uclpack to a directory which is in the path, we recommend placing it in the same directory as the SH compiler.

If you start from a .AJZ file, you'll need to descramble it first into rockbox.bin, by using descramble ajbrec.ajz rockbox.bin. IMPORTANT: For an FM, the command is different, use descramble -fm ajbrec.ajz rockbox.bin! Otherwise the image won't be functional. Compress the image using uclpack, algorithm 2e (the most efficient, and the only one supported by the bootloader), with maximum compression, by typing uclpack --2e --best rockbox.bin rockbox.ucl. You can make a batch file for this and the above step, if you like.

8.7 KNOWN ISSUES AND LIMITATIONS

If the plugin API is changed, new builds may render the plugins incompatible. When updating, make sure you grab those too, and rolo into the new version before flashing it.















There are two variants of how the boxes starts, which is why there are normal and _norom firmware files. The vast majority of the Player/Recorder/FM all have the same boot ROM content, differentiation comes later by flash content. Rockbox identifies this boot ROM with a CRC value of 0x222F in the hardware info screen. Some recorders have the boot ROM disabled (it might be unprogrammed) and start directly from a flash mirror at address zero. They need the new _norom firmware, it has a slightly different bootloader. Without a boot ROM there is no UART boot safety net. To compensate for that as much as possible the MiniMon monitor is included, it starts with F3+ON. Using that the box can be reprogrammed via serial if the first ~2000 bytes of the flash are OK.

APPENDICES

1 FEATURE COMPARISON CHART

FEATURE	ROCKBOX	ARCHOS
ID3v1 and ID3v2 support	Yes	?
Background noise during playback	No	Yes
Mid-track resume	Yes	No
Mid-playlist resume	Yes	No
Resumed playlist order	Yes	No
Battery lifetime	Longer	Long
Battery time indicator	Yes	No
Customizable font (Recorder)	Yes	No
Customizable screen info when playing songs	Yes	No
USB attach/detach without reboot	Yes	No
Can load another firmware without rebooting	Yes	No
Playlist load speed, songs/sec	3000 - 4000	15 - 20
Max number of songs in a playlist	20 000 (default)	999
Supports bad path prefixes in playlists	Yes	Yes
Open source/development process	Yes	No
Corrects reported bugs	Yes	No
Automatic Volume Control (Recorder)	Yes	No
Pitch control (Recorder)	Yes	No
Text File Reader	Yes	Yes
Games (Recorder)	8	No
File Delete & Rename	Yes	Yes
Playlist Building	Yes	Yes
Recording (Recorder)	Yes	Yes
Generates XING VBR header when recording	Yes	No
High Resolution Volume Control	Yes	No
Deep discharge option (Recorder)	Yes	No
Customizable backlight timeout	Yes	Yes
Backlight-on when charging option	Yes	No
Queue function	Yes	Yes
Supports the XING header	Yes	Yes
Supports the VBRI header	Partly	Yes
Max number of files in a dir	10000 (default)	999
Adjustable scroll speed	Yes	No
Screensaver style demos (Recorder)	Yes	No
Variable step / accelerating ffw and rwd	Yes	No
Visual Progress Bar	Yes	No
Select/Load configs	Yes	No
Sleep timer	Yes	No
Easy User Interface	Yes	No
Remote Control Controllable	Yes	Yes
ISO8859-1 font support (Player)	Yes	No
Queue songs to play next	Yes	Yes
Bookmark positions in songs	Yes	No
Number of available languages	22	3
Accurate VBR bitrate display	Yes	No
FM Tuner support (FM Recorder)	Yes	Yes
FF/FR with sound	No	Yes

2 SUPPORTED FILE FORMATS

	FILE TYPE	ACTION
	Directory	The browser enters that directory
	.mp3	Rockbox takes you to the WPS and starts playing the file
	.m3u	Rockbox loads the playlist and starts playing the first file
	.ajz/ .mod	ROLO will load the new firmware
	.wps	The new WPS display configuration will be loaded
	.lng	That language will replace current one
	.txt	This will display the text file using Rockbox text browser plugin
	.cfg	The settings file will be loaded
	.fnt	This font will replace the current one (Recorder only)
	.rock	Starts a Rockbox plugin
	.ucl	This Rockbox image will be flashed into the ROM
	.ch8	Play a Chip8 game
	.jpg/.jpeg	View a JPEG image
	.rvf	View a movie (Rockbox format)

3 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 requests (see below).

For open bug reports refer to <http://rockbox.haxx.se/bugs.shtml>

Rules for submitting new bug reports:

1. Check that the bug hasn't already been reported
2. Always include the following information in your bug report:
 - Which exact model Jukebox you have (as printed on the unit)
 - Which exact ROM firmware version you have
 - Which exact Rockbox version you are using (Menu->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!)
3. If you have a Sourceforge account, log in before you file the report.
4. If you don't have a SF account, sign the report with your email.

4 FEATURE REQUESTS

For open feature requests refer to <http://rockbox.haxx.se/requests.shtml>

Rules for submitting a new feature request:

1. Check that the feature hasn't already been requested. Duplicates are really boring!
2. Check that the feature hasn't already been implemented. Download the latest daily build and/or search the mail list archive.
3. Check that the feature is possible to implement (see page 79).
4. You must be logged in with your Sourceforge account to submit a request. If you don't have an account, get one.

5 WHAT'S NEW SINCE 2.0?

Changes in version 2.3

- Voice user interface
- Improved support for MDB (recorder)
- FM radio enhancements
- New plugins: clock, battery_test
- JPEG / RVF support
- Bugfixes

Changes in version 2.2

- Bookmarking functions added
- Improved playlist support
- WPS enhancements
- New plugins: greyscale, mandelbrot, metronome
- Recording enhancements (recorder)
- Bugfixes

General changes since 2.0

- Loadable plugins
- Dynamic playlist creation and manipulation
- Configurable max directory size (default: 400 files)
- Configurable max playlist size (default: 10000 files)
- Remote control now works while keys are locked
- Car mode: Pauses and resumes playback with charger power loss and restore
- Caption backlight: Briefly turns on backlight during track change
- Battery meter is more accurate during the first minutes after boot
- Automatically detects modified archos.mod/ ajbrec.ajz after exiting USB mode and asks if you want to run it
- Files and configurations in /.rockbox are now accessible from Menu
- Stopped playlists can be resumed from File Browser by pressing ON
- Never turns off/reboots while charger is connected
- .wps files now support comments
- Improved ID3v2 support
- Option of hiding icons in File Browser

Player-specific changes since 2.0

- Games: Jackpot and NIM
- Jump scroll: Scrolls the entire screen width each step
- The Line In port is enabled

Recorder-specific changes since 2.0

- Rockbox can now be stored in flash ROM, giving much quicker bootup
- Support for V2 recorders
- Radio support (FM Recorder only)
- Default contrast is now auto-detected, preventing unreadable display
- Option of using an inverted bar instead of cursor in File Browser and Menu
- Frame-accurate recording file splits set manually or preset by time
- Improved Xing header generation in recorded files
- New games: FlipIt, Snake, Star, Sliding Puzzle and Chip8 emulator
- A calendar application plugin

6 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.
- 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 Jukebox 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 ways of actually controlling the communication performed over USB since the USB circuit in the Jukebox 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 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 12MHz 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 venture into this.
Others may do so. We do not.
- Multi-band (or graphic) equalizer!
We cannot access information for that kind of visualization from the MP3 decoding hardware.
- Support other filesystems than FAT32 (like NTFS or ext2 or whatever)!
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 adding support for more file systems will just take away valuable ram for unnecessary features.
You can partition your Jukebox fine, just make sure the first one is FAT32 and then make the other ones whatever file system you want. Just don't 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.

- CBR recording!

The MP3 encoding hardware does not allow this.

- Change tempo of a song without changing pitch!

The MP3 decoding hardware does now allow this.

- Graphic frequency (spectrum) analyzer!

We can't access the audio waveform from the MP3 decoder so we can't analyze 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 can't do that. The MAS chip is programmable, but we have no access to the chip documentation.

7 CREDITS

People that have contributed to the project, one way or another. Friends!

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