

# Pitch Shifting

A pitch shifter transposes a copy of the input signal. It includes coarse and fine controls to change the processed pitch, delay controls, and mix. MIDI can be used to change the degree of pitch change on the fly. In sampling the sound source, a pitch shifter chops the sound into small chunks. Each section is then processed. This is necessary because of the fact that the processed sound will be longer or shorter (depending on the kind of pitch shift) than the inputted sound. If the pitch shift is higher than the original, the small chunks will have to be repeated for the processed sound to sustain as long as the inputted pitch. If the pitch shift is down, the chunks will have to be shortened and only part of the sample is used. These chunks of sound are then spliced together and cross faded to remove pops.

Musically, adding an additional pitch creates a thickening of the sound. Done very subtly, pitch shifting can produce a much stronger and fatter musical line. Pitch doublings at the unison, fifth, octave, whatever, create a focus on that line. Leave space for it!

In software pitch shifters, the processed pitch can be set to conform to a particular scale. Out of tune notes can therefore be bent in-tune, and vibrato may be added or taken away.

Formants – The shifting of vocals produces new pitches, but does not retain the physical properties of the singing. For instance, a person with a large vocal chamber may sing a note and the pitch shifter will transpose the note upwards. However, the fact that the singer has a large chamber is not transposed by the processor. This produces the famous “Mickey Mouse” phenomena. Formants correct this problem.

Voice Imitation – It will soon be possible to select a favorite singer’s voice for a patch, sing a note, and have your note processed so that it sounds like Sinatra, or Bob Dylan!