

Tuning a Score

Once a tuning is described, it can be used to affect the performance of a score. Notes in a score that refer to pitch names or MIDI Key Numbers, rely on the *installed tuning system* for their actual frequencies. To retune a score:

Insure that notes in a score contain MIDI Key Number parameters or pitch names rather than actual frequencies.

Install a tuning system that describes the desired associations between key numbers (or pitch names) and frequencies.

Each Keyboard maintains a tuning system that may be installed via the **Tuning** menu. Once you have a tuning described in **Just** (See *Keyboard Windows* or *Menus* in the **Help Panel**), installing it is straightforward. Insuring that your score uses key numbers or pitch names rather than absolute frequencies, and creating a Keyboard that contains Keys for all the pitches in a score is a little

more involved. The difficulty of this task depends mainly on the score.

If the score employs a regular 12-tone equal-tempered tuning, then there is a predictable 1-to-1 correspondence between pitch names and frequencies. In this case you may describe a regular 12-tone equal-tempered Keyboard with default key numbers, then retune individual keys to their desired frequencies. To install a tuning for this kind of score you need only use steps **4)** through **6)** below.

If the score employs non-Western tuning, associations between pitch names and

actual frequencies may be arbitrary. These scores require a little more work.

1) New From Score...

To determine what frequencies and key numbers are used in a score, create a new Keyboard with the **New From Score...** menu item in the **Tuning** menu. This will create a Keyboard containing a Key for each unique frequency in the score. Not all scores use MIDI KeyNums for pitch information. Many use an explicit frequency parameter. In these cases, key numbers given in the Keyboard will be

those closest in frequency to each Key. For 12-tone equal tempered scores, key numbers and frequencies have the normal associations found on a piano. Scores that are not in 12-tone equal tempered tuning will have key number to frequency associations that are not standard, and may, in fact, contain distinct frequencies that, because of their proximity to each other **do not** have distinct MIDI key numbers. For example, if a score contains notes with frequencies of 440 Hz. and 443Hz, both may likely have MIDI KeyNums of "a4". In this case there is not a 1-to-1 correspondence between MIDI Key and frequency in the score. To retune this score, one of these KeyNums needs to be changed to a KeyNum unique for

the score.

2) Sequence KeyNums

If you don't wish to inspect and change duplicate key numbers by hand, you may insure unique key numbers for all Keys in a Keyboard by using the **Sequence KeyNums** menu item in the **Tuning** menu. This will assign sequential KeyNums to all Keys starting with the KeyNum set for the lowest Key. If you wish to sequence a subset of your Keyboard, you may select multiple Keys and use the

Sequence KeyNums menu item in the **Edit** menu. This will sequence only those Keys currently selected starting with the KeyNum for the lowest Key in the selection.

3) Map KeyNums to Score

Once you have unique key numbers for each frequency in the Keyboard, you need to transfer these unique KeyNum/frequency associations to your score. This will insure that distinct frequencies in the score have distinct KeyNums as

well. Use the **Map KeyNums to Score** item of the **Tuning** menu for this. This will change KeyNums/frequency associations in the score to those given in the Keyboard.

4) Strip Freqs

Now that you have a score with unique key number parameters for each unique frequency, you need to remove any explicit frequency parameters in the score. This will force the score to rely on the *installed tuning system* via it's key numbers

for tuning. This is done with the **Strip Freqs** item of the **Score** submenu.

5) Install Tuning

Now the tuning described in your Keyboard may be installed with the **Install Tuning** or the **Install Tuning w. Octaves** items in the **Tuning** menu. The score may now be played with the tuning described in the Keyboard just installed. Your Keyboard may be used as a tuning template for this score. It may be duplicated (**Duplicate** in the **Tuning** menu) and retuned to describe different

tunings for the score. Use this template to create other tunings for your score.

6) Save Your Score

Be sure to save your score if you want to retain it's new Keynum mappings. Saving a score will cause all the tuning information to be saved as well.