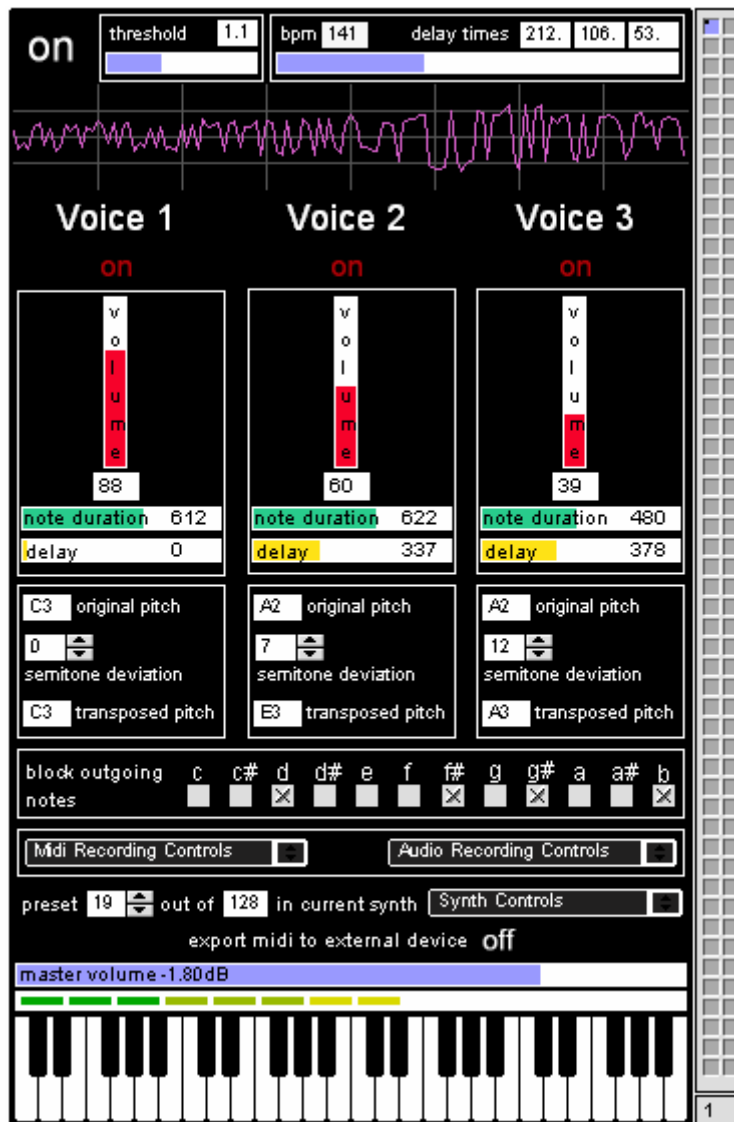


# Music Accompaniment Tool Application

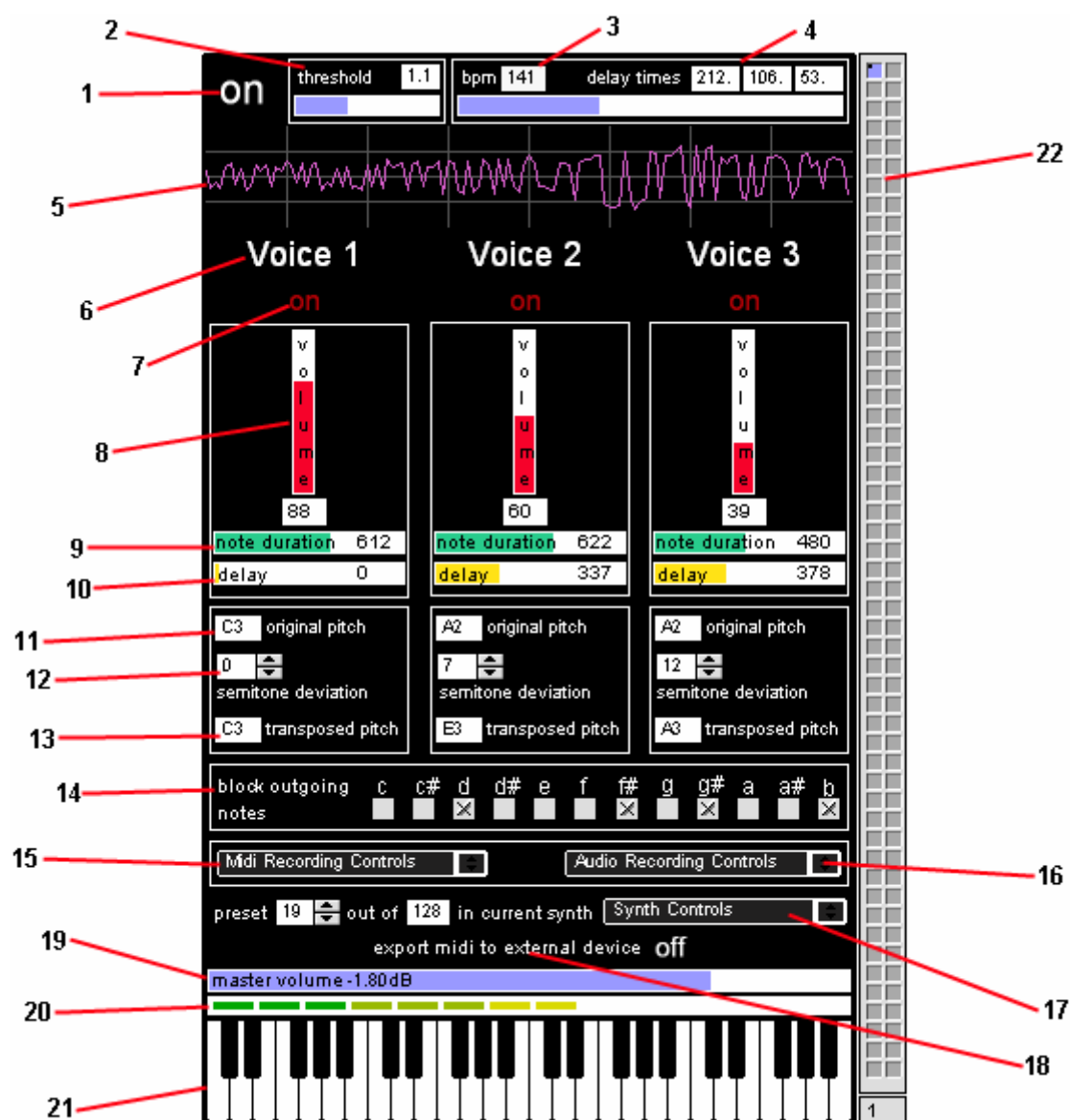
Written in Max/Msp by Nikos Karavas



## **Brief Technical Overview**

This application detects pitch from incoming audio and generates the respective midi note information. According to user settings the midi note information is manipulated to produce generated notes at different amplitudes, pitches, and times. Up to three notes can be generated at the same time or in sequence for every pitch that is detected. The generated + manipulated midi note information is fed into a vst instrument and/or can be exported to any midi enabled software/hardware device. Midi and audio recording functions are also included as well as the built in ability to control the loaded synth.

## The Application – explanation of the features



**1. On/Off** – Turns on/off all the audio in the application

**2. Threshold** - Controls the threshold of the noise gate included within the application. The function of the noise gate is to allow the accompaniment to commence only when the incoming audio passes the set threshold. Also, as the incoming audio falls below the threshold the accompaniment stops. This eliminates any undesired/unexpected accompaniment – as the musician’s performance begins so does the accompaniment, when the performance ends so does the accompaniment.

**3. BPM** – The purpose of this is to allow for the generated accompaniment to be in time with the musician’s performance. This is set by the user according to the tempo of the performance.

**4. Delay Times** – These are delay times in milliseconds generated according to the bpm set by the user. These values can be used when setting the note delay (explained below).

**5. Graphical Signal Display** – This shows the incoming audio in a waveform display. This is useful as it allows the user to establish if any problems are occurring with the incoming audio. It also helps to set the threshold in the noise gate.

**6. Voice 1 / 2 / 3** – The inclusion of three “voices” allows for up to 3 notes to be generated at the same time or in sequence for each pitch that is detected from the incoming audio.

**7. On/Off** – Turns on/off the respective voice.

**8. Volume** – Sets the amplitude of the respective voice. The range is 0 – 127 midi values.

**9. Note Duration** – Sets the duration of each generated note in the respective voice. The range is 0 – 1000 milliseconds.

**10. Delay** – sets the amount of time that the application will wait to generate a note since the original detected note.

**11. Original Pitch** – Displays the original pitch detected by the application.

**12. Semitone Deviation** - Allows the users to change the pitch of the respective voice/generated notes by a number of semitones.

**13. Transposed Pitch** – Displays the new pitch of the generated note according to the semitone deviation.

**14. Block Outgoing Notes** – This feature allows the user to block specific generated notes from being outputted.

**15. Midi Recording Options** – Gives the user the opportunity to store the generated accompaniment to a midi file. The options included are:

1. Record to Buffer,
2. Stop Recording/Playback,
3. Playback
4. Cut Initial Silence
5. Write to Midi File
6. Load Midi File

**16. Audio Recording Options** - Gives the user the opportunity to store the generated accompaniment to an audio file as well to load audio files to be played. The options included are:

1. Choose File to Record To
2. Start Recording
3. End Recording
4. Load Audio File
5. Play Loaded Audio File
6. Stop Loaded Audio File
7. Loop Loaded Audio File
8. UnLoop Loaded Audio File

In the case of recording to a midi file the recording must take place before selecting the file to write to. With audio recording the opposite must happen, a file to record to must be chosen first.

**17. Synth Controls** – Allows the user to control the loaded synth. The midi generated midi note information is fed into the loaded synth to produce the musical accompaniment. By default the loaded synth is “Crystal” and contains 128 presets. Any vst instrument synth can be loaded into the application.

The options included are:

1. View Current Synth
2. Load External Synth
3. Save Personal Preset
4. Load Personal Preset

In this section of the application the default number of presets in the loaded synth is displayed as well as the option to change from one to another.

**18. Export midi to external device** – Gives the user the option to export the midi note information to any midi enabled software/hardware device. This option can be turned on/off. By double clicking on this a list of available devices appears.

**19. Master Volume** – A slider which allows the user to adjust the signal amplitude coming from the vst instrument synth. Its value is displayed in decibels.

**20. Signal Level Meter** – Allows the user to see the signal level output pictorially. It is useful for seeing when the outgoing audio is “in the red”.

**21. Keyboard** – Gives the user a quick and easy way to preview the settings selected within the application.

**22. Presets** – Enables the user to save presets of the applications settings. Shift and click makes a preset. Click recalls a preset. The number box displays which preset is in use.

## **Limitations and Future Developments**

A small latency occurs as a result of the real time pitch tracking. According to the settings the latency can be less/more noticeable. To reduce this latency it is necessary to explore other configurations of the application as well as other pitch tracking objects. Nevertheless, it is possible for the musician to work with the latency and in combination with different settings and synths to produce interesting results.

## References

This application was constructed by Nikos Karavas using Max/Msp Version 4.5.5 with input and help from Dr Martin Parker.

The following external objects were used:

fiddle~            Pitch following and sinusoidal decomposition by Miller Puckette  
qs.vstizer        MIDI-to-VST message morpher by Darwin Grosse

These objects can be found at [www.maxobjects.com](http://www.maxobjects.com)

The noise gate portion of my application is a modification of Sky Frostenson's noise gate patch, which can be found here:

<http://www.illinest.net/dsp/index.php>