

N [ny:]

Polyphonic Ensemble Version 1.0

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Introduction

The *Ny* is a software instrument plug-in for Microsoft Windows (VST2/VST3/CLAP) and Apple macOS (VST2/VST3/AU/CLAP) simulating the classic KORG® *Lambda ES-50 Polyphonic Ensemble* from 1979. It is written in native C++ code for high performance even on “lighter” systems. The main features are:

- Close simulation of the original hardware
- 64 voices polyphony
- *Percussive* and *Ensemble* sections
- *Chorus (Phase)* effect
- Many tweakable parameters
- All parameters can be controlled by MIDI controllers
- Plug-in supports Windows and macOS (32 bit and 64 bit)

The *Ny* is based on the **iPlug2** framework maintained by **Oli Larkin and the iPlug2 team**. Big thanks, guys!!! Without your work it would not have been possible to create a resizable *Ny* user interface.

To resize the plug-in you just grab the yellow triangle at the bottom right of the window and drag it. You can save the current window size using the menu entry “Save Window Size” in the *Options Menu*.

If you have trouble with the standard version of the *Ny*, please grab the (sound-wise identical) “N” version of the plug-in which is based on the original **iPlug** framework.

Acknowledgments

- **Oli Larkin** and the **iPlug2** team.
- **Nathan Ramsden** aka *SynthNerd* (<https://synthnerd.wordpress.com>) helped me out with some invaluable information about the *Lambda* – thank you so much!
- **kraftraum** (<https://soundcloud.com/kraftraum>) has designed many the default patches 41 to 62 and did the Beta testing.
- All the folks that nagged me to do a *Lambda* simulation!

No, I am not affiliated with KORG in what relation ever except that I find myself entangled with their instruments. ☺

The *Lambda* Lies Down In Software

I couldn't resist to type this silly headline. ☺

And I always thought that my *PECS* plug-in would fully cover the *Lambda* as well, but of course I was wrong. So here we are with *Ny* (in German you would write it "nü" using one of those famous umlauts like "ö") which is a pretty silly name, I know.

As usual, here is my personal confession that *Ny* does not sound like the *Lambda* (how could it since analog rulez?) but more like a poor knock-off (because it is digital which does not rulez)¹. OK, done with that, next paragraph.

It All Sounds Greek To Me

In the beginning was the *PE-2000*², and it was good – but not perfect. And so the good folks at KORGE decided to enhance their polyphonic ensemble and name it Λ (*Lambda*, a Greek letter) as they also did with its siblings, the Δ (*Delta*) *DL-50* and the Σ (*Sigma*) *KP-30*.

Seriously: A direct competitor of that time, the famous *Solina* string ensemble, is sounding great because of its patented unique Ensemble effect. But if you switch that effect off you will get some basic organ-style stuff with a single oscillator bank and paraphonic articulation. The *PE-2000* is much more than that because it features *three* oscillator banks, and the *Lambda* even tops it with fully polyphonic articulation (well, up to specific degree), an additional *Percussive* section, and a Chorus effect (called *Chorus Phase* although it is not a Phaser).

So it is no surprise that the *Lambda* still has its fan base, and one of these guys is Nathan aka *SynthNerd* who also covers a lot of the technical details in his blog at <https://synthnerd.wordpress.com>.

What's In The Box?

Compared to the *PE-2000*, the *Lambda* extends the number of presets from 8 to 9, and four of those come with the new *Percussive* section³ to reproduce instruments like (*Electric*) *Piano* and *Clavi(net)*. The result is far from convincing but that is not the point: It definitely extends the sonic capabilities of the *Lambda*.

The other five presets are located in the *Ensemble* section: *Brass*, *Organ*, *Chorus* (choir) and *Strings I+II*. The *Brass* preset features its own single VCF (voltage controlled filter) which is paraphonic i.e. together for all played keys. However, in the context of the instrument this is no real disadvantage. Note that all presets can be activated in any combination!

Unfortunately the *Lambda* does not have the cunningly designed (although hidden under the hood) pre-filters of the *PE-2000* which provided IMHO a "better" preset sound-shaping with respect to the played note's pitch. Instead the preset filters of the *Lambda* are static and consequently a bit "limited".

1 Yes, I know, all my plug-ins sound the identical and not analogish at all...

2 Yes, I know, there was also the *PE-1000*...

3 Yes, I know, the *PE-1000* was able to do percussive sounds as well...

Three Banks To Rule Them All

The three oscillator banks of the *Lambda* are producing 16', 8', 4', and 2' square wave signals simultaneously. To generate sawtooth signals the four square wave signals are added together – as it is done in many organs, strings ensembles and even synthesizers of that era, too. The resulting “staircase sawtooth” is not perfect but good enough for most applications.

The oscillator banks are of course a resource that has to be used wisely. Thus, they will be shared among the selected presets in the following manner:

- The *Percussive* presets will always and solely use bank 1.
- The *Brass* preset will always and solely use banks 1 and 2.
- If any *Percussive* preset is selected, the *Ensemble* presets (not *Brass*) will use banks 2 and 3.
- If no *Percussive* preset is selected, the *Ensemble* presets (not *Brass*) will use all the banks 1, 2 and 3.

Connoisseurs of the *Lambda* already know about that. But there is more quirky stuff to come:

All three banks feature *individual envelopes per key* for shaping the amplitude contour. The bank 1 envelopes are of the Attack/Decay (A/D) type while the bank 2 and 3 envelopes are of the Attack/Release (A/R) type. When no *Percussive* preset is selected, bank 1 is used for the *Ensemble* section as well – but bank 1 does not sport (variable) A/R envelopes. In this case the individual A/D envelopes of bank 1 are disabled and replaced by a *global* (i.e. paraphonic) Attack/Release envelope that retriggers for each note played! [Thanks again to Nathan aka *SynthNerd* for confirming my assumptions here when studying the *Lambda's* schematics.] It is quite surprising that you really have to try hard to hear this effect.

Funny enough, the *Brass* presets behaves differently: When a *Percussive* preset is selected, bank 1 keeps its A/D and bank 2 its A/R envelopes (i.e. no global envelope is used for the *Brass* preset). Of course there is another global A/D envelope that exclusively modulates the *Brass* VCF.

Confused? Who wouldn't be. But in the end it all makes some sense. And *Ny* does simulate all these quirks.

The Ny – An Overview

The *Ny* basically consists of two sections: *Percussive* and *Ensemble*. There is also a Chorus effect and some options to tweak the sound – some of them not available at the original *Lambda* hardware. The instrument itself is fully polyphonic... ah, not quite, only 64-voice polyphonic.

The *Ensemble* Section

It is fair to state that this is the heart of the *Ny*. There are five presets: *Brass*, *Organ*, *Chorus* (which is actually a *choir*), *Strings I*, and *Strings II*⁴.



Strings II is very similar to *Strings I* but one octave higher, while *Chorus* is technically similar to *Strings I* but fed through a fixed peaking bandpass filter to give it an “A” vowel-like sound. *Brass* is a classic synth brass patch, and *Organ* sounds more like a pipe organ than a “rock” organ.

The “VIB. OFF” switch deactivates the Vibrato effect applied to the *Chorus* and *Strings* presets. Note that the Vibrato *speed* is the same for all three oscillator banks but the *frequency shift* is out of phase. This means that when bank 1 is shifted positively, bank 2 is not shifted at all while bank 3 is shifted negatively and so on. This allows for a rich Ensemble effect without actually using an Ensemble effect.

“ATT. REL. VAR” (“Variable Attack/Release”) activates the two knobs on the right to set custom Attack and Release times. In theory these should apply for the *Chorus* and *Strings* presets only, but due to the nature of the oscillator banks and their envelopes (see section *Three Banks To Rule Them All*) they will also affect the *Brass* and *Organ* presets when at least one preset of both of these groups is activated simultaneously (for example *Brass+Strings I* or *Organ+Chorus*). The same is true for the Vibrato effect!

The five knobs below the preset switches control the individual level of each preset. The *Lambda* originally does not have such an option and uses fixed levels. Personally, I think this tweak is quite useful.

4 The rocker switches in the UI read “String I” and “String II”. This is to provide better readability at of lower graphic resolutions.

The *Percussive* Section

The four presets of the *Percussive* section are *Electric Piano*, *Clavi*, *Piano*, and *Harmonics*. The Decay time of the presets can be adjusted using the knob on the lower right while the "SUST." (Sustain) switch sets the Release time equal to the Decay time (I remember some other keyboards from the good old days where this function was described as "applying a reverb effect" – which is of course nonsense...).



The *Percussive* section also features a Tremolo effect that can be (de)activated using the "TREM." switch. The speed of the effect can be set as well.

As in the *Ensemble* section the four knobs below the preset switches (which are not available on the *Lambda*) control the individual level of each preset.

Modifier Sections

To some degree the sound of the *Ny* can be tweaked further using the (what I call) *regular modifier sections* – "regular" in the sense that they are available on the original hardware, too.



The *Tune* section controls the overall tuning ("Total Tune") and the individual tuning of oscillator bank 2 (here called "Tune A") and oscillator bank 3 ("Tune B"). The LEDs on top of the A/B Tune knobs visualize the amount of "beating" of the detuning.

The *Accent* section sports two knobs: One for adjusting the cutoff frequency of the *Brass* VCF (see section *More Tweak Sections*) and one for controlling the level of "key-click" of (and only of) the *Electric Piano* preset. To my taste the latter sounds pretty awkward, but who am I to judge...

The *Tone* section consists of two simple lowpass filters – one for the *Percussive* and one for the *Ensemble* section. The frequency of these filters can be controlled individually.

As the name suggest you can set the volume in the *Volume* section. Here you find a minor difference to the original hardware: It is possible to set the panorama position of the *Percussive* and the *Ensemble* section, too. The *Lambda* has three outputs: *Mix Out* (a simple mono mix) and *Stereo L + R*. The latter two (*L* and *R*) are the dry *Ensemble* section output plus the *Chorus Phase* output of the *Percussive* section and the dry *Percussive* section output plus the *Chorus Phase* output of the *Ensemble* section. I think it is useful to have dedicated panorama knobs here (especially given the tweak parameter *X-Stereo* of the *Chorus Phase* section).

Finally you can pitch up the whole instrument by one octave using the "OCT. UP" switch in the *Octave* section.

Chorus Phase

Well, this is "just" a Chorus effect (not sure where the term "Phase" comes from). On the *Lambda* you can only switch it off per preset section and control its speed using the classic KORG joystick control. The *Ny* offers some more tweaks: You can set the minimum Chorus speed and its modulation depth (the maximum speed is controlled via the Modulation Wheel – see section *More Tweak Sections*). Finally, you can select if the individual Chorus signals of the preset sections should be put to the opposite panorama position of the dry signals (*X-Stereo* is on) or not (*X-Stereo* is off).



More Tweak Sections



Modulation features the amount of Pitch Bend (\pm notes) and the Modulation Wheel controlling the (maximum) speed of the *Chorus Phase*. In contrary to the *Lambda*, the *Ny* also accepts *Velocity* information.

While the parameters of the *Lambda's* Brass VCF cannot be modified (with the exception of the *Brass fc* control in the *Tone* section), *Ny* offers some more control here: *Peak* (the resonance of the VCF), envelope intensity and *Attack/Release* times.

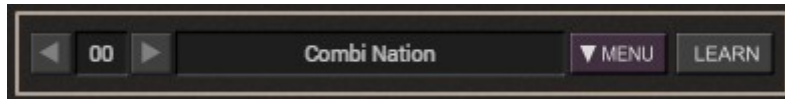
The speed of the Vibrato effect can be set in the *Vibrato* section. It is also possible to set the depth of the effect for the *Chorus* and the *Strings* separately. However, since the three oscillator banks are used for all presets together, the final Vibrato depth depends on the preset selection: If *Chorus* is selected, the *Chorus* Vibrato depth is used – else the *Strings* depth applies.

The tweak parameter for the *Chorus Phase* have already been dicussed above.

Plugin Handling

Control Section

The *Lambda* is a preset machine, but it is not possible to store the selected presets along with all the tweaked parameters. Being a software plug-in, the *Ny* can do this, and you even can give a name to such a *Program*.



Options Menu

When clicking the *Menu* button in the *Control* section, a context menu opens with the following options:

Copy Program	Copy current program to internal clipboard
Paste Program	Paste internal clipboard to current program
Init Program	Initialize the current program
Load Program	Load a program file containing a patch to <i>Ny</i> 's current program
Save Program	Save <i>Ny</i> 's current program to a program file
Load Bank	Load a bank file containing 64 patches into <i>Ny</i>
Save Bank	Save <i>Ny</i> 's 64 patches to a bank file
Select Startup Bank	Select the bank file that should always be loaded when <i>Ny</i> is started
Load Startup Bank	Load the Startup bank file; can also be used to check what the current Startup bank is
Unselect Startup Bank	Unselect the current Startup bank
Default Path for Program Files	Sets the default path for program and bank files
MIDI Thru	Set globally if MIDI data sent to <i>Ny</i> should be sent through to its MIDI output (stored in configuration file)
Ignore Program Change	Set globally if MIDI Program Change data sent to <i>Ny</i> should be ignored (stored in configuration file)
Reload Configuration	Reload <i>Ny</i> 's configuration file
Save Configuration	Save <i>Ny</i> 's configuration file
Check Online for Update	When connected to the Internet, this function will check if a newer version of <i>Ny</i> is available at fullbucket.de
Visit fullbucket.de	Open fullbucket.de in your standard browser

The *ny.ini* Configuration File

The *Ny* is able to read some settings from a configuration file (*ny.ini*). The exact location of this file depends on your operating system and will be displayed when you click on "Reload" or "Save Configuration".

MIDI Control Change Messages

All parameters of the *Ny* can be controlled by MIDI controllers, or more precise: Each MIDI controller (except *Modulation Wheel* and *Sustain Pedal*) can control one of *Ny*'s parameters. The mapping is defined in the *ny.ini* for example like this:

```
[MIDI Control]
CC7  = 1  # Volume Ensemble
CC70 = 8  # Brass fc
CC71 = 43 # Brass Peak
...
```

The syntax is straight forward:

```
CC<controller number> = <parameter ID>
```

Given the above example, controller 7 directly controls the *Volume Ensemble* parameter, controller 70 the *Brass fc* etc. As you can see, comments are introduced by the Pound sign (#); they are here just for description purposes and completely optional. Note that the *controller number* can run from 0 to 110, with the exception of 1 (*Modulation Wheel*) and 64 (*Sustain Pedal*); the latter two are simply ignored.

MIDI Learn

The easiest way to assign MIDI controllers to *Ny* parameters is to use the *MIDI Learn* function. To activate MIDI Learn, click on the LEARN button and wiggle both the MIDI controller and the *Ny*'s parameter that you want to link. If you want to unlearn the assignment, right-click the LEARN button (the label now reads "UNLEARN") and activate it. Now wiggle the MIDI controller or the parameter that you want to unlearn.

Parameters

Modifier Sections

parameter	id	description
<i>Volume Percussive</i>	0	Volume of the <i>Percussive</i> section
<i>Volume Ensemble</i>	1	Volume of the <i>Ensemble</i> section
<i>Pan Percussive</i>	2	Panorama of the <i>Percussive</i> section
<i>Pan Ensemble</i>	3	Panorama of the <i>Ensemble</i> section
<i>Total Tune</i>	4	Total (master) tune
<i>Tune A</i>	5	Tune of oscillator bank 2
<i>Tune B</i>	6	Tune of oscillator bank 3
<i>Octave Up</i>	7	Pitch one octave up (off/on)
<i>Brass fc</i>	8	Cutoff frequency of <i>Brass VCF</i>
<i>Electric Piano Key-Click</i>	9	Key-click level for <i>Electric Piano</i> preset
<i>Tone Percussive</i>	10	Tone control for the <i>Percussive</i> section
<i>Tone Ens</i>	11	Tone control for the <i>Ensemble</i> section

Percussive Section

parameter	id	description
<i>Perc: Sustain</i>	12	Sustain (off/on)
<i>Perc: Electric Piano</i>	13	Preset <i>Electric Piano</i> (off/on)
<i>Perc: Clavi</i>	14	Preset <i>Clavi</i> (off/on)
<i>Perc: Piano</i>	15	Preset <i>Piano</i> (off/on)
<i>Perc: Harmonics</i>	16	Preset <i>Harmonics</i> (off/on)
<i>Perc: Tremolo</i>	17	Tremolo (off/on)
<i>Perc: Tremolo Speed</i>	18	Tremolo speed
<i>Perc: Decay</i>	19	Decay time
<i>Volume Electric Piano</i>	31	Volume of <i>Electric Piano</i> preset
<i>Volume Clavi</i>	32	Volume of <i>Clavi</i> preset
<i>Volume Piano</i>	33	Volume of <i>Piano</i> preset
<i>Volume Harmonics</i>	34	Volume of <i>Harmonics</i> preset

Ensemble Section

parameter	id	description
<i>Ens: Brass</i>	20	Preset <i>Brass</i> (off/on)
<i>Ens: Organ</i>	21	Preset <i>Organ</i> (off/on)
<i>Ens: Vibrato Off</i>	22	Vibrato (on/off)
<i>Ens: Chorus</i>	23	Preset <i>Chorus</i> (off/on)
<i>Ens: Strings I</i>	24	Preset <i>Strings I</i> (off/on)
<i>Ens: Strings II</i>	25	Preset <i>Strings II</i> (off/on)
<i>Ens: A/R Variable</i>	26	Attack/Release variable (off/on)
<i>Ens: Attack</i>	27	Attack time
<i>Ens: Release</i>	28	Release time
<i>Volume Brass</i>	35	Volume of <i>Brass</i> preset
<i>Volume Organ</i>	36	Volume of <i>Organ</i> preset
<i>Volume Chorus</i>	37	Volume of <i>Chorus</i> preset
<i>Volume Strings I</i>	38	Volume of <i>Strings I</i> preset
<i>Volume Strings II</i>	39	Volume of <i>Strings II</i> preset

Chorus Phase Section

parameter	id	description
<i>Chorus Phase Percussive</i>	29	Chorus effect for <i>Percussive</i> section (off/on)
<i>Chorus Phase Ensemble</i>	30	Chorus effect for <i>Ensemble</i> section (off/on)
<i>Chorus Phase Speed</i>	50	Chorus speed
<i>Chorus Phase Depth</i>	51	Chorus depth
<i>Chorus Phase X-Stereo</i>	52	Chorus stereo mode (see <i>Chorus Phase</i> section)

Tweak Sections

parameter	id	description
<i>Pitch Bend</i>	40	Pitch Bend amount (\pm notes)
<i>Mod. Wheel</i>	41	Modulation Wheel amount
<i>Velocity</i>	42	Velocity intensity
<i>Brass Peak</i>	43	<i>Brass</i> VCF resonance
<i>Brass EG Intensity</i>	44	<i>Brass</i> VCF envelope intensity
<i>Brass Attack</i>	45	<i>Brass</i> VCF envelope Attack time
<i>Brass Release</i>	46	<i>Brass</i> VCF envelope Release time
<i>Vibrato Speed</i>	47	Vibrato speed
<i>Vibrato Chorus Depth</i>	48	Vibrato intensity for <i>Chorus</i> preset
<i>Vibrato Strings Depth</i>	49	Vibrato intensity for <i>Strings</i> presets

Frequently Asked Questions

How do I install the Ny (Windows VST2 32 bit version)?

Just copy the files `ny.dll` from the ZIP archive you have downloaded to your system's or favorite DAW's VST2 plug-in folder. Your DAW should automatically register the Ny VST2 plug-in the next time you start it.

How do I install the Ny (Windows VST2 64 bit version)?

Just copy the file `ny64.dll` from the ZIP archive you have downloaded to your system's or favorite DAW's VST2 plug-in folder. Your DAW should automatically register the Ny VST2 plug-in the next time you start it.

Note: You may have to remove any existing (32 bit) `ny.dll` from your VST2 plug-in folder or else your DAW may screw the versions up..

How do I install the Ny (Windows VST3 64 bit version)?

Just copy the files `ny.vst3` from the ZIP archive you have downloaded to your system's or favorite DAW's VST3 plug-in folder. Your DAW should automatically register the Ny VST3 plug-in the next time you start it.

How do I install the Ny (Mac VST2/VST3/AU 64 bit)?

Locate the downloaded PKG package file `ny_1_0_0_mac.pkg` in Finder (!) and do a right- or control-click on it. In the context menu, click on "Open". You will be asked if you really want to install the package because it comes from an "unidentified developer" (me 😊). Click "OK" and follow the installation instructions.

What is the plug-in ID of the Ny?

The ID is `ny50`.

...?

[intentionally left blank to answer your own questions]