

FM Synth: The Game

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While recognizing the role interfaces play in creativity, it is equally important for creators to develop their skills in order to achieve their creative goals. "FM Synth: The Game" is an interactive learning application which combines a fully featured FM synthesizer with two ear training activities structured as games. The application fosters the aural facilities and creative uses of FM synthesis, including skills that are transferable to other sound synthesis techniques and the creative use of sound in general.

Background

Learning FM synthesis requires practical experience, but the main practical learning methods (e.g. Chowning and Bristow 1986) were written with specific synthesizers in mind which are no longer available to most musicians. This can make it difficult for a newcomer to follow the practical examples needed to learn the technique. Innovative interfaces can help beginners to vary pre-made sounds, but there is no replacement for skill earned through deliberate practice.

The Game

"FM Synth: The Game" uses hands on ear training games to introduce the player to FM synthesis one parameter at a time. The games encourage the player to develop an intuition for the tendencies of these parameters, helping them to learn the general principles of FM synthesis which apply to all FM synthesizers as well as most other situations involving audio frequency modulation (e.g. amplitude modulation, filter frequency modulation, and pulse width modulation).

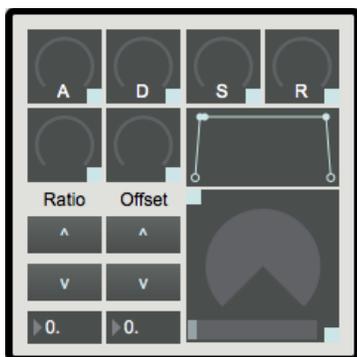


Fig. 1 Example synth controls

In the main game, the player is presented with two FM synthesized sounds; a fully programmed target sound, and an initialized sound. The objective is to alter the initialized sound by manipulating the on screen synthesizer controls in order to reproduce the target sound as accurately and as quickly as possible. Each target sound is presented as a level in the game. As the player progresses through the levels, they are introduced to FM synthesis while recreating musically interesting sounds using their ears. Unused controls are hidden from view, allowing beginners to learn as they go. The interface also offers feedback by changing a square indicator on each control from red to yellow to blue as the control is set correctly (fig 1.).

In a secondary mini-game, the player can practice their familiarity with C:M ratios. The player is presented with 4-8 buttons with C:M ratios written on them (fig. 2). An FM sound is repeatedly played as part of a musical soundtrack. The objective of the game is to correctly identify the C:M ratio of the sound, and press the corresponding button. If the player is successful he or she wins a point and the ratio changes. If the player incorrectly identifies the sound, then he or she takes damage. The game ends when the player takes too much damage or wins enough points. Because the number of ratios to choose from is small (4 to start with), even a beginner can learn to hear the difference between the different sounds which correspond to each ratio after making a few mistakes.

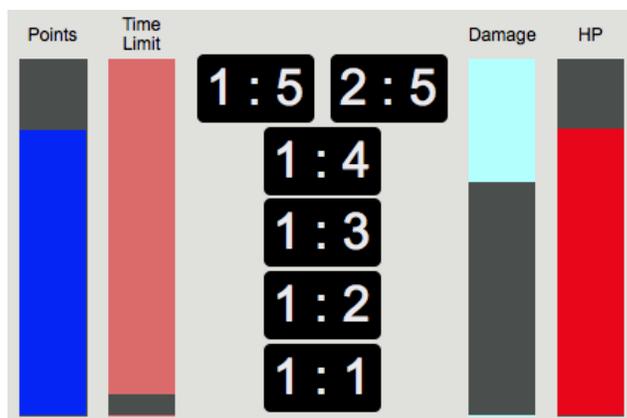


Fig. 2: C:M ratio identification mini-game interface with C:M ratios in the middle, and other game stats on sides