

# **Cathedral**

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**REVISION HISTORY**

NUMBER	DATE	DESCRIPTION	NAME

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## Chapter 1

# Cathedral

### 1.1 Cathedral by Deniil 715!

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Cathedral v1.31 by Deniil 715!  
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Made in 2002-10-09

```
Introduction  
Installation  
Requirements  
News & Changes  
Bugs  
Usage  
Author  
OnyxSoft
```

### 1.2 Introduction..

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Intro  
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This program is made to create fat reverb effects on audio samples.  
It can process 16-bit AIFF stereo or mono files or 16-bit RAW stereo  
samples.

DISCLAIMER: This is an experiment! I take no responsibility what so

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ever for anything this program might do to you, your system or data. Use it at your own risk.

The program is based on the theory that in a cathedral (or church or any big (non-square) room) a sound that is emitted somewhere will be reflected by the walls, carrying pillars and other stone monuments usually found in these kinds of buildings, with different delay for each echo. These different delay times for each echo would seem close to random if listed in a table, but they are not in a real building, ofcourse. Also the volume of the different echos are different depending on how far away each wall is and how soft it is.

My program then creates a list of echoes with different delay times which are randomly generated within the limits you specify. Each echo also has a randomly generated volume, also within your specified limits.

This is then applied onto a sample and the result can be quite remarkable! Try the default settings, they should give a nice first impression :-)

There is an example included in the archive called "Say - Cathedral\_st.mp3". It demonstrates how a sample of the Say voice can sound after a treatment by Cathedral :-)

To make this example we used:

Speak-2-Sample

- to convert the Say voice to a sample.

8SVXtoXXX (OnyxSoft product)

- to convert the sample from IFF-8SVX to AIFF.

TheMPegEncGUI (OnyxSoft product)

- To be able to use:

Lame

- for encoding the sample to MP3. And..

Cathedral (OnyxSoft product)

- to apply the reverb effect.

## 1.3 Installation..

Installation

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Cathedral needs no particular installation, just copy the main program "Cathedral", the drawer "Engines" and at least one engine that you plan on using.

Preferably you should copy the whole drawer with this guide and all engines in the engines drawer so that you can choose later. This guide is available with the Help-key on the keyboard if it is in the same drawer as Cathedral.

The main program is compiled for 68000 CPU.

The engines are available for:

68020 without FPU

68040 with FPU

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PPC - PowerUP  
PPC - WarpOS  
PPC - MorphOS (no available yet)

If you have a PPC I suggest you use it! I did some testings on my 68LC040/25MHz vs. 603e/160MHz. The PPC was about 35 times faster than the LC040 with fpu-emulation!

## 1.4 Requirements..

Requirements  
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OS version 37+

MUI v3+

Asl.library v37+

Preferably an PPC, or atleast a fast 68k CPU with FPU but a slow 68020+ without FPU is alright too, but processing could take hours.

## 1.5 Usage..

Usage  
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Start the program, it has a MUI-GUI.

Status

Here you will constantly see what's happening and most error-messages will show here as well. This is also the progress bar.

Project

On this page you select files and their data.

Info

Here you will see data about the current source file.

Source File

This is the 16-bit AIFF file that you want to put reverb on.

Target File

This is the output file which will be the reverbed source file. It must not be the same as the source file.

Choose

Choose the frequency of the input file that you want the echo generator to base its calculations on. The file will not be

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resampled even if you choose a different frequency than the one of the source file. If you're using AIFF-samples you should set this to "From file" and if you use RAW you must set it to something else.

#### Custom

If you chose Custom in the cycle gadget you can enter your custom frequency here.

#### Echo generator

On this page you construct the actual characteristics of the reverb you want to make. After any change on this page you must press Generate to make use of them.

#### Number of echos

This is how many echoes you want. The more echoes, the more complex building is simulated.

Note: This setting is the most time-dependent one. If you double the number of echoes you double the time the processing will take.

#### Average echo length

This is the average time between every echo reflection. You could say that the longer time here, the larger building is simulated. Calculate 36cm for 1ms.

Note: This value multiplied with the number of echoes make up the buffer size, so a high value here and many echoes would need a buffer of a few megabytes. Also file frequency is included in this calculation.

#### Random echo length

This is how much the time between every echo should differ from one echo to another. The lower value here, the more tube-like echo you will get.

Note: Even if you set this to a very high value and have f.ex 10 echoes with average 10ms between them, the last echo will no matter what still be around 100ms delayed.

#### Nearest echo wall

Here you can set a value in meters for how close the nearest wall is in the simulated building. Nice to use when simulating very large arenas or being outside or something.

It generally gives a more open sound to have at least a few meters distance.

#### Echo volume

Here you can set how loud every echo should be in average. Generally you should use a lower value here if you increasing the number of echoes.

#### Echo volume varying

Here you can set how different the echoes should be in volume. Setting this to -70.0dB will cause all echoes to have virtually the same volume.

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#### Intensity of 1st echo

This represents the percentage of the volume for the first echo.

#### Intensity of last echo

This represents the percentage of the volume for the last echo. All echoes between get and interpolated volume between the volume for the first and the last echo.

#### Echo response L<->R

This is in what (stereo-)channel the generated echoes from each channel should be put. This setting really only makes sense if you use a stereo input file.

Separate means that the echoes generated from the left channel should give their echo in the left channel and echoes from the right channel should give their echo in the right channel.

Strict alternating means that every other echo generated from the left channel should be put in the right channel and the rest in the left channel. And every other echo generated from the right channel should be put in the left channel and the rest in the right channel.

Random alternating means that around half of the echoes generated from the left channel is put in the left channel and the rest in the right channel and vice versa for the right channel.

These two alternating methods give best result if you use a stereo-sample with very distinct left and right channels, like f.ex a ProTracker module.

Swapped L->R & R->L means that all echoes generated from the left channel is put in the right channel and every echo generated from the right channel is put in the left channel.

#### Make stereo output for mono input

This is a very nice feature that makes a plain mono sample into a very wide (depending on your settings) stereo sample as the generated echolist for each channel is different and thus it doesn't matter if the source is mono.

#### Process settings

##### Stereo separation

This slider is an complement to the Echo response L<->R on the echo generator page. If you set Echo response to Separate then you can use this slider to set a percentual value between Separate and Swapped. And whatever you set Echo response to you can always use this slider to make the reverb to come more or less from the middle instead of from any specific channel.

##### Mix with original

Here you can set, in percent, how much of the original sound you want in the resulting sample. If you set this to 0 only the reverb will be heard in the resulting sample, and believe me, that sounds strange :)

Good value is just a bit below 100% to eliminate distortion. But if you have a very silent source file you can set this to more than 100% to boost the sample at the same time as you put reverb on it.

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### Echo sustain

If you don't use any sustain the reverb will only consist of the number of echoes you specify on the echo generator page and that's that. Normally, however, the echoes themselves give an echo and with the sustain setting you can simulate just that. Here you can set how loud the re-echoes should be by percent. If you use a value too high it will just result in a metallic noise. This is because the volume of each re-echo is the same (the percent of this sustain). But if you use a low or no sustain the reverb can sound stiff or poor, depending you the other settings.

Note: Using sustain gives a slightly slower processing and it also adds a 5Hz high-pass filter to keep zero from drifting away. So if you want to process a sound with extremely low frequencies you might want to disable the Echo sustain routine by setting it to 0.

### Lowpass filter

High frequencies usually doesn't echo as much as lower frequencies. Here you can set how high frequencies you want to be echoed. It's a very soft filter so don't be afraid to use it. Frequencies above the filter frequency doesn't get completely cut, just made gradually weaker.

### Use 100% stereo separation

This switch disables the Stereo separation routine and thus makes the processing go faster. It has the same effect as if you set the Stereo separation slider to 0, but with the difference that it now goes faster.

### Let echo fade out at end of file

The echoes from the last milliseconds of a file typically get beyond the end of the source file. With this switch you can make echo generator to write the last buffer too, which contains the echo from the last milliseconds.

## Preferences

### Get echo generator settings from echolist

With this switch on the settings on the echo generator page will be updated with the settings used when you created the echolist file whenever you read it. The "now" button can be use to read the settings from the echolist file now. Useful if you have this swicth off.

If you never save any echolist you don't have to care about this.

### Write info file for the processed file

Whenever you process a file another file called <targetname>.data will be written too, if this switch is on. This textfile contains some readable data about how the file was process so that you know what settings you used when you created this particular sample.

### Auto Generate echolist whenever necessary

If you have generated a echolist and then changes the source file to a file with different frequency, not same mono/stereo or you change the mono/stereo output for mono files you must generate a new echolist. With this switch on it will be done automatically. The Status filed at the top of the window will

tell you whenever it has created a new echolist, or if you need to do it manually.

Note: Changes on the echo generator page will not trigger a regeneration of the echolist.

Do not warn when overwriting output file

When you press Process or Test the target file will be written too. If it already exists you will get a warning. This switch disables this warning.

Auto set output file when picking input file

This will automatically select a target name whenever you pick a new source file. The target file name will be the source name + "\_st" if the target file is to be in stereo and "\_mo" if it will be a mono file.

CPU-type for the echo-engine

Here you can select which CPU you want to use.

If you don't have a PowerPC and no 68k-FPU you should use the 68020 No-FPU version.

If you have no PowerPC but you do have a 68k-FPU you should use the 68040 FPU version. This should work with 6888x too.

If you do have a PowerPC I suggest you use any of the PPC-engines, whichever suits your system best.

Play button plays

Here you can set what file the %f switch in the player string should stand for; Source or Target. This will affect which sample is usually played when you hit the Play button.

EchoList

If you usually process the same type of files, and you managed to create an echolist you think give a very good result you can enter a file here and save the echolist into this file instead of regenerate a new list every time which might not be as good as the one you generated once.

The list here will be automatically loaded when you start the program.

Player

Here you can enter a player if you want to use the Play button. %f is the filename to play. The cycle gadget "Play button plays" decides if %f is the source or target filename.

You can also use %s to always use the source file or %t to always use the target file. %s and %t are good if you want to use both source and target at the same time for some reason. Normally you would however use %f and the cycle gadget for the filename to play.

Process

Press this button when you have made all adjustments in the program and want to process your file.

Test

This will generate a test file of just one single sinus curve and the process it and write the processed test file to the target file. This is a way to test a setting in the program. It could be nice

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to watch this test file in a sample editor too to see how the program works.

#### Generate

This button will take all settings on the echo generator page, the source file frequency and number of channels (mono/stereo) and generate an echolist. You must do this before you can do any processing.

#### Play

This will open a console and execute the command line entered in the Player field on the preferences page. In other words it will play the target file with Play16 unless you have changed this commandline.

#### Stop

This will stop the processing. (It will not stop playing, you'll need Ctrl-C or something for that.)

Note: It will set a stop flag which the engine will read when it changes to a new buffer, therefore it could take a little while before it responds, especially if you use a slow CPU.

#### Quit

This will exit the program and save the prefs.

#### The Project menu

##### Write info file

With this you can write an info file containing the echolist and some other settings to a text file called <target name>.data. Here you can see the echo list table. There is also a switch on the preferences page to write this automatically when you process a file.

##### Save settings

This will save all settings in the GUI. This will however also be done when you quit the program.

##### MUI settings...

This will open the standard MUI settings for Cathedral.

##### About

Show some info about the program.

##### OnyxSoft

Show some info about OnyxSoft.

##### Quit

This will exit the program and save the prefs.

#### The Project menu

##### Load new echolist...

If you have a bunch of echolist files saved and you want to use a new one you can load it here.

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#### Load echolist

This will reload the echolist from the location entered in the EchoList field on the preferences page.

#### Save new echolist...

This will open a filerequester asking you for a new place to save an echolist.

#### Save echolist

This will save the current echolist in memory to the file in the EchoList field on the preferences page.

#### Export text echolist...

This will export an echolist as a textfile that you may edit by hand and then maybe later import back into the program. If you export an echolist without having one currently in memory you can choose to save a template echolist.

#### Import text echolist...

This will let you import a text echolist that you have made yourself into the program. Export an echolist to see how it looks.

#### Display window

##### Display echolist

This will open a window and draw the echolist as a graph with a vertical line for every echo in the list. The height of every line is the volume for every specific echo. The title of the window contains info about the current scaling of the window.

##### Zoomed display

If you enable this switch the window will zoom in to show only as much as necessary to be able to show the highest possible echo peak.

##### Draw lines between the peaks

With this enabled lines will be drawn between the top of every echo peak. This can sometimes give a wierd 3D-look. This is beacuse sometimes when you use a high Random echo length a peak that is supposed to be after another actually ends up before it instead.

##### Show avarage and varying volume

If you have ever wondered about the relationship between Echo volume and Echo volume varying this might give you the answer in a graphical way. The white line (pen #2) shows the Echo volume that you have set with the silder and the two blue lines (pen #3) shows the lower and upper limit where the volume of the echo peaks may vary between.

## 1.6 News..

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## News and Changes

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- \* NEW \* If a file seems to be raw it is assumed to be stereo now instead of mono as most 16-bit raw files, like CDDA are stereo.
- \* NEW \* Added a gauge in the Status-field to show progress more clearly.
- \* NEW \* Changed the default settings a bit.
- \* NEW \* Added hotkeys for most menu-operations.
- \* NEW \* Removed most Seek()-operations which might make it easier to use PIPE: as input.
- \* NOTE \* There are no changes in the engines compared to v1.3.

## v1.3

- \* Added a lowpass filter. This will make the reverb sound more real. You can also use more reverb without drowning in it.

## v1.2

- \* Added a start and end percentage volume for the echolist generator so that it will be possible to make f.ex. the echoes that is most far away to have a lower volume in average.
- \* Added a window in which you can see the echolist and all the echo peaks graphically. See the Echolist menu.
- \* Now it is possible to design your own echolist manually as a textfile. This is nice if you want to simulate something specific and not a random building or something. You can also export an echolist as text so that you can look at it in detail and change it to perfection if you want.

## v1.1

- \* This was the first public release!

## 1.7 Bugs..

## Bugs

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If you set Echo sustain too high you might get a tone in the background that seems to grow. This is because the sustain uses a loopback and in certain circumstances this can produce a tone. Try setting a lower sustain in this case.

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## 1.8 Author..

Author  
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Daniel Westerberg: [deniil@algonet.se](mailto:deniil@algonet.se)  
My homepage: <http://www.algonet.se/~deniil/>

## 1.9 OnyxSoft..

OnyxSoft support  
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If you like our products, found bugs, have complains or ideas etc. etc. Don't hesitate to contact us..

OnyxSoft productions can be found on our HomePage.  
Updates and new releases will be there first.. (hopefully ;))

My OnyxSoft e-mail: [daniel@onyxsoft.nu](mailto:daniel@onyxsoft.nu)  
OnyxSoft HomePage : [www.onyxsoft.nu](http://www.onyxsoft.nu)

We just love to get response from other Amigans!!

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