# AudioPaint

Introduction to AudioPaint



Reference



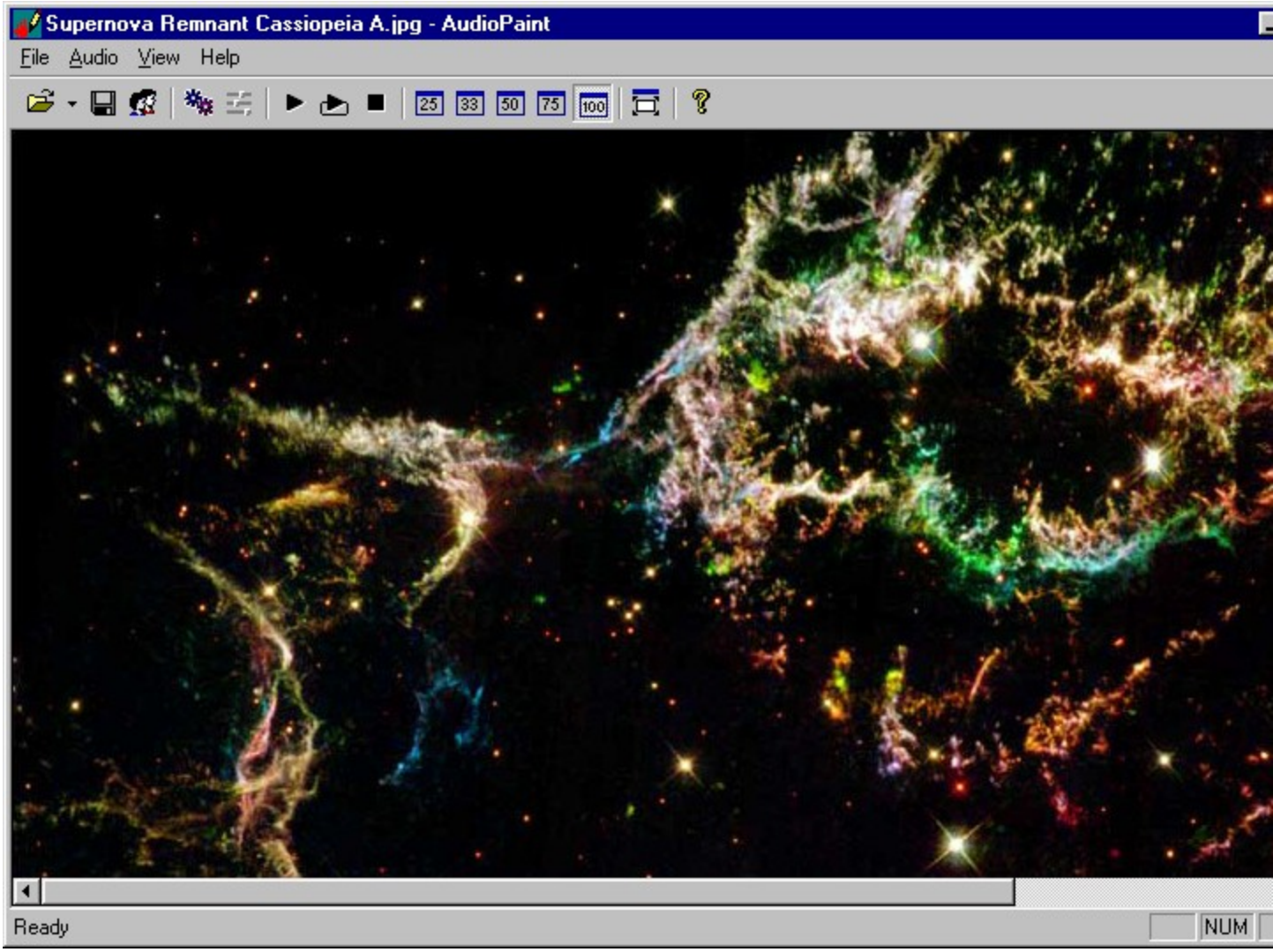
Support



This is a short documentation for AudioPaint 1.3. Make sure this is the latest version at www.nicolasfournel.com\audiopaint.htm
Please note that this program has been initially written for my personnal use. Therefore, there is no warranty of any kind. Use it at your own risk !

# What is AudioPaint ?

AudioPaint generates sounds from pictures.
The program can read JPEG, GIF and BMP files and translates each pixel position and color into frequency, amplitude and pan information.
AudioPaint can therefore be considered as a massive additive synthesis tool.



# How does it work ?

The picture corresponds to a big frequency / time grid.
Each pixel of the picture is analyzed and drives an oscillator.
The vertical position of the pixel determines its frequency, while its horizontal position corresponds to time.
The color of the pixel is used to determine its pan.
By default, the red component controls the amplitude of the left channel, while the green component corresponds to the right channel (the brighter the colour, the louder the sound), and the blue component is not used. The action of each component can be modified in the Routing section of the Parameters window.

# Program History

**version 1.3 - 12/28/2002**
- samples can be previewed in the file requester (Parameters window)
- stereo samples are now accepted for waveforms
- fixed a bug when user tried to read an invalid picture file

**version 1.2 - 11/22/2002**
- the max duration of the sound generated has been extended
- fixed a bug with very short sample files
- a more convenient documentation (this help file)

**version 1.1 - 11/17/2002**
- project files (store the picture name + audio parameters)
-"play loop" and "stop" commands / buttons
- routing of red/green/blue component to left / right channel
- use of samples as waveforms for the synthesis
- new user's preferences window:
    - default folders
    - playback mode
    - normalization

**version 1.0 - 11/03/2002**
- another program done in a single week-end :-)

# The Menu & Toolbar functions

### File Menu

- Open Project...(Ctrl+O) : open an AudioPaint project (.apt) including the path to the picture and the audio parameters
- Save Project (Ctrl+S) : save the current AudioPaint project (.apt)
- Save Project As... : save the current AudioPaint project (.apt) under a given name
- Import Picture... (Ctrl+I) : open a picture file (JPEG, BMP or GIF)
- Export Sound As... (Ctrl+E) : save the generated sound as a wave file (always 44.1 kHz, 16-bit, stereo)
- Preferences... (Ctrl+P) : display the user's preference window (see below).
- Exit : quit the program

Note: you will notice that the recent files list contains the names of the last pictures imported, rather than the list of the last projects loaded.
After using the program for a while, it became apparent it was more useful like that, because you will find yourself opening the pictures more often than the projects.
But it can be a bit confusing at the beginning.

### Audio Menu

- Generate (F2) : generate a sound from the loaded picture given the synthesis parameters defined by the user.

For long durations, this can be quite long. A progress bar is displayed at the bottom of the application window, in the status bar.

- Play (F3) : play the last generated sound.
- Play in loop (F4): play the last generated sample in loop
- Stop (F5) : stop the sample being played
- Parameters (F6) : display the window that sets the synthesis parameters (see below).

### View Menu

- 25%...100% of original size: display the picture at xx% of its original size.

This is only to help the user to visualize a large picture.
This does not affect the resulting sound.

- To Fit : stretch the picture to fit in the window. As above, it does not affect the sound generated.
- Toolbar : show or hide the toolbar
- Status Bar : show or hide the status bar.

### Help Menu

- About AudioPaint... : display program information, version number and copyright.
- Web Site... : connect to the AudioPaint web site.

# The Parameters window

Here are the parameters available in this window:

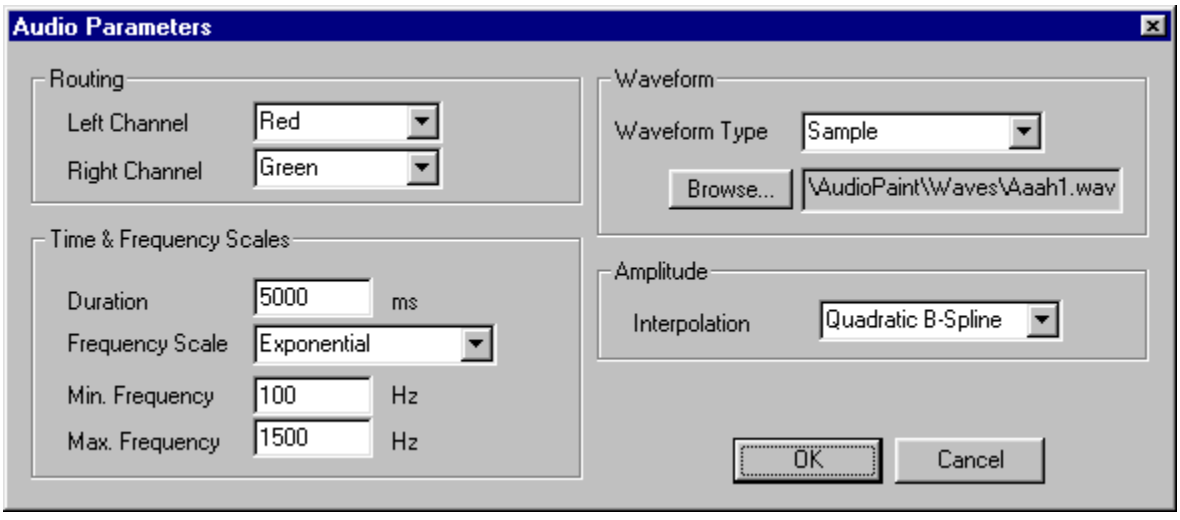
**Routing**
- Left channel: selects what color component will be used to generate the left signal (red, green, blue or none)
- Right channel: selects what color component will be used to generate the right signal (red, green, blue or none)

**Frequency and time scales**
- Duration: the total duration of the sound to be generated.
- Frequency scale: the scale (linear or exponential) used to determine the frequencies of the pixels.
- Min frequency: the frequency of a pixel at the bottom of the picture.
- Max frequency: the frequency of a pixel at the top of the picture.

**Waveform**
- Waveform type: selects the type of waveform to be used (sine wave or sample file)
- Browse: if the waveform is a sample file, you can select it by pressing this button.

Note: when you select a sample as the waveform, nothing is done to prevent aliasing at the highest frequencies.

**Amplitude**
Interpolation: the type of interpolation (none, linear or quadratic) used to go from the amplitude of a pixel to the amplitude of its neighbour.
By default, the interpolation is set to none. If you hear noise in the sound generated, switch to linear, or even better, quadratic interpolation.

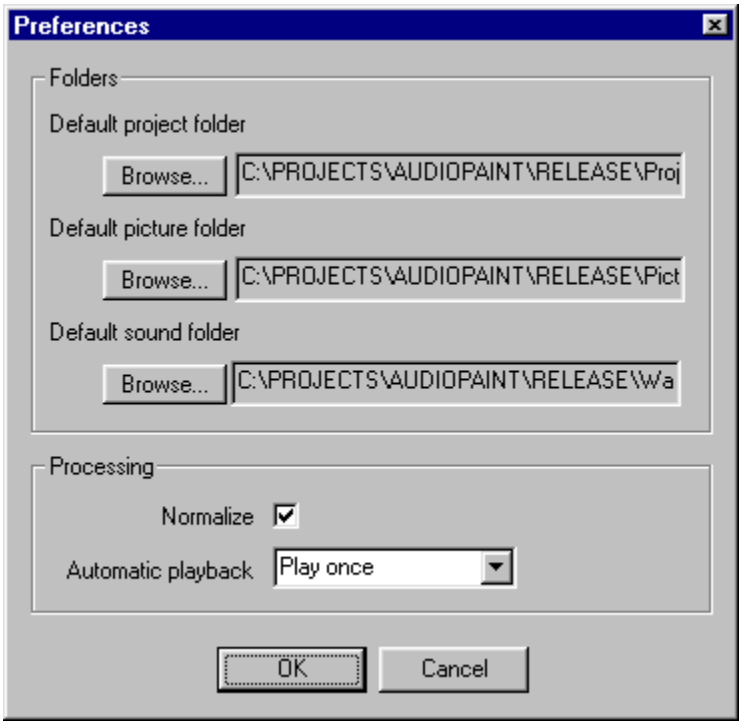


# The Preferences window

The Preferences window lets you select the default folders for project, pictures and sounds.
These folders are used when you want to load / save a file for the first time.
Then, the last folder where you loaded / saved something will be used instead.

This window also lets you select the post-processing options:
- The playback mode determines how the sound generated will be played after the processing (no playback, played once, or played in loop).
- The normalize box should usually be checked. It ensures that the sound will have a suffcient amplitude, but will not be clipping.

Your parameters in the preferences window are saved in the registry and will be recalled next time you launch AudioPaint.



# How to use AudioPaint ?

Depending of the picture, several hundreds (even thousands) of oscillators can be generated simultaneously.
Due to the large amount of data to process, AudioPaint is not real-time.
Once you chose your picture and the parameters, you generate a sound. Then you can save it as a .WAV file for further processing in a sound editor such as Sound Forge / Wavelab etc.... or to import it as an audio track in a sequencer (Sonar, Acid etc...).

The sounds generated vary greatly depending on the type of pictures used.
I tested AudioPaint with picture taken by the Hubble Space Telescope and available at the Hubble Heritage Gallery of Images (http://heritage.stsci.edu/gallery/galindex.html). The results are complex and fascinating futuristic soundscapes, especially with long durations.
Maps are also a good starting point for your sonic exploration, as well as paintings of Picasso, Monet and other great artists. And of course, don't hesitate to create pictures specially for AudioPaint,in PhotoShop or a similar graphic package.
By playing with geometrical shapes and colors, you can create very interesting sounds.

# Known issues

No known issues at this time.

# What is next ?

The current version is 1.3. The following features could find their way into the next version(s):

- a component (blue by default) could be used to control an effect such as a waveshaper
- new predefined frequency scales
- integrated delay / reverb effects
- new interpolation modes for the wavetables
- new synthetic waveforms (saw, pulse...)
- a "Picture" menu including some graphic manipulation functions