

Lab Report 2

Rotary Loudspeaker Effect

Ryan Brennan

Digital Audio Systems, DESC9115, Semester 1 2012

Graduate Program in Audio and Acoustics

Faculty of Architecture Design and Planning University of Sydney

Syntax

```
[vibrato_ammmodL vibrato_ammmodR rotary_speaker] =  
rotaryspeaker( modfreq, width, fc)
```

Description

The rotary Loudspeaker effect is used to create a realistic digital emulation of a classic rotary loudspeaker such as a Leslie amplifier. It uses three main effects combined to create this, Vibrato, Amplitude modulation and chorus. The result will produce a WAV file named “rotating_speaker_effect” that will be automatically played.

A low frequency oscillator ‘modfreq’ controls the vibrato variation.

The Amplitude modulation is used to control the intensity of the spinning effect created by a rotary loudspeaker. This is controlled by fc within the syntax.

The chorus effect is there to help give the effect of Doppler shift that is created from the reflections within the Leslie box. The variables for this have been pre assigned for what I believe to be the best sounding mix. However if you wish to change them the major variable is the mix of chorus as it is added back together with the post vibrato and amplitude modulated signal. $vibrato_ammmodL = (y.*0.002) + (vibrato_ammmodL.*0.998)$; In this case y is the chorus signal and $vibrato_ammmodL$ is the dry signal.

The best-input values for modfreq, width and fc for a natural rotary loudspeaker sound are as follows:

modfreq = Between 1 and 5

width = Between 0.001 and 0.005

fc = Between 1 and 5

Examples

A conventional sounding rotary loudspeaker effect can be created with the following;
[vibrato_ammmodL vibrato_ammmodR rotary_speaker] = rotaryspeaker(2, 0.001, 2)

Diagnostics

If `modfreq`, `width` and `fc` are not between the values given then the effect will sound unrealistic. It is still usable if that is the effect desired but it will no longer represent a classic rotary loudspeaker. Changing the chorus mix will produce to larger amount of white noise to the effect.

References

[1] U. Zolzer, "Filters and Delays," in DAFX: Digital Audio Effects, England, West Sussex: JW & Sons, 2002, pp. 86 – 88.

[2] Luis Miranda Jofre, week 5 tutorial, 'mysinewave'.