**Composition: Electronic Music I**
Fall 2014
Sound Mass—Fall 2014 Patch

1. The Sound Mass—Fall 2014 patch was made using the Max MSP programming language.
   a. This is a commercial software; to build and edit 'patches' (common name of programs designed in this software), one must purchase it from Cycling '74.
   b. A limited version, called Runtime, is available for free. It is not able to edit patches, only to open and operate them.
   c. If you would like to use this patch on your own computer, download Runtime from Cycling '74's website: http://cycling74.com/downloads/runtime
   d. Once the installer is downloaded and installation is complete, you will be able to open the patch file.

2. Patch interface
   a. The interface for the patch is pictured below.
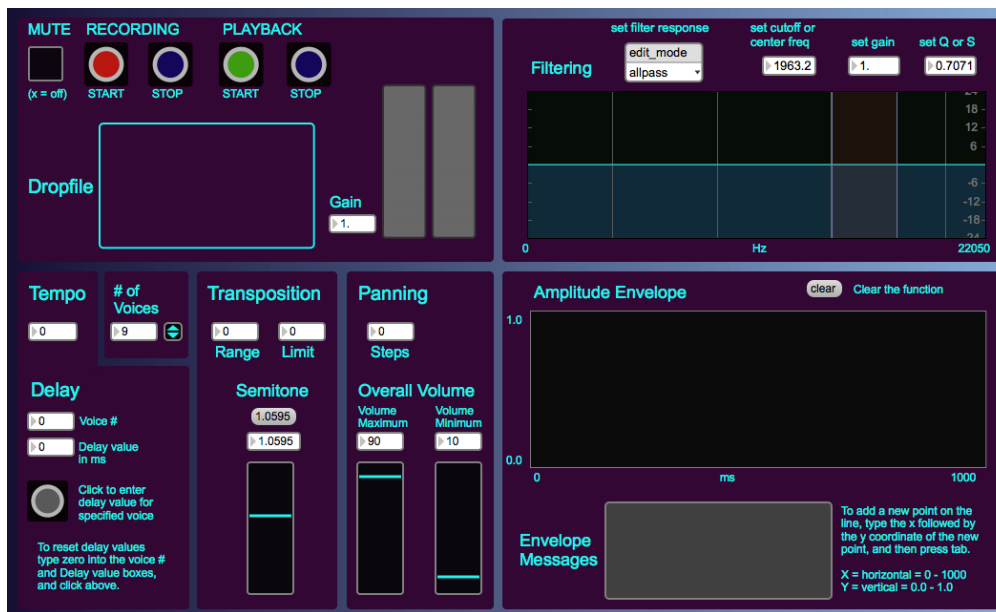
   b. It is organized into sections, grouping related functions together into one block.

3. Dropfile, Playback, and Recording
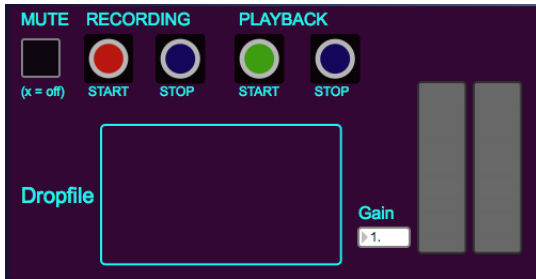
   a. Dropfile is where you drag your folder of audio files for playback and recording. This folder must be saved to the same location as where this patch is saved.
   b. The Playback controls allow you to demo what your sound mass will sound like. In addition to clicking on the start and stop buttons, pressing the spacebar will alternate between start and stop.
   c. The recording controls must be clicked on with the mouse.
      i. Clicking on start under the recording controls will start playback and start recording simultaneously. You can also press record while playback (letter b above) is already occurring.
      ii. Pressing stop under the recording controls will stop recording, but does not stop playback.
   d. The Mute button allows you to hear playback, or to turn it off. When you see an 'X' in the box, you will be able to hear the sound mass. In other words, mute is off, if the X is in the box.
   e. The large grey boxes are level meters for left and right channels (stereo).
   f. The Gain can be changed to increase the levels. The value inside the box can be changed in the following ways:
      i. You can type the desired number by clicking on the box. The grey arrow will turn yellow, then type the number, and press return.
      ii. You can click and drag with the mouse up or down to increase or decrease the values. Clicking on the left side of the decimal point will change the value on that side, while clicking and dragging on the right side of the decimal will change values on that side.
   g. Watch the level meters to make sure you are not adding too much gain. This will cause overs (clipping) to the soundmass. Red lights will appear at the top of the meters to indicate clipping, but only remain for a few seconds.

4. # of Voices

   a. This is where you enter the number of voices that will be sounding simultaneously.
   b. There are many ways to change the number of voices:
      i. You can type the desired number by clicking on the box. The grey arrow will turn yellow, then type the number, and press return.
      ii. You can click on the blue arrows to incrementally increase or decrease the number.
      iii. Do NOT change the value by clicking and dragging with the mouse up or down.
   c. You can change the # of voices in real time without stopping playback or recording.
   d. The patch is limited to a total of 50 voices.

5. Transposition
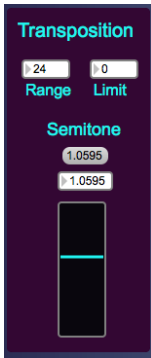
a. Transposition of the files occurs when we change the speed of their playback.
b. The Range is how far apart the lowest possible pitch and the highest possible pitch are from one another. A range of 12 gives you one octave, 24 a range of two octaves, etc.
c. The Limit sets the lowest possible pitch transposition. Zero means no transposition, and the file will play as is. The value of this box can go into negative numbers to transpose sounds down.
d. The semitone is where you set the distance between a half step. Mod 12 equal temperament uses the value 1.0595.
   i. There is a grey oval with that value entered inside of it. Clicking on this oval will reset the Semitone to that value.
   ii. If you desire a smaller semitone, click and drag the blue line down, or drag it upward to increase the size of the semitone. Notice, the current value is reflected in the number box above the slider.
   iii. You can also type into the number box.
   iv. The range of the semitone parameter is from 1.0 — 1.0999.

6. Panning
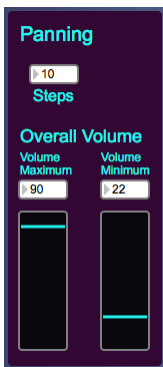
a. Steps is how many different locations you would like the sounds to have in either the left or the right speakers. More steps creates more subtle shifts, whereas less steps creates more drastic shifts in the sound.
b. Overall Volume is where you set how loud or how soft you would like the overall playback to be.
   i. Values can be changed by either typing or clicking and dragging into the number boxes, or by moving the sliders.
   ii. Having a high volume maximum and a low volume minimum will create a high variety of different volume levels in the stereo field.
   iii. If both have similar values, then the volume levels will always be consistent at that value.

7. Filtering
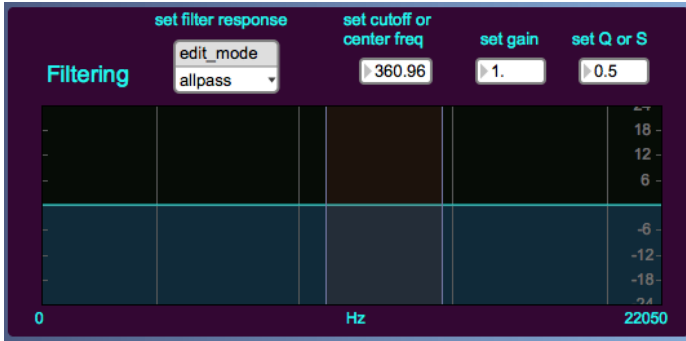
a. Filtering (EQ) is a global operation on the overall sound mass.
b. Select the type of filter you would like under the "set filter response" menu. Just click on the black down arrow, and a drop down menu will appear. Select the type you want, and the horizontal line in the EQ window will reflect this change.
c. You can set the cutoff or center frequency by either clicking on and dragging on the graph line inside the EQ window, or by typing into the number box above the EQ window.
d. Some filters allow you to change the gain level. Remember, clipping (overs) is possible if you go above zero dB, so use caution.
e. Some filter settings also allow you to change the 'Q' setting (how wide the band pass is).
f. If you desire no filtering, then use the allpass setting.

8. Amplitude
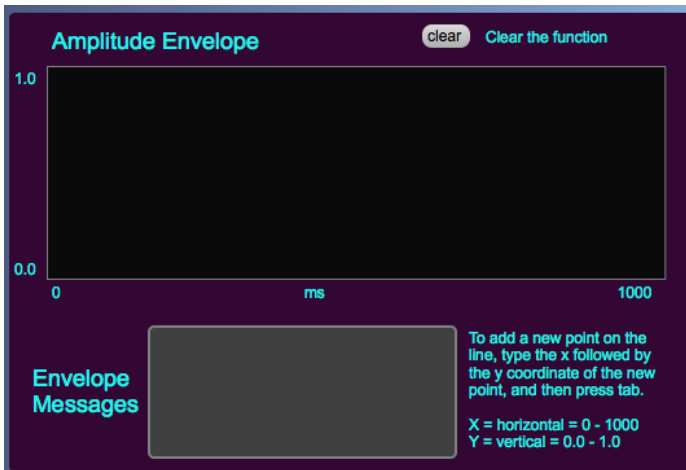
a. Amplitude Envelope is another global operation on the overall sound mass.
b. Clicking inside of the black box will add a point. Adding another point will draw a blue line between it and the original point. This line represents the overall change in amplitude. Add as many points as you'd like.
c. The vertical range of the amplitude is from 0.0 dB to 1.0 dB.
d. The horizontal range of the amplitude is from 0 to 1000 ms (1 second).
e. Pressing on the "clear" message in the grey oval will erase all points on the graph.
f. For more precision, you can type in the value of the point you would like to add on the graph.
    i. In the Envelope Messages grey box, you can click with the mouse, and a flashing cursor will appear.
    ii. Type a value for X (0 through 1000), followed by a space, and then a value for Y (0.0 through 1.0), and then press the **tab** key. Your new point should be added to the graph.
    iii. N.B. While the cursor is flashing inside the grey box, all other keyboard commands will be ignored. This means the space bar will temporarily not start or stop playback. Also, you can type the message "clear" and then press tab to erase the graph.

9. Tempo and Delay

a. This section allows you to add delay times to the different voices.
b. To add a delay values for specific voices, complete the following procedure:
    i.   Set the # of voices to zero.
    ii. Input the # of voices you desire.
    iii. Enter the voice number you would like to delay. Then, add the delay value in ms. Remember, a value of 1000 is equal to one second. You must click on the grey button below the number boxes in order for the value to be entered.
c. The Tempo number box allows you to change the delay times for all delayed voices simultaneously while maintaining their delay relationships. The value of the Tempo box is multiplied to the delay values of all of the voices that have delay values associated with them. For example, if voice 1 has a one second delay, and voice 2 has a two second delay, and you change the tempo value to 2, then they will each increase to two seconds of delay, and four seconds of delay, respectively.
d. Tempo values will not affect voices with no delay value. Voices with no delay values are set to zero. Thus, you would be multiplying the tempo value with zero.
e. To reset all delay values for all voices, enter 0 into the voice # box and then 0 into the delay value box, and then click on the grey button.
f. N.B.: A tempo value of zero will cause no delay in any of the voices, because $0(x) = 0$, where x is the delay value. However, the delay values are still stored with their respective voices. Thus, if you change the tempo value to a non-zero, then the delays will return and they will be multiplied with the tempo value.