

## MicSimulator

### Contents

MicSimulator is supplied as a zip file, micsimulator.zip. When unzipped it should contain:

MicSimulator.exe  
CT\_Pro.dll

and this information file. You may also like to download the file *test.wav* which contains a test signal comprising a swept tone, impulses and pink noise.

### Description

MicSimulator simulates the effect of moving a sound source in 7.5 degree steps across a 90 degree arc in front of a stereo microphone layout of the user's choosing. Six different mic layouts are offered. It does this by processing a mono 16-bit Wave file containing an anechoic recording of a solo musical instrument. Such files can be downloaded from Angelo Farina's web site at [www.ramsete.com/public/aurora\\_cd/anechoic/farina](http://www.ramsete.com/public/aurora_cd/anechoic/farina) and from [www.ymec.com/hp/pref2/dry.htm](http://www.ymec.com/hp/pref2/dry.htm). Of the files on offer, I would suggest *weber2.wav* and *moz-0.wav* from the Farina site, and *sk.wav* and *sl.wav* from the YMEC site (make sure you download the Wave files, not the MP3 equivalents).

### System requirements

MicSimulator should run under any Windows 32-bit operating system, from Windows 95 onwards. It has been tested on Windows XP Pro.

To run, MicSimulator requires that the supplied CT\_Pro.dll be installed in the same directory as the executable. This contains the runtime files of Perfect Sync Inc's Console Tools Pro (<http://perfectsync.com>) which provide enhanced control over the console window's appearance and function. An error message will be generated if you attempt to run the program without this DLL in the same directory. Note also that you cannot run the executable from the file list of the unzipping utility.

### Operation

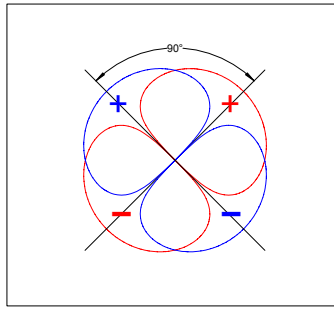
FaulknerDownsample's operation is self-explanatory. It first asks you to identify the Wave file to be processed. This must be mono and of 16-bit resolution. If the specified file does not meet this description then an error message is generated and you must respecify the file. Note that, unless the file is in the same directory as the executable, you must specify a full path (including the .wav extension), eg *c:\audio\weber2.wav*. If the specified file is of the correct format, its details (number of channels, sample rate, resolution, length and duration) are displayed. Next the program asks you to specify the mic layout you wish to simulate and a name for the output file (which must again be a full path, complete with .wav extension). Execution then begins.

A description of the different mic layouts and details of the simulation are given in the next section.

### Mic layouts

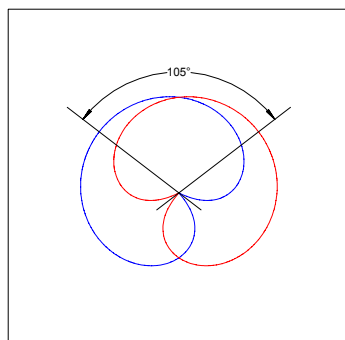
MicSimulator allows you to simulate six different microphone layouts:

**Blumlein crossed pair** – two coincident bidirectional (figure-of-eight) microphones aligned at 90 degrees to each other and at 45 degrees to the straight-ahead – see diagram below



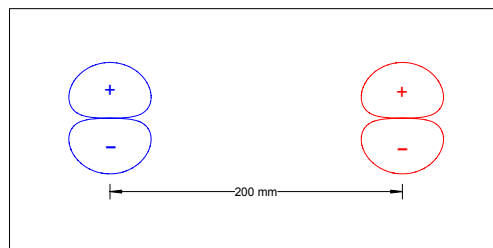
*Blumlein pair*

**Coincident cardioids** – two coincident cardioid microphones at an included angle of 105 degrees – see diagram below



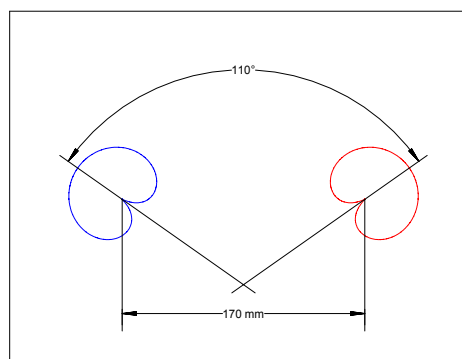
*Crossed cardioids*

**Faulkner 'phased array'** – two bidirectional microphones facing straight ahead, separated by 200mm – see diagram below



*Faulkner 'phased array'*

**ORTF near-coincident pair** – two cardioid microphones angled at 110 degrees and spaced by 170mm – see diagram below



*ORTF near-coincident pair*

**Two spaced omnis** – two omnidirectional microphones spaced by 2m, with the straight ahead at right angles to the midpoint of the line intersecting them

**Decca three-omni tree** – as two spaced omnis but with a third omnidirectional microphone midway between them and 1.5m in front

The distance of the sound source is taken to be 10m from the centre of the mic array (*ie* 10m from the intersection of the line joining the 2m-spaced omnis in the case of the Decca tree). Amplitude differences at the two microphones are not simulated for the two near-coincident layouts (Faulkner and ORTF), only the time delay. Both amplitude differences and time delays are simulated for the two spaced omni layouts.

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Keith Howard  
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