# Notes on SYNTAL
# Chapter 8: Linking Multiple Sections (V.00.1)
# For OSX

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## The Problem: Long Pieces.

As a piece gets longer in duration it becomes useful to break it up into sections. In this way neither the input files nor the resulting sound files are unmanageably long. Errors can be easily corrected, and adjustments to each section can be made easily. This chapter addresses the problem of putting the sections together—technically speaking, concatenating them—so that you can synthesize and listen to the whole piece.

**Mixing Four Voices: A Review.** Let's start with an example. Suppose our piece is in four voices—that is, four separate input files—and that the finished result is to be played back through a stereo (2 channel) system. Suppose further that we have divided the piece into three sections; let's call them Section a, Section b, and Section c. Then let's say the name of the whole piece is 'cool'.

The key to the process is to keep track of all the files by means of a fixed naming convention. Start with the four files that specify the four voices in Section a. Let's name them 'coolaT1.c', 'coolaT2.c', 'coolaT3.c', and 'coolaT4.c'. We will compile and synthesize them by running them using the command 'csp' four times. The first command for the first voice is given here:

```
roger.ucdavis.edu5% csp coolaT1
```

Once all four files are synthesized (and played and corrected, etc.,etc.), then the next step is to make a 'mix' file to give them spatial locations and movements and to put a little reverb on them. A sample such mix file 'coola.sco' is shown below:

```
; File name:  coola.sco
; This is a .sco file for mixing four channels together

;         Loc. Gain
i 11  0    0.01 1.0 1
i 11  +    2.49 1.0 1
i 11  +    2.5 0.0 1
i 12  0    0.01 0.3 1
i 12  +    0.99 0.3 1
i 12  +    3 1.0 1
i 12  +    1 0.0 1
i 13  0    0.01 1.0 1
i 13  +    1.49 1.0 1
i 13  +    3.5 0.0 1
i 14  0    0.01 0.3 1
i 14  +    0.99 0.3 1
i 14  +    1 0.0 1
i 14  +    3 1.0 1
;              Soundin.w .x .y .z  L Rev.  R Rev
i 50  0    5          1  2  3  4    .2      .2
e
```

You actually do the mix by using the command **cmx4rev** as follows:

```
roger.ucdavis.edu6% cmx4rev coola
```

Notice that this mix file is a little different from the ones we've used in the past. In this case, the numbers of the 'soundin.x' files have to be specified as p4, p5, p6, p7 for the i 50 instrument. You'll see why in a little while.

**Joining Sections** So far this is pretty standard. After you've gotten each section done—that is after you've synthesized a total of 12 sound files, four for each of the three sections—then it's time to hear them consecutively. There are three things you need to do:

1. Write a master .sco file.

   This is essentially a combination of the three mix files for each of the sections—you'll remember that they're called **coola.sco**, **coolb.sco**, and **coolc.sco**. Following is an example of such a master .sco file:

```
;       File is: cool.sco

i 11  0    0.01 1.0 1
i 11  +    2.49 1.0 1
i 11  +    2.5 0.0 1
i 11  +    5.0  0.0     1
i 11  +    5.0  1.0     1
i 12  0    0.01 0.3 1
i 12  +    0.99 0.3 1
i 12  +    3 1.0 1
i 12  +    1 0.0 1
i 12  +    1.0  1.0     1
i 12  +    3.0  0.0     1
i 12  +    5.0  0.3     1
i 13  0    0.01 1.0 1
i 13  +    1.49 1.0 1
i 13  +    3.5 0.0 1
i 13  +    0.5  0.0     1
i 13  +    4.49 1.0     1
i 13  +    5.0  0.0     1
i 14  0    0.01 0.3 1
i 14  +    0.99 0.3 1
i 14  +    1. 0.0 1
i 14  +    2.   0.0     1
i 14  +    6.   1.0     1
i 14  +    5.   0.6     1
;                              L Rev.  R Rev
i 50  0    5      1  2  3  4   .2    .2
i 50  5    5      5  6  7  8   .2    .2
i 50  10   5      9 10 11 12   .2    .2
e
```

The part of the score that has to do with panning is the part that calls i 11, i 12, i 13, and i 14. The part that joins the three parts are the calls to i 50. As always, in Csound files, the second parameter is start time, and the third is the duration. In this case **coola.sco**, **coolb.sco**, and **coolc.sco**, are each 5 seconds in duration and each follows immediately after the one before it. *Notice the four numbers after the duration.* These are the soundin.x numbers corresponding to the three parts of our piece "cool".

2. Set up the correct soundin.x numbers.

   This is new. Always before, the **cmx4rev** command took care of getting the four sound files copied over to the files **soundin.1**, **soundin.2**,

**soundin.3**, and **soundin.4**. For sectionalized pieces, you need to do this separately; and of course you're not surprized that there is a new command to do that. It's called **sndin4**. You use it like this:

```
roger.ucdavis.edu7% sndin4 coola 1 2 3 4
roger.ucdavis.edu8% sndin4 coolb 5 6 7 8
roger.ucdavis.edu9% sndin4 coolc 9 10 11 12
```

Now you'll have the twelve soundin.x files that you need to do the master mix.

3. Run the master mix.

   For this, all you need to do is use the new command **cat4rev**. Here's what it looks like:

   ```
   roger.ucdavis.edu10% cat4rev cool
   ```

   Then you'll have a sound file called **cool.aiff** that you can play as you wish.

That's simple enough, don't you think? Keep the names of the files straight and all will be well.