

The Velocity Sound Engine is a software device that spatialises sound in the horizontal two-dimensional plane about the listener's head. Through the use of a mouse the sound source point can be placed anywhere in the plane and the software will modify an incoming sound stream so that it appears to emanate from the selected location.

## Installation:

### Requirements

- Microsoft Windows 98, 2000, NT 4.0 Operating System;
- 600 MHz Intel 0x86 architecture base processor, minimum;
- 8-bit stereo sound card;
- Enclosed Headphone set.

### Procedure

The Velocity Sound Engine software is distributed in zip file format (2DSnd\_inst.zip). On receiving the 2DSnd\_inst.zip file, please, use a decompression tool such as WinZip to unpack the contents of the file to a temporary directory. Once the contents of the file are decompressed use either the Windows Explorer or the run dialogue to execute the Setup.exe file in the temporary directory. The installation package was created using InstallShield. On execution of Setup.exe InstallShield will present the steps that will install the Sound engine on the system.

The installation will place the following files in the installation directory that was chosen.

#### Executable

Gen3d.exe

#### Support Files

BorIndmm.dll

Vcl40.bpl

Vclx40.bpl

Vcljpg40.bpl

Cp3245mt.dll

#### Sample Sound Files

Jet\_idle\_01.wav

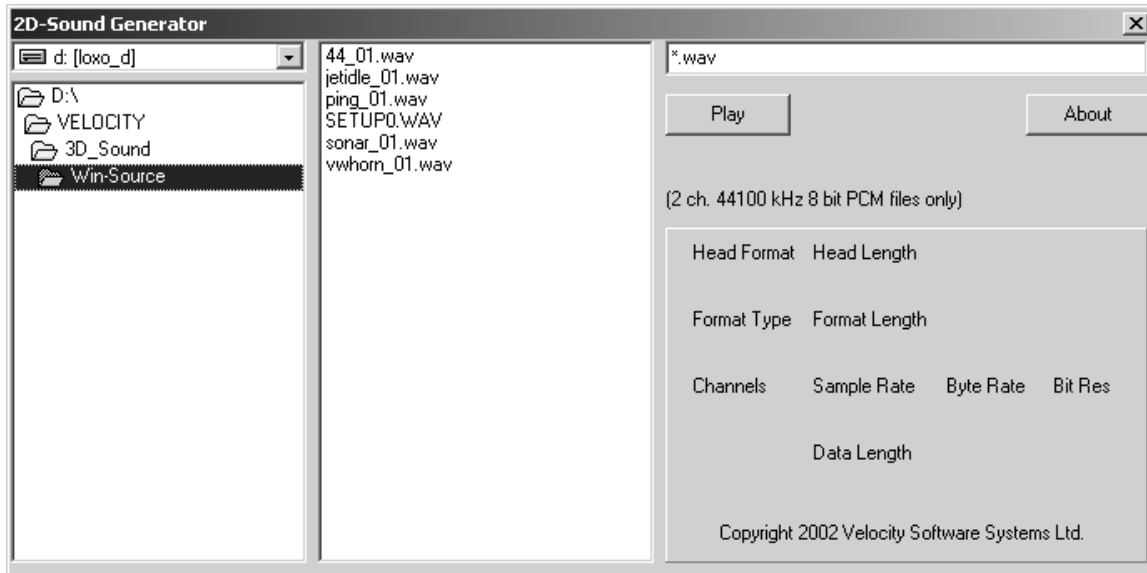
44\_01.wav

ping\_01.wav

vwhorn\_01.dll

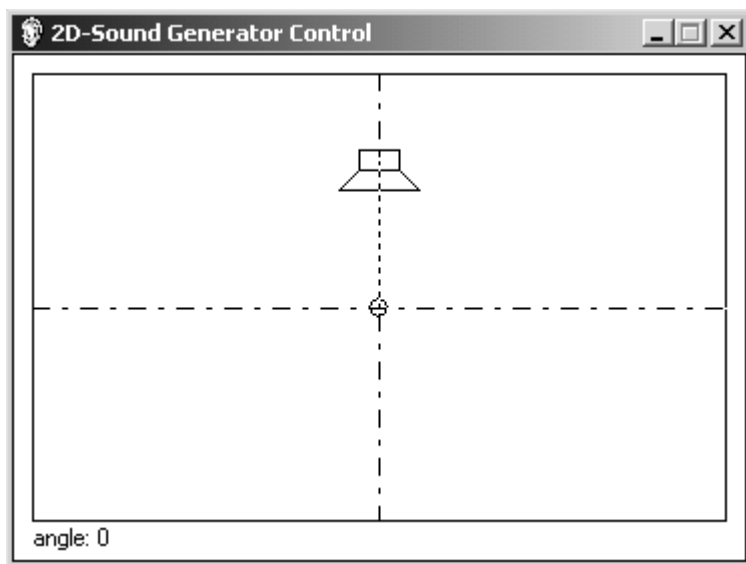
### Running

Once installed the program Gen3d.exe is accessible through Windows explorer, the run dialogue or the Start program menu. The following window opens,

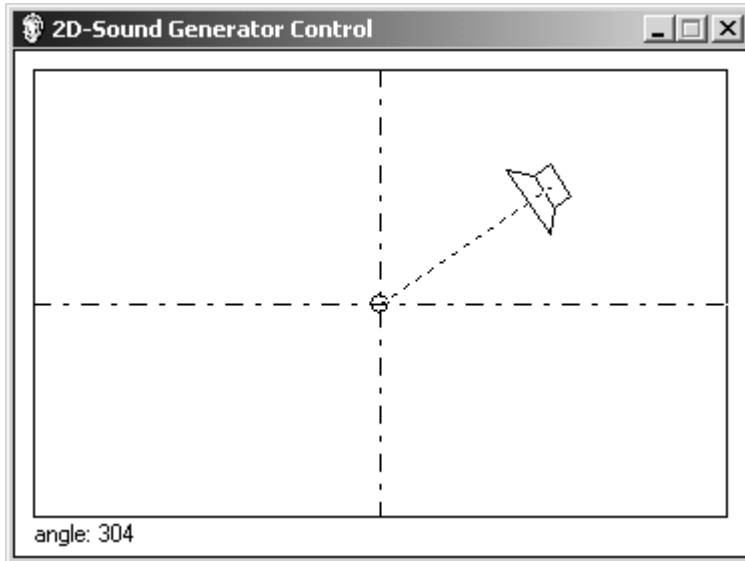


This window allows the user to select a wav file to play. When a file is selected the wav header of the File is read to determine if the recording parameters used to store the file match the criteria required for the 2d-Sound Generator application, namely ( 2 channel, 44.1kHz 8-bit PCM encoding). The relevant header information for all files is displayed in the panel in the lower right-hand corner of the window.

Once the file has been selected and it has the correct encoding format the Play button will begin playing the file. The following dialogue window will be presented to the user, if an appropriate sound device is found.



By hovering the mouse cursor over the icon of a speaker the speaker location can be moved within the window e.g.



The sound generated will be commensurately modified to mimic the virtual change in location. The particular wav file being played will play continuously until the Control window is closed, in which case the main window will become active again.

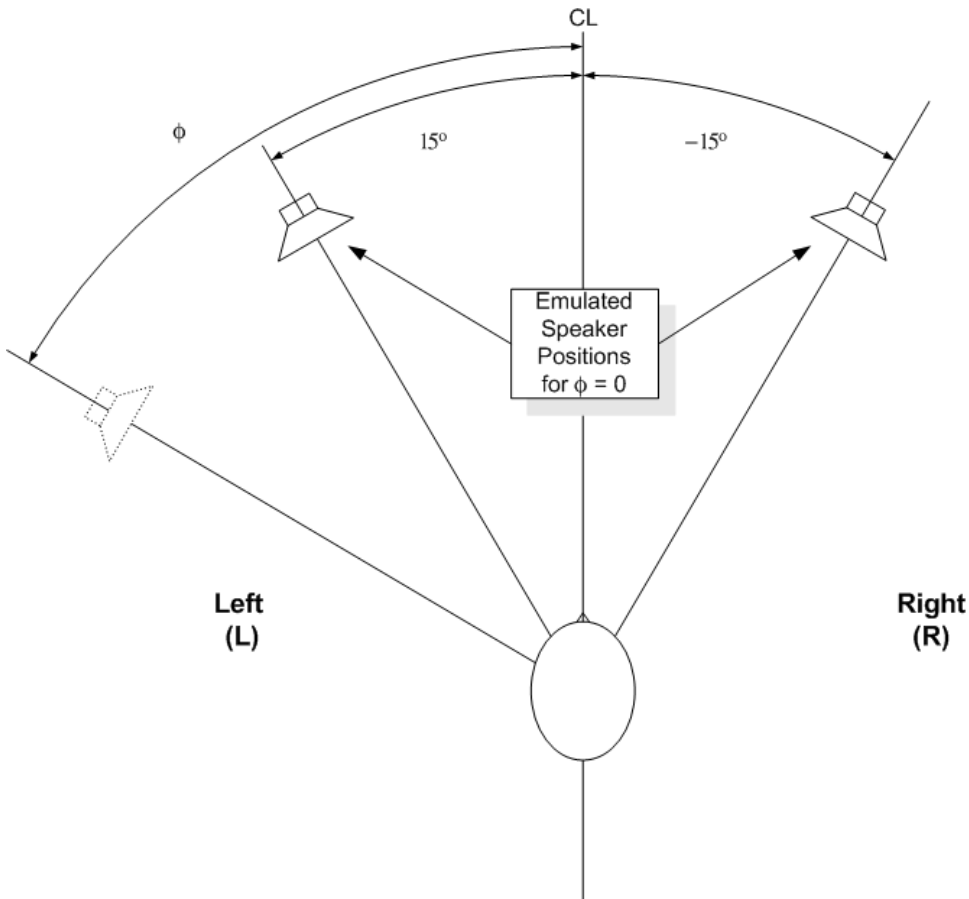
The About button presents



## Overview

This particular version of the Sound Engine is designed specifically for use with fully enclosed headphones. The localisation effect will be diminished or distorted if open-air speakers are used.

The Velocity Sound Engine Demonstration software version 1.0.0 is based on the following speaker geometry:



where the synthesised speakers are positioned in front of the listener, symmetrically, with  $30^\circ$  of angular separation.

The angle  $\phi$ , of the virtual speaker, can be changed continuously by dragged the speaker icon in the Control window, which appears once an appropriately encoded wave input file has been selected.

This particular version of the demonstration restricts the type of input files to be PCM encoded stereo with 8 bit resolution and sampled at 44.1kHz. Other versions of the software that admit higher resolutions and different sampling rates are available.

In addition to providing rotation modification of the sound some radial attenuation has also been included, where the sound intensity falls off as  $1/r^2$ .