Zen Composer Instruction Manual

I. Introduction

The traditional piano keyboard has stood the test of time but can be a daunting compositional tool, both because of the constrained linear relationship of the keys which can often obscure harmonic relationships, and the fixed key assignments (matching the C major scale). Electronic variations on the keyboard provide for additional features such as single key chord playing, arpeggiation and the like. And there are variety of specialty keyboards having unusual layouts and scale patterns.

The Zen Composer is intended to provide an accessible open source alternative for individuals who can program and want to move beyond current commercial offerings, whether it is to experiment with microtonal tunings, advanced heuristics such as voice following, or new key mappings. In this regard, the Zen Composer provides a simple hardware platform and open source software (MIT license) that can be readily modified as desired. The Zen Composer is a MIDI keyboard suitable for use with most digital audio workstations.

II. Programming philosophy

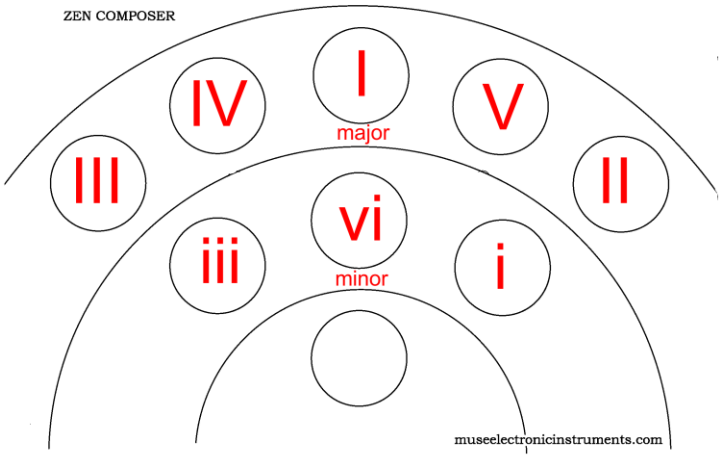
In keeping with its purpose, the Zen flute program attempts to be not only open source but also "friendly source" making it accessible to individuals who are not primarily programmers. The definition of "friendly source" is a work in progress and the current Zen Composer program does not always live up to this goal, but generally the intent is to write a program with the beginner programmer in mind and an understanding that the reader may have little background as to the purpose or function of the program. The Arduino style guide is a good starting point (https://docs.arduino.cc/learn/contributions/arduino-writing-style-guide)

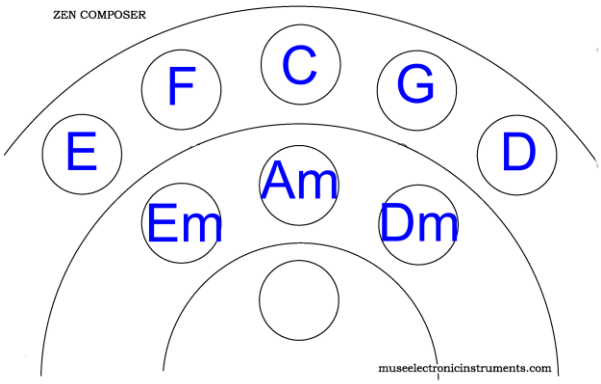
The current software provides a set of different modules described in the Mode chart, that provides for a chord board (playing a different chord with each pad), a standard keyboard, a workflow keyboard allowing successive drum track/bass track/harmony track and melody looper, a dual keyboard, allowing part of the keyboard to select notes of chord and the other part to select the chord, and the Euclid drum pattern generator. These modes are currently being used for musical composition and intended mostly to provide for inspiration.

The Zen Composer is published under the MIT license which allows for use of the software for personal or commercial purposes. Muse Electronic Instruments asks that you support our ongoing development by purchasing hardware and kits.

III Keyboard layout

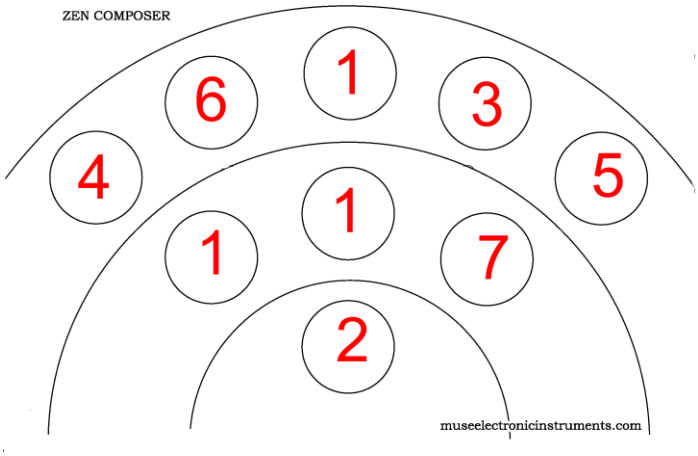
The keyboard layout is intended to provide for two dimensions of spatial separation between the keys better exploiting of our ability to remember multi-dimensional spatial patterns and to allow two-dimensional clustering of keypads with respect to harmonic relationships. Generally the layout mimics a portion of the circle of fifths While also providing a row/column orientation with five columns:



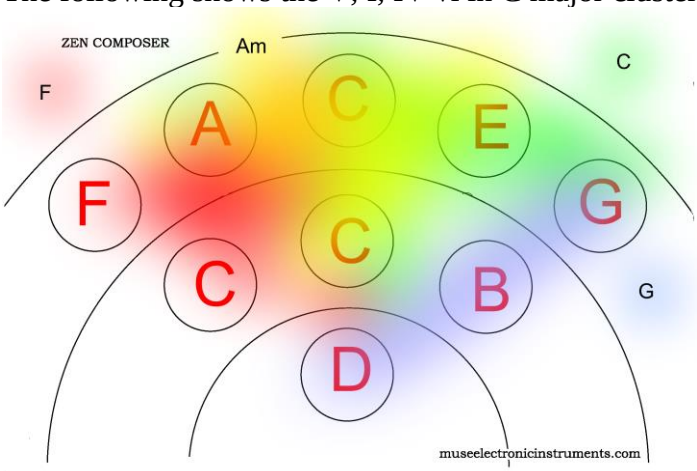


The circle of fifths layout is helpful in working out chord patterns when the Zen Composer is configured to play individual chords with each keypad pressing.

When the Zen Composer is used for piano type play, the two-dimensional layout allows for note clustering by harmonic relationship, for example



The following shows the V, I, IV vi in C major clustered.



Of course, this is open source software, so readily modified for any mapping that may be desired.

IV Hardware Description

The Zen Composer provides nine capacitive and velocity sensitive keypads and three analog potentiometers that can be arbitrarily assigned to control parameters. Currently, the potentiometers are used to select keyboard modes and subsets within those modes, however they can be used for any programming purpose including tempo adjustment pitch adjustment etc. The metallic pads on the top of the Zen Composer are individually addressable capacitive switches. Velocity or volume adjustment is obtained via an on board accelerometer that detects how hard the keys are struck. Currently there is no after touch.