

## Table of Contents

License agreement & copyright information:.....	3
Introducing NDK:.....	4
Pre-processing and 2-bus compression:.....	4
The most extensively sampled acoustic instrument, ever!.....	4
Featured instruments:.....	5
Thanks to:.....	5
Nomenclature:.....	6
Abbreviations explained:.....	6
File names explained:.....	8
For drums:.....	8
For cymbals:.....	9
For hi-hats:.....	9
For kick-drum:.....	10
Pre-roll:.....	10
Alternate samples of the same articulation:.....	11
Miss-hits:.....	11
Pre and release samples (brush snares only):.....	11
_misc:.....	12
Air swipes:.....	12
Folder hierarchy:.....	12
Installing the samples:.....	12
Kit set-up diagrams:.....	13
Samplers:.....	15
Why HALion and Kontakt?:.....	15
HALion Player:.....	15
Nomenclature:.....	15
Loading HALion presets:.....	15
About the FXPs:.....	15
About the FXBs:.....	16
Pre-load:.....	16
MIDI channel numbers:.....	16
Audio channels:.....	16

FXP volume:.....	16
“Random robin” and associated mapping differences:.....	16
How to play the kits:.....	16
Universal key mapping:.....	16
modulation wheel:.....	17
Hi-hats:.....	17
Voice groups & polyphony:.....	19
A few final words:.....	19
APPENDIX 1: instrument specifications.....	20
Snares (5359 unique samples) :.....	20
Kick-drums (668 unique samples) :.....	22
Hi-hats (4204 unique samples) :.....	23
Cymbals (1858 unique samples) :.....	23
Toms (5894 unique samples) :.....	26
Percussion (253 unique samples) :.....	27
APPENDIX 2: articulation charts.....	28
Snares:.....	28
Kick-drums:.....	29
Hi-hats:.....	29
Cymbals:.....	30
Toms:.....	31
Percussion:.....	32
APPENDIX 3: hi-hat openness charts for HALion mappings.....	33
hh13, sticks:.....	33
hh13, mallets and brushes:.....	33
hh13, hands:.....	33
hh14, sticks:.....	34
hh14, mallets and brushes:.....	34
hh13, hands:.....	34
APPENDIX 4: sample-count breakdown.....	35
APPENDIX 5: universal mapping chart.....	36

**License agreement & copyright information:**

IMPORTANT - READ CAREFULLY: This Atelier Robin End-User License Agreement ("EULA") is a legal agreement between you (either an individual or a single entity) and Atelier Robin for the NDK Sample Library you have licensed.

"NDK Sample Library" refers to the entire contents of the NDK DVDs and that which is made available to the end-user through the members resource section of the naturaldrum.com website – <http://naturaldrum.com>.

Copyright laws and international copyright treaties, as well as other intellectual property laws and treaties protect NDK Sample Library (hereafter referred to as "the Library") and it is licensed, not sold. The rights granted here are validated by proof of purchase from Atelier Robin, or from a dealer/distributor authorised by Atelier Robin. All rights not expressly granted to Licensee are reserved by Atelier Robin or its licensors. The Library remains the property of Atelier Robin.

1. GRANT OF LICENSE. In consideration of payment of the license fee, which is a portion of the price you paid, Atelier Robin ("Licensor") grants to you ("Licensee") through this EULA the limited, lifetime, non-exclusive world wide right to use the sounds that make up the Library in the creation of a recorded or live performance that includes the licensed samples as part of a derivative musical work created by the licensed end-user.

2. COPYRIGHT ©2008. All rights, title, and copyrights in and to the Library (including, but not limited to, any images, photographs, video, audio, music and text incorporated into or associated with the Library) and any copies of the Library are owned by Atelier Robin unless otherwise noted. Copyright laws and international treaty provisions protect the Library. Therefore, you must treat the Library like any other copyrighted material, except that you may make copies as only provided in this EULA. You may not copy the printed materials accompanying the Library.

**3. RESTRICTIONS ON USE.**

(a) In addition to the terms laid out in Section 1 above and in the Paragraph 5 (b) below, you may not do the following: (i) electronically transfer the Library, or make the Library available, to multiple computers over a network system; (ii) distribute copies of the Library or accompanying materials to others; (iii) embed the Library samples in any hardware as a stand alone element without an additional license from Atelier Robin.

(b) The Library samples may not be included, whether unmodified or as part of a derivative work, in any music library or sample library product. Any unlicensed usage will be prosecuted to the maximum extent possible under the law.

(c) You may claim copyright on a derivative musical work created by the licensed end-user (as outlined in section 1 above); however, one or more samples from the Library may not be mixed solely with one or more samples from the Library or third party sound effects to create a derivative sound effect on which you claim a separate copyright (i.e. you cannot make new samples using our samples as building blocks and then exploit them as a part of a third party sound effects library, compilation, or otherwise).

(d) Sampler presets or similar (including, but not limited to, presets for sound replacement plug-ins, sequencers, virtual instruments etc.) designed to be used with the Library samples may not be sold without express permission from Atelier Robin.

4. TRANSFER RESTRICTIONS. You shall not assign, rent, lease, sell, sub-license, or otherwise transfer the Library to another party without prior written consent of Atelier Robin. Any party authorised by Atelier Robin to receive the

samples must agree to be bound by the terms and conditions of this Agreement.

5. **TERMINATION.** Without prejudice to any other rights, Atelier Robin may terminate this EULA if you fail to comply with the terms and conditions of this EULA. In such event, you must destroy all copies of the samples and all of its component parts.

## **Introducing NDK :**

The guiding principles behind every NDK design decision were:

1. The user should be able to play NDK live as a full drum kit.
2. If it's possible to play something on a real drum kit, it should be possible to play on NDK.
3. NDK should sound utterly convincing and the end-user should feel they actually own the source instruments.
4. It should be usable "straight from the box".
5. NDK should represent extreme value for money.

Further to the above, a concept that has been at the core of NDK since its inception: the user should forget that he or she is triggering samples and feel like they are playing a real instrument. This is achieved through close attention to detail, a thorough knowledge of the instrument being replicated and incisive sampler mapping.

Consider this: the NDK 13" hi-hat contains over 3500 individual hits and the stereo bounce down of these samples weighs in at a massive 4.43GB. If we went for the multiple-mic option, you could end up with well over 20,000 samples taking up over 20GB; just for the hi-hats!

With NDK, the ability to play sampled instruments live has always been the order of the day. All the drums and cymbals in NDK were recorded as a full kit through multiple microphones. Then we have done the hard work, pre-mixed and bounced them down to stereo files for the final library. For NDK, the emphasis was put on providing many extra articulations or velocity layers. We believe this makes for a more expressive kit and one which is eminently more playable.

### **Pre-processing and 2-bus compression:**

As mentioned earlier, the files in this library have been pre-mixed. Additionally, they have been pre-processed according to style. For example, the rock kit has some audible compression, whereas the pop kit has only light compression and subtle EQ sweetening. Again, this helps provide you with a kit that sounds good straight from the box.

Importantly – 2-bus compression/limiters/maximisers haven't been used – in other words, no dynamic processing was used across the master outs. 2-bus compression can be an important part of getting a cohesive drum sound, but it works most effectively when applied to a complete drum track, rather than individual samples. This allows you to choose attack/release times, threshold and ratios appropriate to the particular project at hand.

### **The most extensively sampled acoustic instrument, ever!**

As far as we are aware, NDK is the most extensively sampled acoustic instrument ever made. To clarify: many of our single kits (6 piece shell pack, snare, hi-hat and cymbals) have more individual hits, as a direct by-product of the sheer number of articulations and velocity layers, than any other sampled acoustic instrument currently on the market.

**Featured instruments:**

A detailed list of all the drums and cymbals sampled can be found in Appendix 1, but there are three instruments we feel warrant a more detailed examination:

- hh13 (a.k.a. “dreamhats”) – UFIP 13” “Bionic Series” hi-hats.

*A first for sampled drum-kits: a set of hi-hats which mirror the expressive qualities of the real thing.*

In reality, these hi-hats are most versatile and dynamically unsurpassed. When we were going through the planning stages of ns\_kit, we wanted to do that sound justice and knew that the hi-hats were going to be very extensive. We wanted to be able to do everything on the NDK hi-hats that you could do on real hi-hats. That dream has become a reality – hence, dreamhats!

Not only are you presented with top, edge and bell hits, you also get 16 degrees of “openness”; the first 13 degrees of which have left and right hand samples for ordinary and top hits! Add to that pedal “chicks”, splashes and grabs (all with varying degrees of “openness”), rim hits, brushes and mallets (though these “only” have 6 degrees of “openness”.) and you can see why the 13” hi-hats weigh in at almost 4.5GB.

- sn12 – Pearl Masters “All Maple” 12x7 snare.

*Something of a landmark in sampled snare-drums, containing over 3400 samples.*

While many drum libraries present the end-user with multiple snares, there are rarely different tunings of the same drum. We have taken issue with that and provided you with no less than five different tunings – one of which is available in muted and open variations.

We feel that 12 inch snares generally record better than 14s, giving tighter imaging and greater clarity, which is why we chose it as the NDK master snare. The risk with 12 inch snares is that the added focus is at the expense of a full sound; not so with this particular snare. Partly what makes the Pearl 12x7 so versatile is it's unusually deep shell, allowing it to support different tunings with ease.

- cy19ride – UFIP 19” “Experience Series” thin vintage ride.

*If there's one area that's always been lacking in sampled drum libraries, it's the ride cymbal. Until now...*

Consider that for many styles, particularly jazz, the ride cymbal is as important (if not more important) than any other part of the kit. From the quietest accents to thundering crashes, there is little to compete with the variation of tone that can be extruded from a ride and this 19” UFIP is no exception.

To achieve this high degree of expression, we recorded 49 velocity layers on the ordinary hits, 26 on the bell, 29 “elvin-shots”,<sup>1</sup> 14 rim hits and 46 hit and grabs. This cymbal also sounds really nice when you crash it, so we recorded 36 velocity layers of that too!

But it doesn't stop there – you also get a similarly extensive set of samples for brush, mallets and hand hits. And then there's the sizzle ride, but we think we've said enough...

**Thanks to:**

Douglas Whates from naturalstudio.co.uk for creating the precursor to NDK, the ns\_kit7 drum samples library, all samples in NDK and ND Congas originate from ns\_kit7.

Jamie Flanagan for providing a killer set of drums, cymbals and percussion and not least for performing all the NDK

<sup>1</sup> See appendix 2 For articulation descriptions

(ns\_kit7) samples!

Everyone who made NDK free presets.

## Nomenclature:

Please take a few moments to familiarise yourself with the following information – it is fundamental to the understanding of NDK. A solid grasp of the naming conventions and abbreviations used will enable you to decipher the file name of any NDK sample with ease.

### Abbreviations explained:

bel = bell brs = brushes cls = closed crs = crash cy = cymbal e2c = edge to center elv = "elvin-shot" grb = hit & grab grc/grt = crash/top hit & grab hnd = hands hh = hi-hat kd = kick-drum l = left hand m = muted	mlt = mallets opn = open ord = ordinary hit p = pre-roll or pre-sample ped = pedal/chick pn = percussion prs = press hit r = release sample r = right hand rim = rim rmh = high rim-shot rms = rim-shot rol = roll shl = shell	slp = slap spl = splash stn = stand stx = sticks swc = circular sweep swl = legato sweep sws = staccato sweep swu = under -sweep t2l = tight to loose tm = tom top = top w = snare (wire) on x = miss-hit xtk = cross-stick
---	---	--

While most of the terms above are self explanatory, the table below may help with the more obscure terminology.



**Ordinary hit:**  
(snare & toms):  
Applies to all snares and toms.



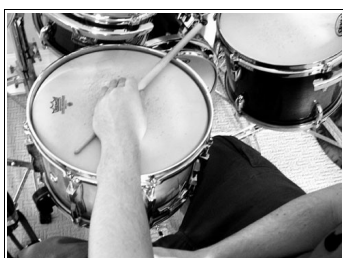
**Edge to centre:**  
progresses from the edge of the skin to the centre as the hits become louder.



**Rim-shot:**  
stick makes contact with the skin and rim at the same time.



**High rim-shot:**  
featured on some of the snares.



**Cross-stick:**  
the drummer rests one end of the stick on the skin and strikes the rim with the other.



**Cross-stick, "stick shot":**  
tip of left stick rests on skin, right hand strikes stick.



**Rim:**  
stick shaft hits the rim of the drum.



**Ordinary hit (hi-hats):**  
stick shaft hits the top hi-hat at the edge.



**Top (hi-hats):**  
stick tip hits the top of the hi-hat.



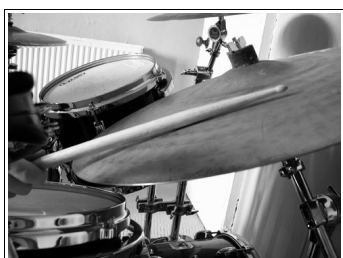
**Bell (hi-hats):**  
stick shaft hits the bell of the hi-hat.



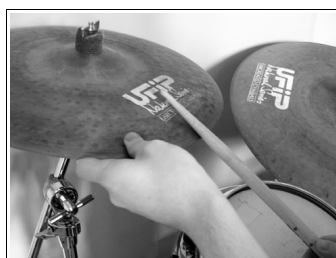
**Ordinary hit (crashes & splashes):**  
shaft of the stick hits cymbal very near the edge.



**Ordinary hit (rides):**  
tip of the stick hits top of the cymbal (same for crash & splash top hits)



**Elvin-shot (rides):**  
shaft of the stick hits the top of the cymbal.



**Hit & grab (cymbals):**  
the cymbal is first hit and then quickly grabbed (choked).





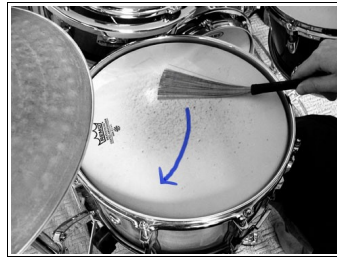
**Rim**  
(cymbals):  
the shaft of the  
stick hits the  
cymbal rim.



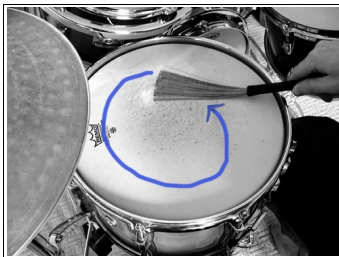
**Bell**  
(cymbals):  
For quiet hits,  
the stick tip is  
used; for  
louder hits, the  
shaft of stick is  
used.



**Closed brush**  
**hits:**  
The brush is left  
in contact with  
the skin after  
hit. Open hits  
allow the brush  
to rebound.



**Staccato and**  
**legato sweep**  
(snare):  
The brush is  
swept across  
the snare skin.



**Circular-sweep:**  
The brush is  
swirled in a  
continuous  
motion around  
the skin.



**Staccato sweep**  
(cymbals):  
The brush is  
swept across  
the surface of  
the cymbal.



**Closed**  
(kick drum):  
After the strike,  
the beater is left  
in contact with  
the skin.



**Open**  
(kick drum):  
After the strike,  
the beater is  
left to rebound  
from the skin.

### Filenames explained:

We have used the following templates for naming NDK files:

#### For drums:

[instrument type][drum size][snare on/off][style]\_[stick type][hand]\_[articulation]\_[sample number]



*example:*

```
sn14wrock_stxl_ord_021.wav (i.e. [sn][14][w][rock]_[stx][l]_[ord]_[021])
= 14 inch rock snare, snare on, ordinary hit, using a stick in the left hand. Sample number 21.

tm10bop_brsr_rms_013.wav
= 10 inch bop tom, snare off, rimshot, using a brush in the right hand. Sample number 13.
```

As you can see; “snare on” is signified by a “w”, whereas “Snare off” omits the “w”.<sup>2</sup>

In addition to the above, the bop snare adds a muted variation which is indicated by the letter “m” after the “style” parameter.

*example:*

```
sn12wbopm_mltr_ord_017.wav
= 12 inch bop snare, snare on, muted, ordinary hit, using a mallet in the right hand. Sample number 17.
```

#### **For cymbals:**

The template used for cymbals is very similar to the above, but there is no need for “snare on/off”, “hand” or “style”. So:

```
[instrument type][cymbal size][type]_[stick type]_[articulation]_[sample number]
```

*example:*

```
cy12splash_stx_bel_006.wav
= 12 inch splash, on the bell, using a stick. Sample number 6.

cy18crash_brs_grb_012.wav
= 18 inch crash, hit & grab, using a brush. Sample number 12.
```

#### **For hi-hats:**

The template used for hi-hats is very similar to that used for cymbals, but removes “style” and adds “hand” and “open-ness” parameters. So:

```
[instrument type][hi-hat size]_[stick type][hand]_[open-ness][articulation]_[sample number]
```

*example:*

```
hh13_stxr_ctop_025.wav
= 13 inch hi-hats, hit on the top, using a stick in the right hand, “c” open-ness. Sample number 25.

hh13_stx_mped_033.wav
= 13 inch hi-hats, pedal, “m” open-ness. Sample number 33.
```

It is worth pointing out here that hi-hat openness is graded alphabetically, with “a” being the most closed. However, with regards to the 13 inch hi-hats, the same letters between different sticks don’t relate to the same degree of openness. That is to say that an openness of “d” with sticks on the hi-hats isn’t the same as an openness of “d” with mallets. This is due to the fact that there are 16 degrees of openness with sticks on the hi-hats (i.e. a – p) and 6 with mallets (i.e. a –

<sup>2</sup> The dead toms (tmdead), funk snare (sn12funk), dead snare (sn12dead), tight snare (sn12tight), piccolo snare (sn12piccolo), no reso’ kick (kd22noreso) and full kick (kd20full) were only recorded with snare on. Despite that, these samples omit the “w” from the file name.

f).

**For kick-drum:**

The template used for kick-drum is very similar to that used for snare, but removes “hand” and “stick type”. So:

```
[instrument type][drum size][snare on/off][style/type]_[articulation]_[sample number]
```

*example:*

```
kd20wpunch_cls_031.wav
```

```
= 20 inch kick drum, snare on, closed hit. Sample number 31.
```

**Pre-roll:**

If you've ever scrutinised a kick drum recording, you'll notice that, preceding the drum's main attack, there is a significant amount of noise caused by the kick-drum pedal – this is particularly evident for the louder hits.<sup>3</sup> While in a normal recording this wouldn't be a problem, when editing samples it represents something of a quandary – where do you crop the file? we found that cropping from the first sign of pedal noise resulted in a sample that was very difficult to trigger with any timing accuracy. The reason for this is quite simple: when a drummer plays a real kit, they are subconsciously accounting for the delay between applying pressure to the pedal and the beater hitting the skin. This can't be done on a MIDI instrument as the first it “knows” what you want is after the event (note-on). Therefore, when triggering kick-drum samples via a MIDI controller, the MIDI note-on should trigger the sample starting from the main attack of the drum; not the preceding pedal noise.

However, this results in a sound which, to the discerning ear, seems slightly cropped and un-natural; whereas, the un-cropped file sounds fuller and more natural. So, where necessary, we have presented you with two different versions of the same samples – one cropped and one with a certain amount of “pre-roll” to capture the pedal noise. The pre-roll samples are available to download from the member's resource area of the naturaldrum.com website and can also be found on the DVDs. Here's how to use those files:

For live triggering, playing back existing MIDI files, general sequencing, drum machines/step sequencers, etc. use the normal, cropped samples.

Where you have the option to manually edit your MIDI notes, use the “pre-roll” samples. Then, select all your kick-drum hits and move them earlier by the relevant amount, as indicated in the file name (see below). In essence, what you are doing in this final step is anticipating the attack of the kick-drum, in much the same way a real drummer would on a real kit.

Pre-roll samples are indicated in the file name by the letter “p”, followed by the amount of pre-roll in milliseconds. So:

```
[instrument type][drum size][snare on/off][style]_[pre-roll]_[articulation]_[sample number]
```

*example:*

```
kd20wpunch_p50_cls_031.wav
```

```
= 20 inch kick drum, snare on, closed hit. 50ms pre-roll. Sample number 31.
```

<sup>3</sup> A particularly good example of this sound can be heard in James Brown's “Get Up, I Feel Like Being a Sex Machine” where the listener can clearly hear the pedal noise, squeaks and all!

To reiterate: “kd20wpunch\_cls\_031.wav” and “kd20wpunch\_p50\_cls\_031.wav” are exactly the same, except the latter has a 50ms pre-roll.

This same phenomena also appears in hi-hat pedal (and splash) and snare cross-stick samples (this time, rather than pedal noise, it is the hand and stick moving against the snare skin that the listener hears before the main attack). For both the above we have provided alternative pre-roll versions of the samples and named them in a similar fashion to the kick drum samples.

**Alternate samples of the same articulation:**

Occasionally there are alternative samples of the same articulation. This is indicated by a letter in front of the sample number.

*example:*

```
tm14rock_stxl_ord_a013.wav
= 14 inch rock tom, snare off, ordinary hit, using a stick in the left hand. Sample number 13, set a.

tm14rock_stxl_ord_b013.wav
= 14 inch rock tom, snare off, ordinary hit, using a stick in the left hand. Sample number 13, set b.
```

**Miss-hits:**

Included in this library are rim-shot miss-hits. Miss-hits are indicated with the letter “x”, which is appended to the file-name accordingly.

*example:*

```
sn12funk_stxl_rms_002x.wav
= 12 inch snare, rim-shot miss-hit, using a stick in the left hand. Sample number 2, miss-hit.
```

**Pre and release samples (brush snares only):**

Certain brush snare articulations have associated pre and release samples, indicated in the file name by the letters “p” and “r” respectively.

First, let's deal with the release or “lift-off” samples: When a drummer plays a closed brush hit, the brush is left on the drum skin. Lifting the brush from the skin makes a noise. we have provided these “lift-off” noises as separate samples, indicated by the letter “r” after the associated sample number.

*example:*

```
sn12wbop_brsl_cls_033r.wav
= 12 inch bop snare, snare on, closed brush hit release (“lift-off”) sample. Associated with sample number 33.
```

Next, let's deal with the “pre” samples: These differ slightly from pre-roll, though they are similar in concept. When a drummer plays a snare sweep with a brush, the brush must first make contact with the skin. We have provided these contact noises as separate samples, indicated by the letter “p” after the associated sample number.

*example:*

```
sn12wbop_brs_sws_013p.wav
= 12 inch bop snare, snare on, staccato sweep contact noise, using a brush. Associated with sample number 13.
```

## **\_misc:**

The NDK sample library contains a “\_misc” folder in which you will find an assortment of samples that defied categorisation.

The silent sample is 2ms of silence, and is used as as part of a workaround for implementing mute groups in certain HALion 3 mappings (see the HALion section later in the manual for more details). Hi-hat stand, snare mechanism, stick “count-ins” and silence are all self explanatory. The “air swipe” samples require a bit more explanation...

### **Air swipes:**

As an added bonus, we have included “air swipe” samples. The reasoning behind the inclusion of these samples is related to that of the kick pre-roll sample: in a real recording, preceding the main attack of louder hits (be that with sticks, brushes or mallets), the discernible listener will notice a definite pre-attack sound; further investigation reveals it to be the sound of the particular stick/mallet/brush swiping through the air.

As touched upon earlier, cropping samples from this pre-attack would result in a sample which triggers in a very unnatural fashion. As such, we have cropped the samples from the main attack of the sound, but provided you with air swipe samples which can be added later.

While the stick and mallet samples are, admittedly, something of a gimmick, we find that a great deal of what defines the brush sound comes from these air swipes – there is no doubt that correctly implementing them will improve realism greatly. The method for doing this is similar to that outlined in the pre-roll section.

## **Folder hierarchy:**

Folders are also named using the templates described above and, without exception, are nested as follows:

```
drum/cymbal name
↳ stick type
  ↳ openness (hi-hat only)
    ↳ muted/open (bop snare only)
      ↳ snare on/off
        ↳ articulation
```

## **Installing the samples:**

MS-Windows: Run the setup.exe program present on each of the 2 DVDs.

MAC OSX: Run the setup program present on each of the 2 DVDs

When prompted by the setup program, select the destination disk/folder for the samples. The sound files on the DVDs are compressed in FLAC lossless format. The setup program will decompress the FLAC sound files to wav format and store them in your destination folder. You need 19GB of free space on your hard disk to store all samples.

DVD content:

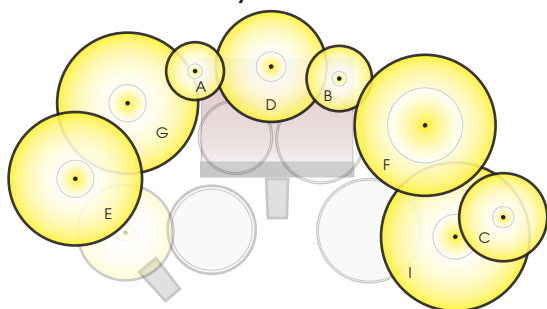
DVD1 – kicks, percussion, cymbals, hihats ,congas, this manual, misc. samples and an archive of current member's resource downloads.

DVD2 – snares, toms, presets

### **Kit set-up diagrams :**

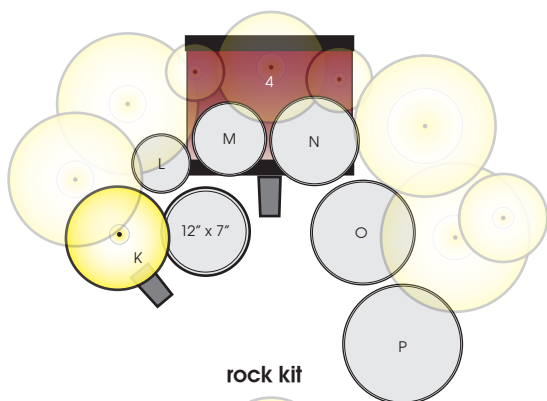
The drums and cymbals were recorded as complete kits and appear in the stereo field accordingly. The diagrams on the following page illustrates how the kits were set up during the recording:

**cymbals**



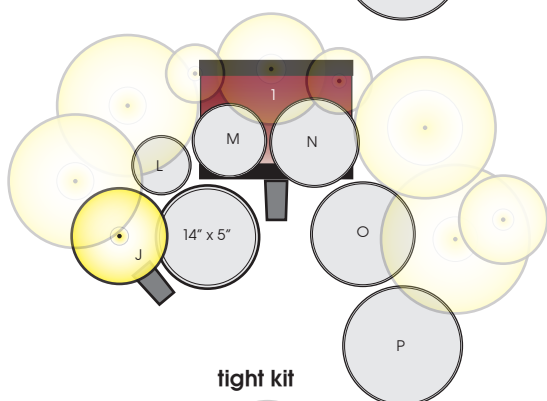
- A = 8" splash
- B = 9" splash
- C = 12" splash
- D = 15" crash
- E = 18" crash
- F = 19" china
- G = 19" ride

**orleans kit**



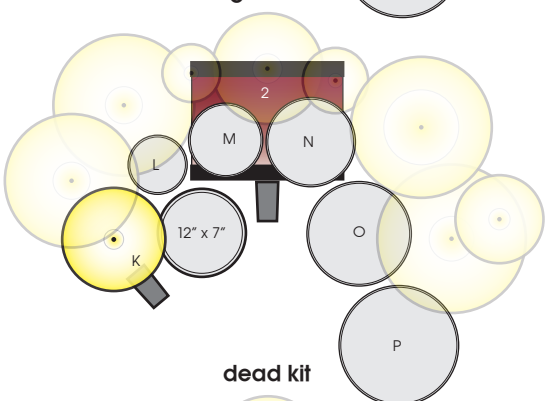
- H = 19" sizzle ride
- I = 20" ride

**rock kit**



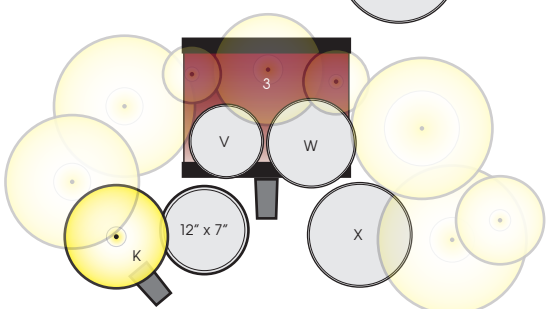
- J = 13" hi-hat
- K = 14" hi-hat
- L = 8" rock tom
- M = 10" rock tom
- N = 12" rock tom
- O = 14" rock tom
- P = 16" rock tom

**tight kit**



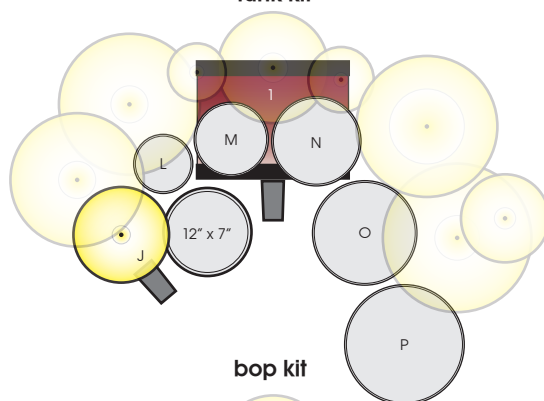
- Q = 8" bop tom
- R = 10" bop tom
- S = 12" bop tom
- T = 14" bop tom
- U = 16" bop tom

**dead kit**

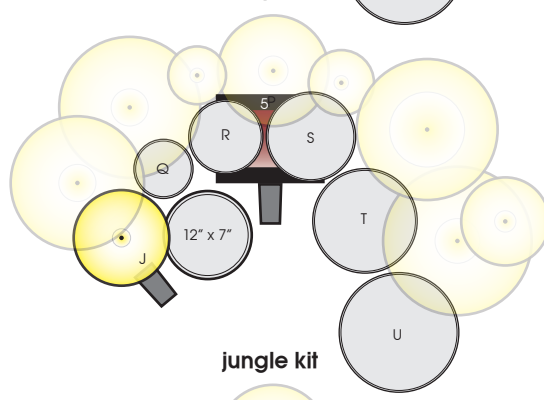


- V = 10" dead tom
- W = 12" dead tom
- X = 14" dead tom
- Y = 10" noreso tom
- Z = 12" noreso tom
- Zz = 14" noreso tom

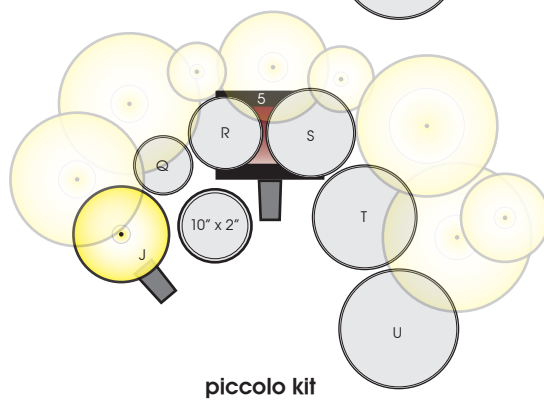
**funk kit**



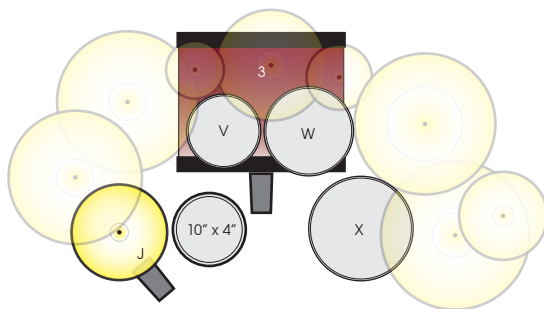
**bop kit**



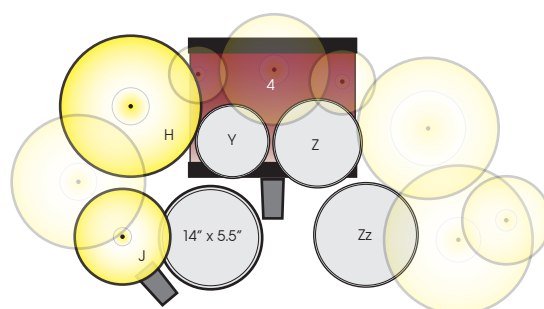
**jungle kit**



**piccolo kit**



**metal kit**



- 1 = 20" punch kick
- 2 = 20" full kick
- 3 = 22" noreso kick
- 4 = 22" boom kick
- 5 = 14" bop kick



## Samplers:

### Why HALion and Kontakt?:

As mentioned earlier, one of the most important aspects of NDK is the ability to play it live. Not only that, we wanted to allow the end-user to switch articulations on the fly, utilise multi-channel outputs, change volume and panning on individual drums, build their own kits and trigger convincing drum parts from e-drums. All that requires a sampler capable of triggering gigabytes of data at the push of a few buttons and, as such, disk-streaming technology is needed.

Also important is cross platform compatibility. We began looking at existing samplers and the necessity for disk-streaming and cross platform compatibility left us with very few options. In the end, both HALion 3.1 and Kontakt seemed ideal: they have a proven track record of reliable disk-streaming, good cross platform support, reasonable price, a comprehensive feature set and, most importantly, fills all the requirements we had planned for our library.

### HALion Player:

The icing on the cake is Steinberg's recent introduction of HALion Player. This is a stripped down version of HALion, but contains none of the playback restrictions often "featured" with developers' budget versions of their full-scale samplers. Put simply – if we have programmed a preset to work in the full version of HALion 3.1, we can be confident that anyone using HALion Player will benefit from said preset's parameters. Furthermore, like the full version, HALion Player allows the user to build and save their own kits, adjust panning, volume, audio outputs etc. Combined with HALion Player, NDK can be considered a very reasonably priced, supercharged virtual instrument which has the ability to run in standalone, VSTi, Dxi or AU format.

### Nomenclature:

The preset file names use a very similar naming structure to that described in the previous section, but with a few important additions:

**rr** = random robin. Essentially, this allows for more realistic triggering and is particularly aimed at e-drums users. More info on these presets can be found later in this section.

**monophonic** = where this is appended to the file name, the preset has a forced polyphony of 1.

**pedchk** = pedal choke. Appended to hi-hat presets where the pedal chick and splash cut off any sounding hi-hat notes. (including themselves).

**xf** = cross-fade. Again, hi-hat specific. Indicates that the hi-hat open-ness levels are faded into each other – can provide more realistic hi-hat response. More details later in this section.

### Loading HALion presets:

Loading NDK presets is no different to loading up any other HALion or Kontakt preset. Additionally, the various elements that make up NDK have all been mapped in such a way that you can easily create a custom kit by loading in the various kit parts without having to worry about different drums/cymbals being assigned to the same key.

### About the FXPs:

The HALion FXPs are for single drums and cymbals (as opposed to full kits) and will generally be used to compile custom kits. There are also FXPs for full sets of toms (shell packs) and cymbals (cymbal packs). All FXPs have their

volume set at HALion's default – this is 6db below unity.

### **About the FXBs:**

FXBs allow the library developer to create presets containing a number of different FXPs. It also allows the end user to save their custom kits and recall them at a later date. One advantage of FXBs is that it allows you to embed the following information in the save file:

#### **Pre-load:**

This is the amount of each sample within the bank that will be pre-loaded into ram. The higher the buffer, the less work the hard drive has to do. The lower the buffer, the more ram you need. All NDK presets have been set up with a .3s pre-load. This should be good for systems with 1GB of ram or more.

#### **MIDI channel numbers:**

It is possible to set up different MIDI channels for different parts of the kit. We have chosen to keep everything on the same MIDI channel – this aids live performance of the kit.

#### **Audio channels:**

We have set all kit parts to 1 stereo output. This allows for a quick and easy audition of the kit and means you don't have to use multiple audio channels in your sequencer. It is very simple to change the outputs if you wish.

#### **FXP volume:**

We have adjusted the volume on each kit part (i.e. FXPs within the FXB) to have a natural balance – that should be a good starting point. Of course, you may want to change this on a project by project basis.

#### **"Random robin" and associated mapping differences:**

When triggering from a keyboard, we would recommend using non-round robin patches and simply getting used to using left and right hand strokes, mod-wheel switching, using different articulations and making sure to make subtle variations in velocity (e.g. don't always hit velocity 127!). We have found that the control this gives, particularly for sequencing, is desirable. For e-drums, this method can be problematic as there is often only one pad to trigger one drum. To help overcome this problem, certain FXBs also have random robin variations. For those unfamiliar with this concept, it is a system which makes triggering the same sample consecutively nigh-on impossible. For these mappings, we have assigned left and right hand samples to the same key and set them to random robin. Certain snares also have edge to center hits – these have also been assigned to the same key and set to random robin. Kick drums random robin through the alternative closed and open hits.

In all instances, the mappings comply with those shown in 5, except the left hand samples have been pushed up a couple of octaves.

### **How to play the kits:**

#### **Universalkey mapping:**

All presets and banks within NDK use the same key mapping. This not only greatly aids the creation of custom kits, it means that once you've learned how to play and sequence one kit, you've pretty much learned them all.

As you'll see from the chart in Appendix 5, the NDK mappings aren't too far off General MIDI specifications, with the

following alterations:

- Hand clap (MIDI note #39) becomes snare rim-shot.
- Snare drum 2 (MIDI note #40) becomes snare press-hit.
- Low floor tom (#41) becomes ordinary hi-hat.
- Tambourine (#54) becomes 12" splash.
- Vibraslap (#58) becomes 9" splash.
- High bongo (#60) becomes 19" ride bell.

What makes NDK mapping unique is that the same mapping is also mirrored two octaves down, with the following exceptions:

- Right hand articulations swap to the left hand.
- Where available, snares have alternative cross-stick samples.
- Where available, kick drums have alternative samples of the same articulations.
- Crash and splash ordinary hits become top hits.
- Hi-hat pedal "chick" becomes pedal splash.
- Hi-hat open becomes hi-hat bell.
- 20" Ride ordinary hit becomes elvin-shot
- 19" Ride ordinary hit becomes crash hit and, for sticks, transposed down a semi-tone.
- Cowbell ordinary hit becomes top hit.

We have found this makes for an extremely playable kit which allows the performer to think and play like a drummer. If you're used to playing General MIDI drums from a keyboard, move your left hand down a couple of octaves and you'll be performing live takes in no time.

#### **modulation wheel:**

Further to the above, NDK uses extensive modulation wheel switching to access even more articulations. We have mapped the kits in such a way that you will be able to use all the kit parts on one MIDI channel and control them simultaneously with the mod-wheel – this is because we've set it up in phases. For example – if you push the mod wheel forward to hit a tom rim-shot, you'd still be able to play an ordinary cymbal hit. Keep pushing the mod-wheel, and only then will you get hit & grabs.

For live performance of NDK, it's highly recommended that you set up an expression pedal and assign it to CC#01. See Appendix 5 for the mapping chart which illustrates the various modulation controller phases.

#### **Hi-hats:**

As well as modulation wheel switching, the hi-hats also employ foot controller (CC#04) switching to control the degree of hi-hat openness. See Appendix 3 for hi-hat modulation and foot-switch mapping charts.

**foot controller (CC#04)** – to control openness of the hi-hats, you need to use some sort of MIDI continuous controller and assign it to CC#04. Typically, e-drums have their hi-hat foot pedal set up to send on continuous controller 4 by default. Also, many keyboards allow you to assign their modulation wheels (or data entry faders) to different continuous controllers. Alternatively, many sequencers allow you to draw in CC events – this will generally be a subsection of the piano roll screen.

**xf explained** – as mentioned earlier, certain presets have an “xf” appended to the file name. This stands for cross-fade and in principal it's a fairly simple concept, allowing the performer to use the foot controller (CC#04) to cross-fade between the different degrees of openness. For example: let's say I open the foot controller and hit a wide open hi-hat. If I then begin to close the foot controller, the wide open sample will begin to fade into a slightly less open hi-hat. If I close it some more, the wide open hi-hat sample will begin to fade out. If I keep closing the hi-hat, it will keep cross-fading down through all the samples.

There is a limitation, though, governed by the way this system is implemented. To comprehend this limitation, you need an understanding of how the cross-fade system works: triggering one hi-hat note with a particular velocity layer on a particular articulation and openness degree simultaneously triggers all samples assigned to that same velocity and articulation throughout the remaining openness degrees.<sup>4</sup> The cross-fade works by only letting you hear one openness degree which accords to your foot controller MIDI value. So, when you move the foot controller, it isn't triggering another sample, but cross-fading into one which is already there (triggered by the initial note on event). So, let's say I hit a completely closed hi-hat – the sound decays in under half a second. Yet, if I open the foot controller, I would cross-fade into the longer decaying open hi-hats. Clearly this is an unrealistic characteristic and should be considered when programming your hi-hats. Conversely, if I hit an open hi-hat and leave it too long before I close the pedal, the tighter hi-hats will have already decayed and you would be cross-fading into nothing. In practice, these scenarios come up very rarely. To reduce the frequency of such incidents, ensure that whenever you close the hi-hat, you also trigger a closed pedal sound – this will cut off any hi-hat samples ringing on.

---

<sup>4</sup> This also makes “xf” banks and presets very resource hungry as it has to stream a lot of samples simultaneously.

**Voice groups & polyphony:**

HALion demands that each instrument be assigned a group number which is given a polyphony limit. We have used the following setting for all NDK presets:

INSTRUMENT	VOICE GROUP	POLYPHONY
Kick drums:	1	4
Snare drum:	3	6
Toms	5	4
Percussion	6	4
Hi-hats	7	12
Hi-hats, cross-fade, stx	7	2*
Hi-hats, cross-fade, mlt, brs & hnd	7	3
Crashes & Splashes	9, 10, 11, 12, 13, 14	8
19" Ride	15	12
20" Ride	16	12

\* the three most tightly shut "openness" degrees of the the 13" hi-hats do not cross-fade and keep a polyphony of 12.

**A few final words:**

We hope you have found this manual informative and easy to understand.

If you decide to make your own presets using NDK samples and share them with others, we encourage you to use the mappings laid out in the universal mapping chart (Appendix 5). That way, potential users can download this manual and quickly see how the mapping and samples works. You can also share your mappings with other NDK users by posting them on the wiki or user forum on [naturaldrum.com](http://naturaldrum.com)

All feedback is much appreciated and if you have any questions, please don't hesitate to get in touch.

Good luck with your NDK projects!

<http://naturaldrum.com>

**APPENDIX 1: instrument specifications.****Snares** (5359 unique samples) :

name:	sn10jungle
instrument:	Sonor "Jungle Snare", 10 x 2.
description:	A snappy drum with high pitched snare. It is a unique drum and has 16 jingles attached to it, not unlike a tambourine. Though classed as an effects drum, the jingles are hardly noticeable, except on rim-shots and when playing with hands.
ambience:	①②③④⑤⑥⑦⑧⑨⑩
sample count:	881
size:	502MB
name:	sn10piccolo
instrument:	Yamaha Peter Erskine Signature Model, 10 x 4.
description:	Despite it's diminutive size, this is a rich snare and packs a significant punch. The snare wire was pulled tight resulting in a quick decay. Great stick response and a nice woody tone thanks to the 8-ply maple shell.
ambience:	①②③④⑤⑥⑦⑧⑨⑩
sample count:	200
size:	64MB
name:	sn12bop, two versions of the same tuning - muted and open
instrument:	Pearl Masters "All Maple", 12 x 7.
description:	A really expressive and musical snare. In this particular tuning, the snare wire and skin resonance play a more prominent role than the shell in defining the sound; although the rim-shots and cross-sticks have a really sweet, woody tone. The "open" variation has a full wonderful sustain and is alive with overtones. The muted version keeps the tone of the drum but hushes the overtones which may be too much for denser mixes.
ambience:	①②③④⑤⑥⑦⑧⑨⑩
sample count:	2347
size:	1.25GB
name:	sn12dead
instrument:	Pearl Masters "All Maple", 12 x 7.
description:	Tuned low and heavily muted. Very little snare wire resonance.
ambience:	①②③④⑤⑥⑦⑧⑨⑩
sample count:	164
size:	43MB



name:	sn12funk
instrument:	Pearl Masters "All Maple", 12 x 7.
description:	Tuned to bring out the tone of the shell and let the listener know this snare is 7" deep! Top skin pulled fairly tight for a quick stick response. The rim-shots have immense power and overall the drum has incredible focus and punch; this will be sure to cut through any mix.
ambience:	1 2 3 4 5 6 7 8 9 10
sample count:	407
size:	171MB
name:	sn12orleans
instrument:	Pearl Masters "All Maple", 12 x 7.
description:	Tuned as low as the drum and skin would handle. Snare wire and resonant head adjusted to allow for maximum sustain. A big, fat, wet sound.
ambience:	1 2 3 4 5 6 7 8 9 10
sample count:	186
size:	134MB
name:	sn12tight
instrument:	Pearl Masters "All Maple", 12 x 6.5.
description:	A cross between sn12funk and sn12dead.
ambience:	1 2 3 4 5 6 7 8 9 10
sample count:	347
size:	159MB
name:	sn14metal
instrument:	Gretsch "Crystal Tone", 14 x 5.5.
description:	A dirty, rough-round-the-edges steel snare sound. Tuned high to get a nice fast attack and high overtones.
ambience:	1 2 3 4 5 6 7 8 9 10
sample count:	293
size:	218MB
name:	sn14rock
instrument:	Gretsch USA Maple, 14 x 5.
description:	What this snare lacks in stick response, it makes up for in meat; this snare is the definition of beef. Nothing subtle here – tuned low and fat. Chunky rim-shot sound.
ambience:	1 2 3 4 5 6 7 8 9 10
sample count:	534
size:	253MB

**Kick-drums** (668 unique samples) :

name:	kd14bop
instrument:	Gretsch USA Maple, 14 x 11 floor tom, positioned and played as a kick.
description:	Although this started as an experiment, this floor tom prove to be a great sounding high kick drum – perfect for bop.
ambience:	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
sample count:	229
size:	95.4MB
name:	kd20full
instrument:	Gretsch USA Maple, 20 x 16.
description:	Resonant and batter head tuned low for a full sound. Heavily dampened. Good all round sound which will cut through a mix.
ambience:	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
sample count:	95
size:	18.3MB
name:	kd20punch
instrument:	Gretsch USA Maple, 20 x 16.
description:	Resonant head tuned higher than batter head – tight beater response. Lay into this drum and the reason behind the name will be revealed! Medium dampening allows for some resonance in the low mids.
ambience:	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
sample count:	194
size:	52MB
name:	kd22boom
instrument:	Gretsch USA Maple, 22 x 18.
description:	Explosive; definitely not a typical studio kick. The batter head is tuned low for a meaty beater sound, while the higher pitched, un-muted, un-ported resonant head produces a lot of sustain and body.
ambience:	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
sample count:	107
size:	36.8MB
name:	kd22noreso
instrument:	Gretsch USA Maple, 22 x 18.
description:	Heavily muted and tuned low. Resonant head removed.
ambience:	① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
sample count:	43

size: 6.91MB

### Hi-hats (4204 unique samples) :

name:	hh13, a.k.a. "ns_dreamhats"
instrument:	UFIP 13" "Bionic Series".
description:	We are yet to hear a better set of hi-hats: enormous dynamic range, focused stick sound, tight and clean "chick" (thanks to the three air holes), massive sustain, even tone across the register and an impossible combination of warmth and presence. These are also (by far) the loudest hi-hats we've ever heard but remain detailed and full of response right through the dynamic range. Accept no substitutes – this is the real deal.
sample count:	3504
size:	4.43GB
name:	hh14
instrument:	Meinl 14" "One of a Kind" medium.
description:	A slightly tamer hi-hat, but only when compared to the ns_dreamhats! These ooze expression and have great playability. Stick sound isn't too pronounced which can help these hi-hats sit in a mix. Has a medium sustain and a relatively quiet "chick" and splash sound. A perfect alternative to the 13" hi-hats, with a greatly different character.
sample count:	700
size:	397MB

### Cymbals (1858 unique samples) :

name:	cy8splash
instrument:	UFIP 8" "Natural Series" splash.
description:	Nothing compares to the unique sound of UFIP splashes and this 8" beauty is no exception. Slightly darker sounding and more stick sound than the 9" splash.
sample count:	144
size:	149MB
name:	cy9splash
instrument:	UFIP 9" "Natural Series" light splash.
description:	A really smooth response and an even decay. Rich in high overtones.
sample count:	134
size:	143MB
name:	cy12splash
instrument:	UFIP 12" "Natural Series" splash.

description:	Similar in character to the 8" splash, but with a stronger fundamental and more pronounced stick sound. Full midrange.
sample count:	160
size:	300MB
name:	cy15crash
instrument:	UFIP 15" "Natural Series" crash.
description:	A dark cymbal with a quick decay. Strong undertones and thick stick sound.
sample count:	196
size:	541MB
name:	cy18crash
instrument:	UFIP 18" "Rough Series" crash.
description:	This is an exceptionally loud cymbal that takes all you can throw at it. This is the brightest cymbal in the pack and has a full sustain. Can also work as an auxiliary ride. Handle with care!
sample count:	194
size:	673MB
name:	cy19china
instrument:	Zildjian 19" "K Series" china.
description:	A trashy china sound with a fast decay. Handles quite a bit of force before breaking up.
sample count:	183
size:	418MB
name:	cy19ride
instrument:	UFIP 19" "Experience Series" thin vintage ride.
description:	An extraordinarily expressive cymbal. Crafted in the old style, this has a warm, dark and mellow sound. Exceptionally articulate stick sound. Opens up to a crash sound when pushed.
sample count:	418
size:	1.57GB
name:	cy19sizzle
instrument:	UFIP 19" "Experience Series" thin vintage ride.
description:	As above, but with a sizzle chain attached.
sample count:	243
size:	638MB

name:	cy20ride
instrument:	UFIP 20" "Natural Series" heavy ride.
description:	Very pronounced stick sound and, on account of its thickness, almost impossible to crash. Very articulate and even across the dynamic range. Strong fundamental, incredible sustain and remarkable power make this one of the most characterful UFIPs available.
sample count:	181
size:	859MB

**Toms** (5894 unique samples) :

name:	tm_bop
instrument:	Gretsch USA Maple, 8 x 7, 10 x 8, 12 x 9, 14 x 11 & 16 x 16
description:	Tuned tightly with some moderate muting on the higher toms. Stick response is second to none and rim-shots have an almost timbale-like sound. The drums were tuned to have an open, ringy sound, ideally suited to bop and styles where a higher pitched, more melodic tom is required. Brushes and mallets have a particularly pleasing timbre on these toms.
ambience:	①②③④⑤⑥⑦⑧⑨⑩
sample count:	2484
size:	2.16GB
name:	tm_dry
instrument:	Gretsch USA Maple, 10 x 8, 12 x 9 & 14 x 11
description:	Heavily dampened on both the batter and resonant head. A crisp, tight studio sound with plenty of attack.
ambience:	①②③④⑤⑥⑦⑧⑨⑩
sample count:	384
size:	159MB
name:	tm_noreso
instrument:	Gretsch USA Maple, 10 x 8, 12 x 9 & 14 x 11
description:	The resonant head is removed and the batter head is tuned as low as possible. Mic's were also used inside the toms. Possibly the most un-subtle tom sound ever recorded!
ambience:	①②③④⑤⑥⑦⑧⑨⑩
sample count:	135
size:	131MB
name:	tm_rock
instrument:	Gretsch USA Maple, 8 x 7, 10 x 8, 12 x 9, 14 x 11 & 16 x 16
description:	Tuned to get optimal power, punch and volume from the drum with the batter heads tuned slightly higher than the resonant. The more taught head helps give a more biting stick response, particularly noticeable on the louder hits. Each tom is tuned in sympathy with the fundamental of the shell to get a really full tone and help the drum sing at lower velocities. Some moon gel used to tame the higher overtones.
ambience:	①②③④⑤⑥⑦⑧⑨⑩
sample count:	2891
size:	2.35GB



**Percussion** (253 unique samples) :

name:	pn8cowbell
instrument:	Meinl 8" "Original Real Player" steelbell
description:	A deep, powerful cowbell with excellent projection and a cutting attack.
sample count:	253
size:	110MB

**APPENDIX 2: articulation charts.**

**Snares:**

instrument	sticks				snare wire		articulations									brush articulations		
	stx	mlt	brs	hnd	on	off	ord	e2c	rms	rmh	prs	rim	xtk	rol	slp	cls	opn	sweeps
sn10jungle	✓				✓		✓	✓	✓	✓	✓	✓	✓	✓				
	✓					✓	✓		✓	✓	✓	✓	✓					
				✓		✓	✓		✓						✓			
	stx	mlt	brs	hnd	on	off	ord	e2c	rms	rmh	prs	rim	xtk	rol	slp	cls	opn	sweeps
sn10piccolo	✓				✓		✓		✓		✓		✓					
	stx	mlt	brs	hnd	on	off	ord	e2c	rms	rmh	prs	rim	xtk	rol	slp	cls	opn	sweeps
sn12bop (muted)	✓				✓		✓	✓	✓	✓	✓	✓	✓					
	✓					✓	✓		✓									
	stx	mlt	brs	hnd	on	off	ord	e2c	rms	rmh	prs	rim	xtk	rol	slp	cls	opn	sweeps
sn12bop (open)	✓				✓		✓	✓	✓	✓		✓	✓					
	✓					✓	✓	✓	✓	✓	✓	✓						
		✓			✓		✓											
		✓				✓	✓											
			✓		✓				✓							✓	✓	✓
			✓			✓			✓							✓	✓	
				✓	✓		✓											
				✓		✓	✓											
stx	mlt	brs	hnd	on	off	ord	e2c	rms	rmh	prs	rim	xtk	rol	slp	cls	opn	sweeps	
sn12dead	✓				✓		✓		✓		✓							
	stx	mlt	brs	hnd	on	off	ord	e2c	rms	rmh	prs	rim	xtk	rol	slp	cls	opn	sweeps
sn12funk	✓				✓		✓	✓	✓	✓	✓		✓	✓				
			✓		✓											✓		
	stx	mlt	brs	hnd	on	off	ord	e2c	rms	rmh	prs	rim	xtk	rol	slp	cls	opn	sweeps
sn12orleans	✓				✓		✓		✓	✓	✓		✓	✓				
	stx	mlt	brs	hnd	on	off	ord	e2c	rms	rmh	prs	rim	xtk	rol	slp	cls	opn	sweeps
sn12tight	✓				✓		✓	✓	✓	✓	✓		✓	✓				
	stx	mlt	brs	hnd	on	off	ord	e2c	rms	rmh	prs	rim	xtk	rol	slp	cls	opn	sweeps
sn14metal	✓				✓		✓		✓		✓		✓					
	✓					✓	✓		✓		✓							
	stx	mlt	brs	hnd	on	off	ord	e2c	rms	rmh	prs	rim	xtk	rol	slp	cls	opn	sweeps
sn14rock	✓				✓		✓		✓		✓		✓	✓				
	✓					✓	✓		✓		✓		✓					
			✓		✓											✓	✓	✓

**Kick-drums:**

instrument	snare wire		articulations	
	on	off	cls	opn
kd14bop	✓	✓	✓	✓
kd20full	✓		✓	✓
kd20punch	✓	✓	✓	✓
kd22boom	✓	✓	✓	✓
kd22noreso	✓		✓	✓

**Hi-hats:**

instrument	sticks				open-ness	articulations									
	stx	mit	brs	hnd		ord, l	ord, r	top, l	top, r	bel	grb	ped	spl	rim	sws
hh13 (ns_dreamhats)	✓				a	✓	✓	✓	✓	✓					
	✓				b	✓	✓	✓	✓						
	✓				c	✓	✓	✓	✓						
	✓				d	✓	✓	✓	✓						
	✓				e	✓	✓	✓	✓		✓				
	✓				f	✓	✓	✓	✓						
	✓				g	✓	✓	✓	✓	✓					
	✓				h	✓	✓	✓	✓		✓	✓			
	✓				i	✓	✓	✓	✓						
	✓				j	✓	✓	✓	✓	✓	✓	✓	✓		
	✓				k	✓	✓	✓	✓						
	✓				l	✓	✓	✓	✓						
	✓				m	✓	✓	✓	✓	✓	✓	✓	✓		
	✓				n		✓		✓						
	✓				o		✓		✓						
	✓				p		✓		✓	✓	✓	✓	✓	✓	✓
(hh13)		✓			a	✓	✓								
		✓			b	✓	✓								
		✓			c	✓	✓				✓				
		✓			d	✓	✓								
		✓			e	✓	✓				✓				
		✓			f	✓	✓			✓					

(hh13)			✓		a	✓	✓								
			✓		b	✓	✓								
			✓		c	✓	✓				✓				
			✓		d	✓	✓								
			✓		e	✓	✓				✓				
			✓		f	✓	✓				✓				✓
	stx	mlt	brs	hnd	open-ness	ord, l	ord, r	top, l	top, r	bel	grb	ped	spl	rim	sws
(hh13)				✓	a	✓									
				✓	b	✓									
				✓	c	✓									
hh14	✓				a	✓	✓	✓	✓	✓					
	✓				b	✓	✓	✓	✓						
	✓				c	✓	✓		✓	✓					
	✓				d		✓		✓		✓	✓			
	✓				e		✓		✓	✓			✓		
(hh14)		✓			b		✓								
		✓			d		✓								
		✓			e					✓					
(hh14)			✓		b	✓	✓								
			✓		d		✓								
			✓		e				✓						
(hh14)				✓	b		✓								
				✓	d				✓						

**Cymbals:**

instrument	sticks				articulations									
	stx	mlt	brs	hnd	ord <sup>5</sup>	crs	top	elv	bel	grb	rim	rol	sws	
cy8splash	✓				✓					✓	✓			
		✓									✓			
			✓			✓					✓			✓
				✓		✓					✓			
cy9splash	stx	mlt	brs	hnd	ord	crs	top	elv	bel	grb	rim	rol	sws	
	✓				✓					✓				
		✓			✓					✓		✓		
			✓		✓					✓			✓	
				✓	✓					✓				

<sup>5</sup> This articulation differs, depending on the particular cymbal – e.g. a crash/splash “ord” hit would be using the shank of the stick on the edge. A ride, on the other hand, would be hit on top with the stick tip.

cy12splash	✓				✓		✓		✓	✓	✓		
		✓			✓					✓		✓	
			✓		✓					✓			✓
				✓	✓					✓			

... cymbals continued on next page ...

	stx	mlt	brs	hnd	ord	crs	top	elv	bel	grb	rim	rol	sws
cy15crash	✓				✓		✓		✓	✓	✓		
		✓			✓					✓		✓	
			✓		✓					✓			✓
				✓	✓					✓			
	stx	mlt	brs	hnd	ord	crs	top	elv	bel	grb	rim	rol	sws
cy18crash	✓				✓		✓		✓	✓	✓		
		✓			✓					✓		✓	
			✓		✓					✓			✓
				✓	✓					✓			
	stx	mlt	brs	hnd	ord	crs	top	elv	bel	grb	rim	rol	sws
cy19china	✓				✓		✓			✓			
		✓			✓					✓		✓	
			✓		✓					✓			✓
				✓	✓					✓			
	stx	mlt	brs	hnd	ord	crs	top	elv	bel	grb	rim	rol	sws
cy19ride	✓				✓	✓		✓	✓	✓	✓		
		✓			✓				✓	✓		✓	
			✓		✓				✓	✓			✓
				✓	✓					✓			
	stx	mlt	brs	hnd	ord	crs	top	elv	bel	grb	rim	rol	sws
cy19sizzle	✓				✓			✓	✓	✓			
		✓			✓				✓	✓			
			✓		✓				✓	✓			✓
				✓	✓					✓			
	stx	mlt	brs	hnd	ord	crs	top	elv	bel	grb	rim	rol	sws
cy20ride	✓				✓			✓	✓	✓	✓		
		✓			✓					✓		✓	
			✓		✓				✓	✓			✓
				✓	✓					✓			

**Toms :**

instrument	sticks				articulations				
	stx	mlt	brs	hnd	on	off	ord	rms	rim
tm8rock, tm10rock & tm12rock.	✓				✓		✓	✓	
	✓					✓	✓	✓	✓
		✓	✓	✓	✓	✓	✓	✓	
tm14rock & tm16rock	✓	✓	✓	✓	✓		✓	rh only	
	✓	✓	✓	✓		✓	✓	rh only	✓
		✓	✓	✓	✓	✓	✓		
tm8bop & tm10bop	✓					✓	✓	✓	✓
		✓	✓	✓		✓	✓		

tm12bop & tm14bop	✓				✓		✓	✓	
	✓					✓	✓	✓	✓
tm12bop		✓		✓	✓	✓	✓		
	stx	mlt	brs	hnd	on	off	ord	rms	rim
tm16bop			✓			✓	✓		
	✓				✓		✓	✓	
	✓					✓	✓	✓	✓
		✓			✓	✓	✓		
tm_dry	✓				✓	✓	✓		
tm_noreso	✓				✓	✓			

**Percussion:**

instrument	sticks				articulations	
	stx	mlt	brs	hnd	ord	top
pn8cowbell	✓				✓	✓
		✓	✓	✓	✓	
pn8cowbellm	✓				✓	✓
		✓			✓	

**APPENDIX 3: hi-hat openness charts for HALion mappings.****hh13, sticks:**

degree of open-ness	articulations and associated CC#04 value					
	ord/top	bel	ped*	grb	spl*	rim
a	0 - 7	0 - 15				
b	8 - 15					
c	16 - 23					
d	24 - 31	16 - 31				
e	32 - 39			0 - 39		
f	40 - 47					
g	48 - 55	32 - 63				
h	56 - 63		0 - 7	40 - 63		
i	64 - 71					
j	72 - 79	64 - 79	8 - 39	64 - 79	0 - 95	
k	80 - 87					
l	88 - 95					
m	96 - 103	80 - 119	40 - 119	80 - 119	96 - 119	
n	104 - 111					
o	112 - 119					
p	120 - 127	120 - 126	120 - 127	120 - 127	120 - 127	127

\*controlled with mod-wheel

**hh13, mallets and brushes:**

degree of open-ness	articulations and associated CC#04 value		
	ord	grb	bel
a	0 - 21		
b	22 - 43		
c	44 - 65	0 - 45	
d	66 - 87		
e	88 - 109	46 - 127	
f	110 - 127		0 - 127

**hh13, hands:**

degree of open-ness	articulations and associated CC#04 value
	ord
a	0 - 63 (midi note # 42)
b	64 - 127 (midi note # 42)

c

0 – 127 (midi note # 46)

**hh14, sticks:**

degree of open-ness	articulations and associated CC#04 value	
	ord	bel
a	0 - 25	0 - 25
b	26 - 50	26 - 101
c	51 - 76	
d	77 - 101	
e	102 - 127	102 - 127

**hh14, mallets and brushes:**

degree of open-ness	articulations and associated CC#04 value	
	ord	
b	0 - 45	
d	46 - 85	
e	86 - 127	

**hh13, hands:**

degree of open-ness	articulations and associated CC#04 value	
	ord	
b	0 – 127 (midi note # 42)	
d	0 – 127 (midi note # 46)	



**APPENDIX 4: sample-count breakdown.**

Instrument	stx/ord	mlt	brs	hnd
cy8splash	52	36	34	29
cy9splash	42	38	35	27
cy12splash	74	41	33	21
cy15crash	94	47	50	17
cy18crash	96	56	39	15
cy19china	82	42	42	25
cy19ride	201	102	104	22
cy19sizzle	89	54	80	24
cy20ride	86	32	54	17
hh13	2513	647	688	258
hh14	494	110	140	84
kd14wbop	133			
kd14bop	96			
kd20full	95			
kd20wpunch	91			
kd20punch	103			
kd22wboom	59			
kd22boom	48			
kd22noreso	43			
pn8cowbell	74	36	25	15
pn8cowbellim	75	28		
sn10wjungle	421			
sn10jungle	321			146
sn10piccolo	200			
sn12wbopm	575			
sn12bopm	136			
sn12wbop	444	57	385	46
sn12bop	407	58	381	46
sn12dead	164			
sn12funk	348		41	
sn12orleans	190			
sn12tight	351			
sn14wmetal	164			
sn14metal	129			
sn14wrock	203		156	
sn14rock	179			
tm_wrock	677	323	303	205
tm_rock	639	338	303	194
tm_wbop	794	353		259
tm_bop	776	334	413	258
tm_wdry	189			
tm_dry	195			
tm_noreso	135			

# APPENDIX 5: universal mapping chart.

	0	46	86	127
11	kd_cls_oxxx	kd_cls_oxxx	kd_cls_oxxx	kd_cls_oxxx
12	kd_opn_oxxx	kd_opn_oxxx	kd_opn_oxxx	kd_opn_oxxx
13	sn_ord	sn_e2cl	sn_xtk_oxxx	sn_xtk_oxxx
14	sn_prsl	sn_prsl	sn_rml	sn_rfm
15	sn_prsl	sn_prsl	sn_rdl	sn_rdl
16	hh_ord	hh_ord	hh_ord	hh_ord
17	hh_topl	hh_topl	hh_topl	hh_topl
18	hh_topl	hh_topl	hh_topl	hh_topl
19	hh_spl	hh_spl	hh_spl	hh_spl
20	hh_spl	hh_spl	hh_spl	hh_spl
21	hh_bel	hh_bel	hh_bel	hh_rim
22	hh_bel	hh_bel	hh_bel	hh_rim
23	hh_bel	hh_bel	hh_bel	hh_rim
24	hh_bel	hh_bel	hh_bel	hh_rim
25	hh_bel	hh_bel	hh_bel	hh_rim
26	hh_bel	hh_bel	hh_bel	hh_rim
27	hh_bel	hh_bel	hh_bel	hh_rim
28	hh_bel	hh_bel	hh_bel	hh_rim
29	hh_gtb	hh_gtb	hh_gtb	hh_gtb
30	hh_gtb	hh_gtb	hh_gtb	hh_gtb
31	hh_gtb	hh_gtb	hh_gtb	hh_gtb
32	hh_gtb	hh_gtb	hh_gtb	hh_gtb
33	hh_gtb	hh_gtb	hh_gtb	hh_gtb
34	hh_gtb	hh_gtb	hh_gtb	hh_gtb
35	hh_gtb	hh_gtb	hh_gtb	hh_gtb
36	hh_gtb	hh_gtb	hh_gtb	hh_gtb
37	hh_gtb	hh_gtb	hh_gtb	hh_gtb
38	hh_gtb	hh_gtb	hh_gtb	hh_gtb
39	hh_gtb	hh_gtb	hh_gtb	hh_gtb
40	hh_gtb	hh_gtb	hh_gtb	hh_gtb
41	hh_gtb	hh_gtb	hh_gtb	hh_gtb
42	hh_gtb	hh_gtb	hh_gtb	hh_gtb
43	hh_gtb	hh_gtb	hh_gtb	hh_gtb
44	hh_gtb	hh_gtb	hh_gtb	hh_gtb
45	hh_gtb	hh_gtb	hh_gtb	hh_gtb
46	hh_gtb	hh_gtb	hh_gtb	hh_gtb
47	hh_gtb	hh_gtb	hh_gtb	hh_gtb
48	hh_gtb	hh_gtb	hh_gtb	hh_gtb
49	hh_gtb	hh_gtb	hh_gtb	hh_gtb
50	hh_gtb	hh_gtb	hh_gtb	hh_gtb
51	hh_gtb	hh_gtb	hh_gtb	hh_gtb
52	hh_gtb	hh_gtb	hh_gtb	hh_gtb
53	hh_gtb	hh_gtb	hh_gtb	hh_gtb
54	hh_gtb	hh_gtb	hh_gtb	hh_gtb
55	hh_gtb	hh_gtb	hh_gtb	hh_gtb
56	hh_gtb	hh_gtb	hh_gtb	hh_gtb
57	hh_gtb	hh_gtb	hh_gtb	hh_gtb
58	hh_gtb	hh_gtb	hh_gtb	hh_gtb
59	hh_gtb	hh_gtb	hh_gtb	hh_gtb
60	hh_gtb	hh_gtb	hh_gtb	hh_gtb

NB: for brush kits, the following substitutions are made: sn\_ord > cls, sn\_prs > opn, sn\_xtk\_xxxx > swl, sn\_xtk\_bxxx > sws, hh\_top > ord, hh\_ord > sn\_swlc, hh\_ord > sn\_swu, cy\_rfm > sws. Articulators shown after slashes are for midlets only.