



The Music of the Hoh River Valley

This is a set of pieces evocative of a journey down the Hoh River drainage, from near the peak of Mt. Olympus in the Olympic National Forest of Western Washington to the Pacific ocean. The river descends 56 miles through glaciers, rocks and then a temperate rain forest. The Hoh River Valley is very wet; it is perhaps the wettest spot in the 48 contiguous states. The glaciers of Mt. Olympus receive about 100 feet of snow a year, and the lower forests of the valley get 240 inches of rain every year.

The pieces were all generated on my computer using Csound as a sampler based synthesizer. The samples are from the McGill University Master Samples CD ROM and some environmental sounds. They were written in February 2009 as part of the RPM Challenge, which is a call for musicians to get off their couches and record the CD of 10 songs or 35 minutes in a month. This is the second year I have taken the challenge and look forward to next year's as well.

1. Approaching the Bergschrund at Night

The winds tend to howl at this elevation, especially when the storms blow in from the Pacific. Warm wet clouds this evening had a eerie sound as they blew up the glacier from the west. In this case, a descending utonality from 3:2 to 6:5 to 1:1 to 12:7 to 4:3 to 12:11 to 1:1.



Near the top of the mountain, it is important to avoid the crevasse caused by the separation of the glacier from the summit. Often hundreds of feet deep, the Bergschrund can be a formidable obstacle in the wind at night.

2. Walking Down Blue Glacier

We spent all day Sunday running new takes, but something seemed to get in the way with each one. Finally we were able to get a good run through on the 17th try Monday morning. This one includes clarinet, oboe, tuba, marimba, vibes, finger piano, harp, and cello, plus the opening notch filtered wind tunnel sound recorded at the NASA Ames Research Center. As always, fake but accurate is my motto.



3. At the Terminus of the Blue

I was able to get the crew to come in early for one more take. We went out to the headwaters of Glacier Creek, where it moves down slope past a forest of high pines. Omar couldn't lug his tuba up this high, and the vibes player said no, but the clarinet, oboe, marimba, finger piano, and harp were included. Celebrate the otonality with triademonium to the 11 limit.

Blue Glacier starts near the top of Mount Olympus, and terminates into Glacier Creek, which eventually flows into the Hoh River.



4. The Rocks of Glacier Creek

The water moves quickly as it descends from the higher elevations. It tends to form eddies where the rocks block the flow. The water swirls to fill the gaps. Later, the rocks fall away and the water flows unimpeded down the valley. Soon, the rocks pile up and slow the water again.

The piece uses repetition with shifting combinations to emulate the movement of water around rocks. It's scored for environmental sounds and a small ensemble of skilled microtonalists. The environmental sounds are recordings of a gentle waterfall and some birds typically found at the confluence of Glacier Creek and the Hoh River or thereabouts. The birds are the Hermit Thrush, the Black Throated Blue Warbler, the Stellar's Jay, the Hairy Woodpecker, the Pileated Woodpecker, and the Warbling Vireo.

The small ensemble of skilled microtonalists includes clarinet, oboe, vibraphone, marimba, finger piano, cello, and harp. They are asked to accurately play the 53 TET scale, and also carefully slide up a set number of steps, for example, by 8 or 10 steps (approximating the ratios of 11:10 or 8:7 respectively). These guys are amazing in their flexibility and accuracy. I ask them to pick the chord inversion they want, and then slide up or down by a predetermined amount. My vibraphone player has perfected the art of bending his aluminum bars just the right amount to descend by a 6:7 (12 steps in 53-TET).

As always, this music is fake but accurate. Here is some of the coding for the sliding chords. The following is put through my Csound preprocessor to generate the necessary Csound code.

```
.slid-min3-u-a135 t+0&gls11:10. t+14&gls10:9. t+17&gls8:7.
.slid-min3-u-a351 o-1t+14&gls10:9. t+17&gls8:7. t+22&gls11:10.
.slid-min3-u-a513 o-1t+31&gls8:7. t+22&gls11:10. t+14&gls10:9.
.slid-min3-d-a531 o+1t+31&gls8:9. t-17&gls10:11. t-14&gls6:7.
.slid-min3-d-a153 o+1t+0&gls6:7. t-22&gls8:9. t-17&gls10:11.
.slid-min3-d-a315 t+14&gls10:11. t-14&gls6:7. t-22&gls8:9.
.slid-min3-u-b247 t+7&gls11:10. t+15&gls9:8. t+19&gls7:6.
.slid-min3-u-b472 o-1t+22&gls9:8. t+19&gls7:6. t+19&gls11:10.
.slid-min3-u-b724 o-1t+41&gls7:6. t+19&gls11:10. t+15&gls9:8.
.slid-min3-d-b274 o+1t+7&gls10:11. t-19&gls7:8. t-19&gls9:10.
```

```
.slid-min3-d-b427 o+1t+22&gls9:10. t-15&gls10:11. t-19&gls7:8.
.slid-min3-d-b742 t+41&gls7:8. t-19&gls9:10. t-15&gls10:11.
```

To call the chord, I just have to write code for each instrument, like this:

```
.mari-16-min-1f &mari.&key.e16w0d0h17&slid-min3-d-a*.d16
.mari-16-min-1g &mari.&key.e16w0d0h17&slid-min3-d-b*.d16
```

Then I call it when I want it to play like this:

```
&mari-16-min-1*.
```

The asterisk is a "don't care" character. This way, I can create several different note strings and let the computer pick the one it wants him to play at any given moment. Notice that the -a chords are the utonality triad to the 5 limit, and the -b are the higher overtones to the 11 limit. The chord slides from one to the other.

The &gls11:10. variables invoke a Csound function table that slides a note up or down over its duration by a very specific amount and timing. I basically multiply a note by a table of 256 values from 1 to a number larger or smaller than 1. Here is the relevant Csound code for a function table that slides a note to which it is applied by an 8:7. 8 divided by 7 is 1.14285714.

```
;## step start at 1, stay there for 48 of the 256 steps
; move to 1.14285714 over 128 steps
; stay there for 80 of the 256 steps.
f324 0 256 -7 1 48 1 128 1.14285714 80 1.14285714 ; 8:7 g23 up 10
```

5. Elk Lake Dancing



Elk Lake is a small alpine lake above Glacier Creek, before it empties into the Hoh River, with a nice small campground.

This is the final piece I was able to finish for the RPM Challenge. It is written for the same instruments as the others: clarinet, oboe, cello, finger piano, harp, marimba, and vibraphone.

I would have liked to include some Elk calls, but I ran out of time. The harmony is based on the otonality to the 15 limit, modulating down a scale derived from the utonality series. It's the same set of changes as my 2002 piece Mirror Walk.

Bb	16:9
A---	8:5
G---	16:11
F	4:3
D+	8:7
C	1:1
Bb	16:9

This is a descending scale, but the voicing from one chord to the next are done so that it sounds like it's going up, when it actually goes down. The notes are the bottom row of the tonality diamond to the 11 limit.

The rhythm is based on dividing 30 beats into one of two general ways: either 5 6-beat quarter notes or 7 4-beat quarter notes and a 2 beat eighth note, with the latter quarter notes slower than the former. $5 * 6 = 30$ and $7 * 4 + 2 = 30$. It's kind of like a 3 against 4, except the 3 has a 5:4 feel to it, and the 4 has a lopsided samba feel.

6 - Slow Dance

This piece is made up of two chords, each of which is made up of the six notes of the otonality drifting up or down to other six notes. In this case, I start with a chord of the overtone series 4:5:6:7:9:11 and slide it up and down simultaneously to the same notes. 4 goes to 9 or 7, 7 goes to 4 or 6. Each note glides to its nearest overtone, up or down. There's a finger piano arpeggio that just moves up and down a 53-TET interval while playing on the 4:5:6:7:9:11 notes. They start in synch, drift out and back twice in two minutes. The piece is scored for finger piano, tuba, trombone, flute, French horn and realized in Csound.



My composition takes advantage of a great deal of indeterminacy to arrive at the final result. This has the added bonus of making it very easy to create another realization that has a different set of melodies and durations, but the same basic feel. The rest of the CD is made up of second takes of the same process that created the first ones. In fact I usually create at least 8 takes and save the best two for posterity.

7 - Walking Down the Blue Glacier - take two

8 - At the Terminus of the Blue - take two

9 - The Rocks of Glacier Creek - take two

10- Elk Lake Dancing - take two

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