

FSeqEdit Help

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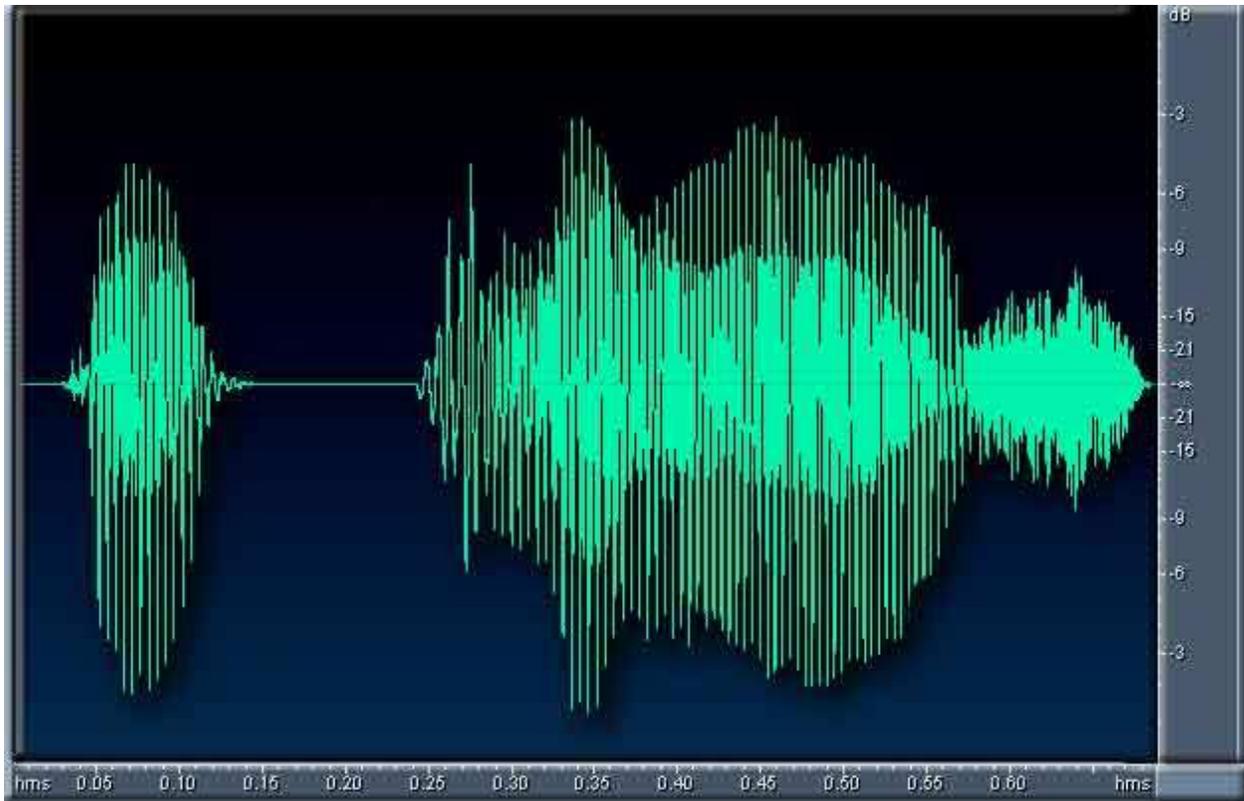
Note: the guide has been unfinished and likely to remain so, although some of the sections are no longer necessary (in 2022, system requirements are no longer an issue).

What does this program do?

This program is an editor for FSeq data. FSeqdata is a native format for Yamaha's FS1R, that stores formant information needed to recreate sounds, much like samples. Features like a tracker style editor, importing of wave files, drawing formants as lines, moving and scaling of formants etc should give you the possibility to actually use the features of your FS1R that makes the machine so special. You've paid for it damnit.

How does it work?

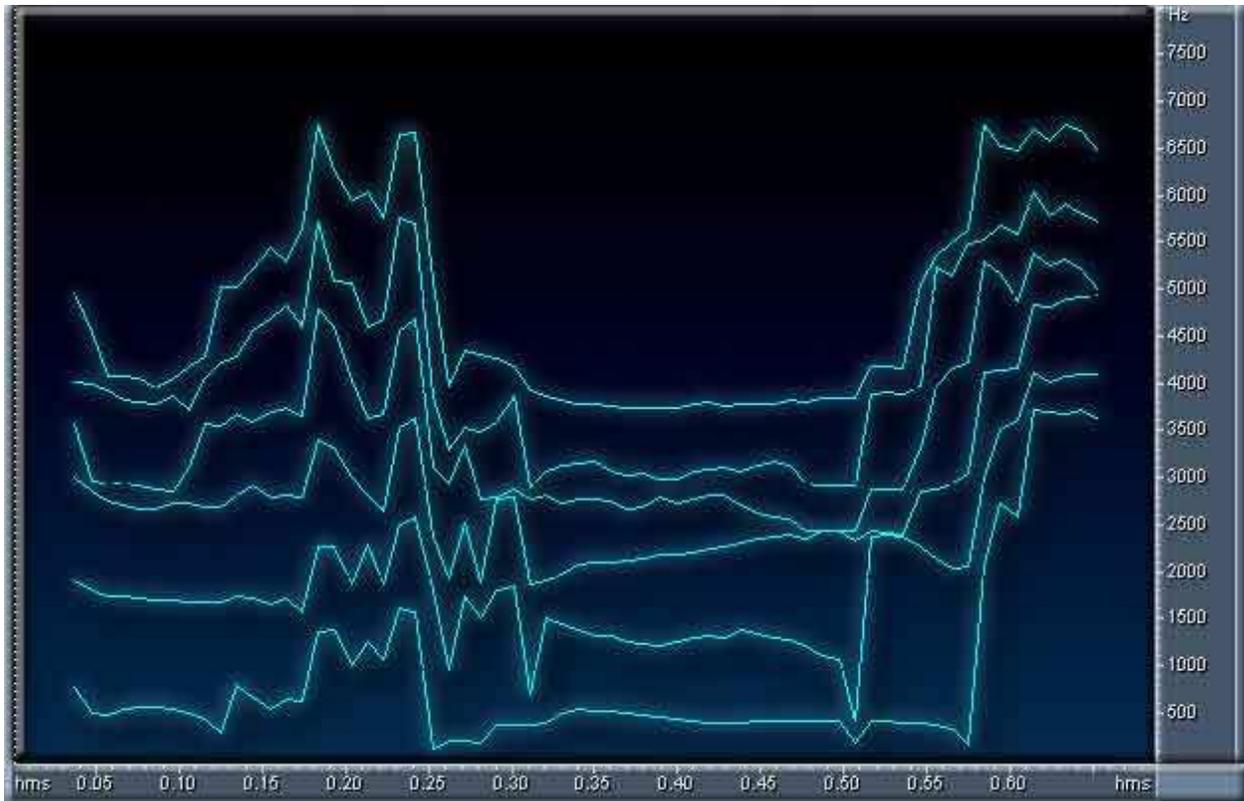
I'll explain it with an example. This is a short snippet of the recorded voice of a friend of mine. She sings 'a place'. The sample looks like this:



When we look at the spectrum of the sample, you'll notice that human voices consist of lines and random dots. The lines are called 'voiced formants'. The more random dots are called 'unvoiced formants'. The most prominent line (most of the times the lowest) is called 'fundamental pitch'. You also see that the formants are not equally strong all the time. So each formant is a series of formant/amplitude pairs. Hearing only three formants is enough to make understandable speech, but for extra realism the FS1R supports up to 8 voiced and unvoiced formants.

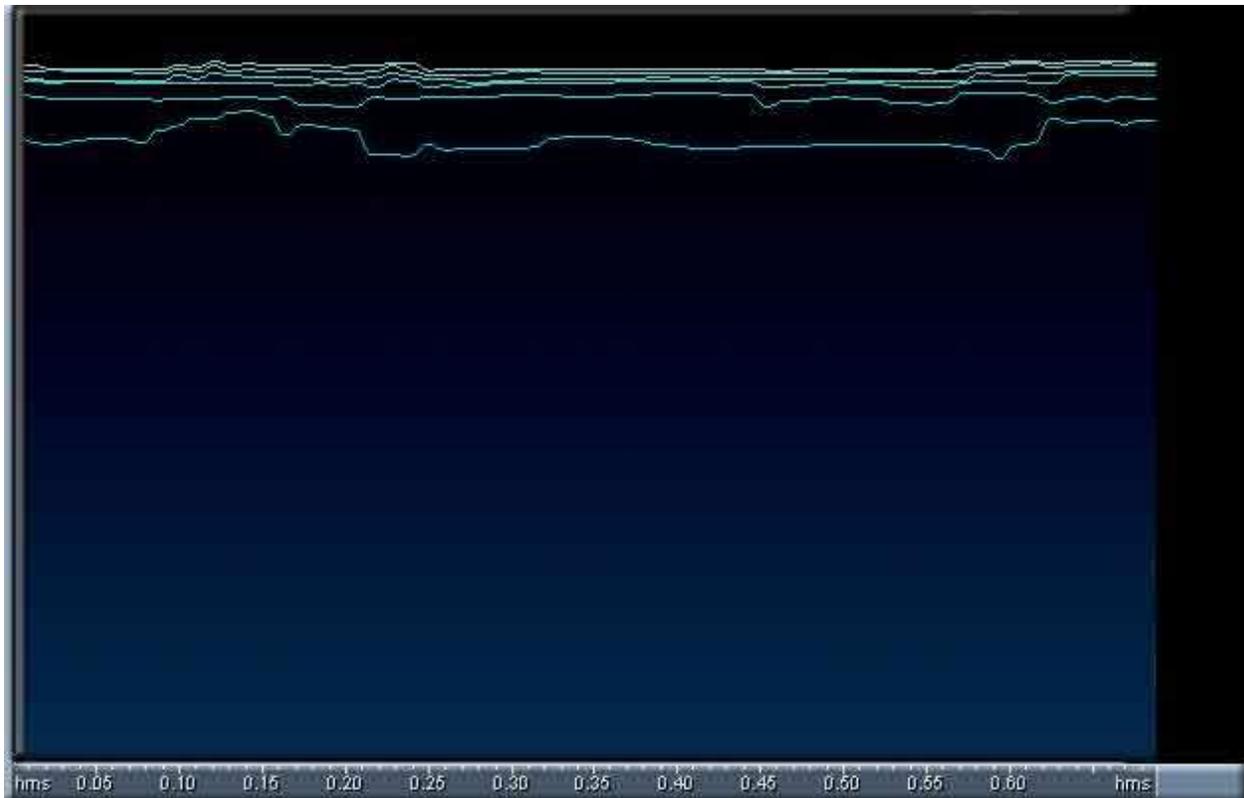


A spectrogram like this takes up a lot of space and it's not easy to tweak each specific formant. That's why the FS1R stores only the frequency and amplitude of each formant. With some mathematical magic we can come up with this approximation of the formant frequencies:



Linear Formant Frequencies

After this data is imported into fseqedit, it will sort of look like this:



Formant Frequencies in FSeqEdit

Why does this look different?

Well, that is because in FSeqEdit, you see the formants in the way they are stored in the FS1R. Frequencies are not stored as hertz, but as notes. This means that higher frequencies are stored less accurately than the lower ones. The good thing is that our ears work the same way, so you won't notice.

How do we know which formants are voiced, and which ones are unvoiced?

The internal preset FSeqs of the FS1-R does it like this: Find the 8 most prominent frequencies and its amplitudes, and the fundamental pitch. Unvoiced formants are muted, unless no fundamental pitch can be found; then the voiced frames are muted instead.

This causes sudden changes in amplitude, and does not always sound good. Therefore, FSeqEdit allows you to use another method. This splits everything at a certain frequency. Everything below this frequency is assumed to be voiced, and the rest unvoiced. Using this method it's possible to have more complex sounds, because voiced and unvoiced frequencies are different, and can sound simultaneous.

wouter_van_nifterick@hotmail.com