1023-51-689   **William A Sethares*** (`sethares@ece.wisc.edu`), 1415 Engineering Drive, Madison, WI, and **Andrew Milne** and **Jim Plamondon**. *Consistent Fingerings for a Continuum of Syntonic Tunings.*

A continuous parameter generates a continuum of syntonic tunings that can be mapped to a button field so that the geometric shape of each musical interval is the same across all keys and throughout all tunings in the continuum. This has three advantages. First, having a single set of interval shapes within and across all keys of one given tuning (such as 12-tet) makes it easier to visualize the underlying structure of the music. Second, having this same single set of interval shapes across the entire syntonic tuning continuum makes it easier for musicians to explore the use of alternative tunings such as 1/4-comma meantone, Pythagorean, and 19-tet. Third, assigning the continuous parameter to a control interface enables a unique form of expression: dynamically (re)tuning all sounded notes in real time.

There are two mappings: one tempers from an arbitrary regular tuning to one that can be represented by a finite number of generators. The second mapping, from the generators to the button field, is easier to characterize. Translation invariance is shown to be equivalent to the linearity of this mapping, and consistent fingering occurs when the linear mapping is also invertible. The hexagonal layout of the Thummer keyboard is used as a concrete example. (Received September 25, 2006)