BOLDER Sounds

Presents

HARMONIUMS
of the
OPERA

for the Apple EXS24

Introduction

The harmonium is a keyboard instrument in which air is blown through a set of reeds, the air is typically supplied by bellows operated by the foot, hand, knees, or in the case of some of the 20th century harmoniums an electric blower. This sample library features two rare and contrasting harmoniums -

one foot pumped harmonium made in the 1840s owned by the Julliard School, and an electric harmonium owned by the Metropolitan Opera.

The Harmonium is an instrument that is employed in classical, folk, devotional and popular music. The title "Harmoniums of the Opera" is a bit "tongue-in-cheek", but is also related to the story behind this sample library which is briefly summarized below.

Background on this Sample Library

A sample library of a Bharat 3-1/2 octave harmonium was added to the Bolder Sounds catalogue in July of 2009. To my surprise, it has been one of the most popular libraries we offer. A number of well known organizations and high profile musicians have been using it.

In January of 2010 I received a call from Rob Gorton - chief sound engineer from the Sound Department at the Metropolitan Opera in New York City. The MET had just purchased a copy of the Bharat harmonium for use in the Richard Strauss opera *Ariadne*. The MET needed the range of the sampled harmonium extended to accommodate the score, also a KONTAKT programming error needed to be corrected (which very inconveniently played the wrong pitch during a rehearsal). Rob told me the MET owned an old German electric 5 octave harmonium which was no longer suitable for live performance. It's notes were very soft and the blower which sent the air over the reeds was very loud (not an ideal combination). Also there was approximately a .5 second delay from the key being pressed until the note was actually heard. We discussed the possibility of myself coming to NYC sometime in the future and creating a virtual restoration/recreation of this instrument.

In July of 2010 I received a call from Christopher Ruigomez - (Director of Concert Operations Boston Symphony Orchestra) from Tanglewood about the possibility of doing a quick sampling of the BSO's historic harmonium for a performance by the Boston Lyric Opera. Due to complications and time constraints that was not possible. Chris later referred me to Joanna Treblehorn (Director of Orchestral and Ensemble Operations) at the Julliard School in NYC, where I had heard they owned one of the best sounding harmoniums on the east coast - and indeed, it was a beautiful sounding instrument that was recently restored. I was generously permitted to record it.

The sampling sessions of these two instruments took place on June 10th of 2011 at the Metropolitan Opera and on June 13th at the Julliard School at Lincoln Center in New York City.
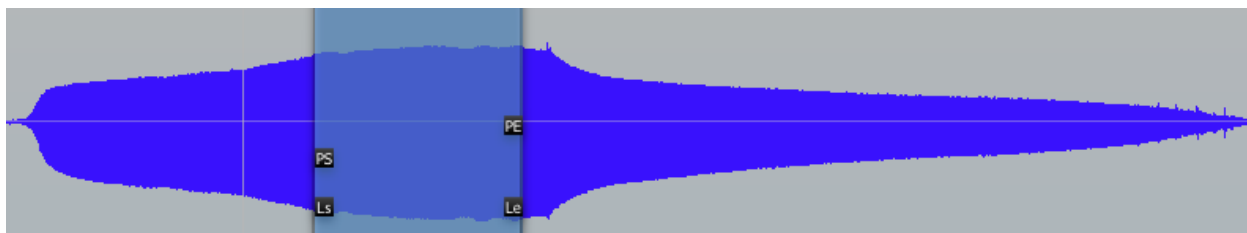
The Julliard
Harmonium

The Julliard harmonium was made in the 1840s. It is a foot pumped instrument and the bellows are the original leather. It is a five octave instrument with one stop only (in the EXS version we have created an artificial octave couplet). It has a wonderful organic breathing accordion-like quality. This harmonium has 2 pedals - one to pump the bellows and a second pedal that acts as a *breath pedal* which allows you to pull the bellows apart without making an audible musical note (similar to accordions). In the sampling of the Julliard instrument it was not necessary to use the breath pedal.

I sampled all of the keys chromatically. First I recorded long notes with a continuous up and down pedal stroke. Then I recorded just one long downward pedal stroke. By the end of the 6 hour sampling session, I had to use both my arms to move my leg up and down in order to pump this instrument - it was quite a workout!

The samples that were finally used in this library were the *one long downward pedal stroke* samples. Only a small section of those samples were used as the final .wav files. This is why the Julliard harmonium is quite compact. Some might consider it to be small by today's sampling standards. I will explain the reason for these smaller sized samples below. However, I am very confident that when you begin playing this sampled harmonium you will forget entirely that it is just 20 MB in size. Size does not necessarily reflect quality- it is an extremely expressive harmonium sample.

When pumping the harmonium, there is a natural volume swell and decay. But even more important, there is a swell and decay in the EQ characteristics which gives the player control over the "rhythmic breathing" quality that makes the instrument sound so human.

My intention with the *long downward stroke pedal* samples was to get a very even sound for as long as possible, and to make fairly sizable samples with loops- perhaps 5 or 6 seconds in length. However, this was not the result. There was always a tonal change from dark to bright which took place within a minimum of 3 to 4 seconds and on higher notes even more quickly. If I chose to use the long samples with the tonal (EQ) present, then the user would really have no way of controlling the *speed* at which those tonal/volume changes occur. Also, since samples are triggered at different points in time, there would be no way to synchronize the *breathing tonal effect*. When playing a virtual instrument, control is the key to expressiveness.

As you can see in the above waveform, the loop is placed where the volume is at a fairly even peak and the EQ spectrum is at its brightest as well.

The solution was simply to find a stable part of the waveform which had a bright character and to use only that portion. The brighter portion of the waveform was chosen because most listeners find subtractive EQ more pleasing than additive EQ. By programming various control parameters within the EXS, we emulated the breathing effect with the use of LFOs, amplitude and filter modulation. Also the subtle use of an LFO is employed to give the samples a bit of motion to keep the sound from being too static.

Installing EXS instruments

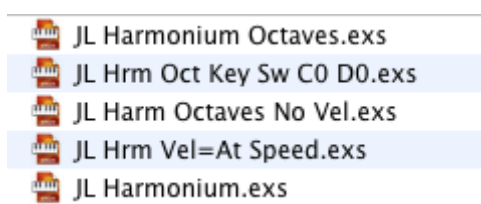*Before you do anything else - please make a backup copy of the package you have downloaded onto DVD media!*

** The download is a 2 part .rar file - once both parts are downloaded, open part 1 **only** and part 2 will self-extract. Do not open part 2 at all.*

The Harmoniums_of_the_Opera .rar file needs to be decompressed, there are many utilities on the internet which will do this on OS X. Some are freeware and some are not. The one that I use on OS X is called RAR Expander.

After extracting the Harmoniums of the Opera folder, you may place it anywhere on you hard drive you like. However there two folders - *Juilliard Harmonium instruments* and *MET Harmonium instruments* which must be placed in the correct place as follows -

Copy these to **Sampler Instruments folder** used by Logic to (user/Library/ Application Support/Logic/Sampler Instruments).

The Juilliard EXS Instruments

Picture above are the .exs instruments in the ***Juilliard Harmonium** **folder.**

JL Harmonium Octaves.exs – this exs instrument offers a octave couplet setting which was not available on the original instrument. It was created by remapping one of the groups down an octave and stretching the top octave.

JL Hrm Oct Key Sw C0 D0.exs – This is a key switched instrument toggling between the octave couplet and the single pitch harmonium. Simply press C0 to hear the single pitch mapping and D0 to use the octave mapping. This is very useful for realtime playing as well as sequencing in a DAW.

JL Harm Octaves No Vel.exs – This is the octave mapping presenting the harmonium with no velocity response (just a tiny bit really). This is how the Juilliard instrument actually worked. Dynamics are created with the pump pedals.

JL Hrm Vel=At Speed.exs – When playing a lower velocity levels, there is a slower attack on the Amplitude Envelope. As you increase velocity, the attack speeds up, making faster passages more articulate and clear. However the

volume does NOT change according to your velocity level. This is simply intended as a means to control the attack speed in real time for expressive purposes.

JL Harmonium.exs – This is the Juilliard instrument as a single stop with velocity response enabled. You could think of this as the *default* instrument.

Notice above in the EXS matrix window that Ctrl #1 (CC#1) the mod wheel is controlling both the filter cutoff as well as the relative volume. If you wish to control these 2 parameters with an expression pedal (so both hands are free), this is very easy to change – see below.
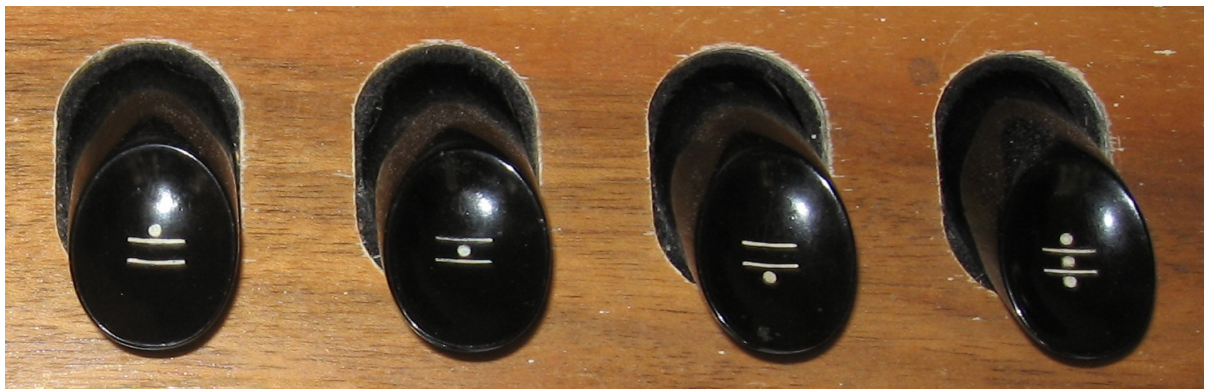

Simply click on the green Ctrl#1 in the matrix for the Rel. Volume and a drop down menu will appear. As you can see above – just select Ctrl #11 (Expression Pedal) as the Src (source). The do the same thing for the Filter Cutoff as well. Be sure to save the instrument afterwards. Of course you can choose any controller in the list as well.

* An expression pedal will be more expressive due to the fact that it not only changes the volume of the harmonium but it also controls a LoPass filter as well. A simple volume pedal will not do this.

About
The Metropolitan Opera
Electric Harmonium

The electric harmonium owned by the Metropolitan Opera is a 5 octave instrument starting on the pitch of C. It's actual range depends on which stops are engaged. There are seven possible stop combinations triggered by seven separate stop buttons. These stop buttons look like something from a automobile radio made in the 1950s to change stations. There are actually 3 solo stop selections - stop 1, 2 and 3. the other buttons represent combinations of the three stops (see 4 of the 7 buttons below).
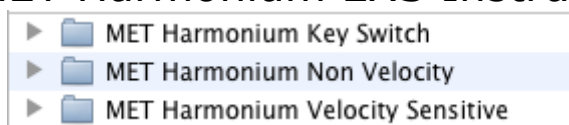
A number of the stops had notes in the upper range that had a severe volume drop or did not sound at all. We have evened out the volume of individual stops to a *restored* state. And from there, layered the 3 stops in the various combinations that the original instrument offered. The result is a very full sound which is most likely very close to the sound of this instrument when it was manufactured.

This harmonium uses a blower to send air over the reeds, it is not a foot pumped harmonium. The blower creates a very even air flow and therefore the sound of a note does not have a tonal "swell" to it, the sound is very uniform and even much like an organ. The blower was extremely noisy. The blower sound was removed from each sample with noise reduction software.

Since the MET harmonium sound is quite even, I chose to use samples that are quite long. The samples then have a relatively short loop placed towards the end of the sample. Upon a note-on, most users playing traditional music will never even get to the portion of the sample that is looped. A high percentage of the loops are usually placed past the 10 second point.

The MET Harmonium EXS Instruments

▶ 📁 MET Harmonium Key Switch
▶ 📁 MET Harmonium Non Velocity
▶ 📁 MET Harmonium Velocity Sensitive

Above you see the folder structure of the MET harmonium EXS instruments.

MET Harmonium Key Switch folder – contains two key switched instruments, one is velocity sensitive and one is not. The key switches are assigned from C-1 to B-1. The key switch assignments are as follows -

C–1 – Stop 1
D-2 – Stop 2
E-2 – Stop 3
F-2 – Stop 1 and 2
G-2 – Stop 3 and 2
A-2 – Stop 3 and 1
B-2 – Stop 3, 2 and 1

The MET Harmonium Non Velocity and MET Harmonium Velocity Sensitive folders have the same seven EXS instruments inside them. The only difference being that one folders instruments are velocity sensitive while the other folders instruments ignore velocity data.

The .exs instruments are clearly labeled with all possible 7 combinations of stops.

If you wish to assign a expression pedal to control volume (instead of your modulation wheel – please see instructions on page 6 of this manual.

My sincere appreciation to the following people for their help on this project-

Rob Gorton at the Metropolitan Opera / Joanna Treblehorn at the Julliard School / Christopher Ruigomez at the Boston Symphony Orchestra

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Enjoy The Julliard Harmonium library!

Dennis Burns - Bolder Sounds - February 2012
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Customer Support
For any questions, technical issues inquiries etc .... Please contact Bolder Sounds via email at sales@boldersounds.net.

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