Navigation Guide

by genoQs Machines, Stuttgart, Germany ©2009
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v1.62

WARNING

To prevent fire or shock hazard,
do not expose the device to
rain or moisture.

Important Notice

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genoQs Machines units are sold with tree year full warranty.This warranty covers all malfunctions that may occur from normal use. Damage caused by careless handling (improper voltage connected, exposure to damp, abuse etc.) is not covered. The unit can only be returned for repair after agreement from genoQs Machines. Customer covers cost of shipping of malfunctioning unit from customer to genoQs Machines. genoQs Machines covers shipping from genoQs Machines back to customer. genoQs Machines agrees to offer spare parts and service for all units produced by genoQs Machines also after the warranty expires as long as is possible. The warranty applies to the physical unit and applies also for customers buying units second hand where the warranty still is valid. The warranty is void without a readable serial number label.

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This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.

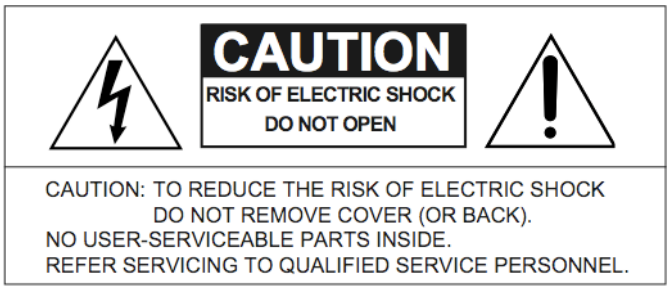
• Increase the separation between the equipment and receiver.

• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

• Consult the dealer or an experienced radio/TV technician for help.

European Union regulation compliance statement

This symbol indicates that your product must be disposed of properly according to local laws and regulations.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure; that may be of sufficient magnitude to constitute a risk of electric shock to persons.

WARNING: WHEN USING ELECTRIC PRODUCTS, BASIC PRECAUTIONS SHOULD ALWAYS BE FOLLOWED, INCLUDING THE FOLLOWING:

WARNING

Octopus is designed to be used in a standard household environment. Power requirements for electrical equipment vary from area to area. Please ensure that your Octopus meets the power requirements in your area. If in doubt, consult a qualified electrician or genoQs Machines.
120 VAC @ 60 Hz for USA and Canada
220~240 VAC @ 50 Hz for Europe
240 VAC @ 50 Hz for Australia

IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Install in accordance with the manufacture's instructions.
8. Do not install near any heat sources such as radiators, heat register, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

PORTABLE CART WARNING

S3125A

13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Do not expose this apparatus to dripping or splashing and ensure that no objects filled with liquids, such as vases, are placed on the apparatus.

WARNING
THIS APPARATUS MUST BE EARTHED
IMPORTANT

Ensure that all the terminals are securely tightened and no loose strands of wire exist.
Before replacing the plug cover, make certain the cord grip is clamped over the outer sheath of the lead and not simply over the wires.

AVIS POUR LES ACHETEURS CANADIENS DU OCTOPUS

Le présent appareil numérique n'ément pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

VENTILATION

Do not prevent the unit's ventilation, especially by placing the unit on soft carpet, in a narrow space, or by placing objects on the unit's chassis—top, side, or rear panels. Always keep the unit's chassis at least 10 centimeters from any other objects.

CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE MANUFACTURER FOR COMPLIANCE COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

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Introduction

Welcome, and sincere congratulations to the purchase of your new sequencer, a genuine genoQs Machines Octopus!

You now own one of the definitely finest MIDI instruments ever built. We proudly put in your hands a device built to drive your creativity and provide you joy for years to come.

Octopus is conceived as a living instrument with long-lasting value, to help you search and discover new sonic territory, rewarding you with an unequalled haptics experience.

We invite you to explore the capabilities of Octopus as you like and provide this manual as a start-up guide. Herein, you will recognize many known terms and concepts. However, others may be used slightly differently from what you would expect and some may be entirely puzzling.

This is why we recommend that once you are over the first wave of pushing buttons, flashing lights and turning knobs you read this guide end-to-end carefully – and we are aware that no-one likes to read the manual..

Taking a step back, we do appreciate the complexity that Octopus is able to provide. Don't get intimidated! You will soon discover fast ways of operation to best suit your style and preference, the comfort zone where you are most productive.

But remember that only few clicks away await things that you had never thought of doing or achieving. This is what Octopus is about – at every stage and no matter what - you are encouraged to experiment, explore and push the boundaries!

Gabriel Seher and Marcel Achim

Stuttgart, Germany 2009

Please check our web site regularly for latest news, software and documentation

http://www.genoqs.net

Table of contents

I Octopus at a glance

This section provides an introduction to the concepts at the base of Octopus. The impatient reader may come back to this section once confusion sets in and nothing makes sense anymore.

Connectors and switches

Octopus has a variety of connectors and switches that you should be familiar with prior to operation. They are listed below.

The power connector

The power connector on the back of the Machine will take a 3-line cable. Make sure to use a grounded power source for operation. Octopus has an auto-sensing 110-240 Volt (50-60Hz) power supply so you can safely power it up in most countries without extra adapters or converters. All you need is a cable that fits your power outlet.

The power switch

To turn Octopus on and off, please use the black button labeled I/O on the back panel of the machine, next to the power connector.

The reset button

The reddish reset button just under the top right rotary encoder will simply reboot your machine, by default resetting it to the last saved state.

MIDI connectors

Octopus features two MIDI ports, and each port has its own IN and OUT connector, as found on the back side of the machine. They are labeled accordingly with MIDI 1 and MIDI 2.

Lamp connector

The lamp connector on the back of the machine is designed to operate with any USB-powered lamp, as are often used with laptop computers. Connect your preferred USB lamp to use Octopus in environments that demand it, or if (like us) you just simply like the effect!

USB connector

The USB connector on the back of Octopus does currently not carry and function related to musical applications and should be seen as something you should be only concerned with if you are interested in development or change of the Octopus software.

The Octopus world

In brief, the Octopus world consists of

- entities or objects
- attributes that are associated with them, and
- functions that modify those objects or their attributes.

This model allows for modifications of the objects in the most flexible manner and all in real time, with the sequencer running!

It is all done using an admittedly intimidating, but reportedly highly intuitive and accessible user interface.

The Octopus object model

The master Octopus object is the GRID, which contains PAGES, each of them containing TRACKS, which are made up of STEPS.

Each object is associated with attributes and functions that can be operated upon. The diagram depicts at a high level the Octopus hierarchy of objects and their related attributes.

Navigation basics

The Grid contains all Page objects and each Page is made up of Tracks and Steps. Moving around this hierarchy tree is trivial: to jump between leaves you can always go up a level and down again.

Additionally, in most situations direct paths are also provided, allowing you to jump directly from one leaf to another.

Just as an example, assuming you are in the GRID mode, you would hold the PAGE button and select the page you would like to jump into, by pressing its button. Or you would double-click on the corresponding page button.

You would do the same to get further down into a specific track and from there into a specific step. You may also choose to go from a page into a step directly, as we will see later.

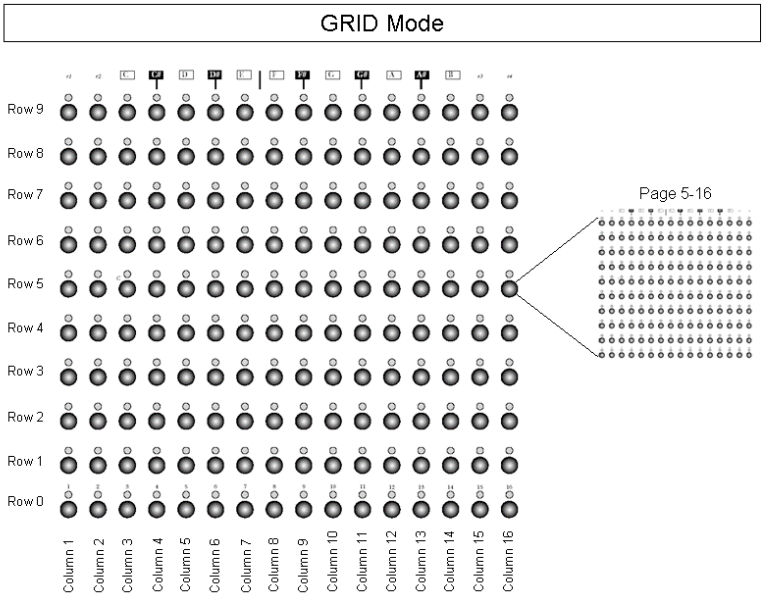
Navigating back up the tree is only one click away, and will take you directly to the selected level. Or simply use the ESC key to always get to the PAGE level of your current page, arriving at a known starting point.

Similarly, in Track mode, press TRACK and the selector corresponding to the track you would like to jump to. This works in MAP mode as well. In Step mode, press and hold STEP and press a grid button to jump to the step corresponding to the pressed button.

Grid

Octopus provides a total of 144 pages grouped in 9 banks of 16 pages each, making up the GRID.

Visually a bank corresponds to one row of the matrix; hence a page corresponds to one button of the matrix. This accounts for 9 rows (row 1-9), with row 0 serving as a grid set selector.



Each bank can be activated for current play by selecting one of its (non-empty) pages. This means that up to 9 pages may be played concurrently. For an overview please take a look at the diagram.

MIDI data output

Depending on the number of concurrently active tracks and the density of the produced MIDI data, it is possible to overload the MIDI stream. A more complete discussion of various system and MIDI loading is found in the section on System Load Handling.

Pages

One can think of Octopus' pages as track containers. The number of tracks in a page is 10, with a default length of 16 steps each.

Musical structures longer than 16 steps are built by chaining tracks in a page, such that chained tracks are played consecutively.

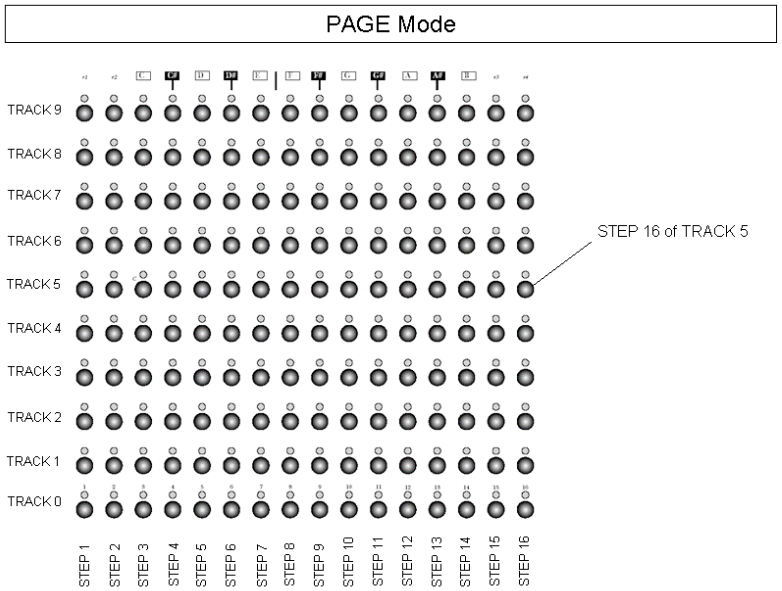
Musical structures shorter than 16 steps can be built by using skipped steps in tracks, for example. More on this later.

The preset chain modes available are:

- 10 tracks of 1 row each (default)
- 5 tracks of 2 rows each
- 2 tracks of 4 rows each + a track of 2 rows
- 1 track made up of 8 rows + a track of 2 rows.

However, the user is also free to build any other track chain configuration, as desired.

This, combined with the ability to play up to 9 pages concurrently and each of the 9 pages being part of a cluster of at most 16 consecutive pages gives you a lot of room for both composition and live play.



Tracks

If pages are Octopus' track containers, then tracks are the step containers. Apart from other attributes, each track has a locator associated with it which can be controlled independently from locators of other tracks.

Steps

In Octopus steps are the smallest meaningful entities, for example notes in a musical context. In track mode the individual steps of a selected track can be modified across their available range of attributes.

Mutators

Entities or attributes of entities can be operated upon using mutators (or functions), for example clear, randomize, modify, copy, paste, and others.

While the modify function is mapped directly to the knobs as described in the operation mode section, the others are invoked by pressing the appropriate mutator buttons.

Attributes

All of the above entities of Octopus have attributes associated with them. The range includes but is not limited to Velocity, Pitch, Length, Start, Position, and others.

Generally, attributes can be modified in real time, during play or stop. Their semantics may differ across entities and not all attributes are applicable to all entities. The attached table gives an overview of the entities and their applicable attributes.

	Page	Track	Step
VEL	+	+	+
PIT	+	+	+

	Page	Track	Step
LEN	+	+	+
STA	+	+	+
POS	+	+	+
DIR		+	
AMT		+	+
GRV		+	+
MCC		+	+
MCH		+	

Attribute Maps

The attribute maps are basically views associated with Track objects which will allow you to view and edit directly the values of all steps in a track, for a specific attribute.

For example, the velocity map of a track will show you at a glance all step velocities, allowing you to change them directly by the press of a button.

MIDI Control (CC) Maps

The MIDI Control Maps are simply assignments of CC functionality to the Mixer knobs of Octopus.

You may use Controller Maps to freely assign MIDI Controllers and their appropriate channels to the Mixer knobs, independently of what is going on in the current page.

The front panel

The Octopus front panel consists of visual groups which we will name here and to which we will refer in the course of this document. They are explained in a left to right order.

MIX encoders

Each row has a dedicated left rotary encoder – in the MIX (Mixer) group.

SEL buttons

Each row has a dedicated button in the SEL (Selector) group.

MATRIX

The MATRIX refers to the field of 16x10 buttons.

The buttons take on various functions, depending on the operating mode of the sequencer. The most obvious one is probably, when matrix rows represent tracks of 16 steps each.

Right below the matrix is the MIX TARGET field which determines the functionality of the MIX rotary knobs.

MUT buttons

Each row has a dedicated button in the MUT (Mutator) group.

EDIT encoders

Each row has a dedicated left rotary encoder – in the EDIT (Editor) group.

Circle

The circle is made of buttons that provide a range of functionality that applies across modes and objects.

Among other controls, the circle includes the SCALE, MODE, TRANSPORT, and CHORD fields and the MAIN knob.

Each of the listed building blocks of the front panel takes on specific functions according to the active mode at any point in time.

II First steps

This section is intended to get you up and running with your first sequence, and teach you the basics of Octopus operation in the process. You are encouraged to use the learned material and experiment further.

Connect and power-on

Connecting MIDI and a sound source

Start simply by connecting just one sound source to the MIDI OUT 1 port and then use the provided power cord to connect Octopus to a power outlet.

Set your sound source to receive on channel 1 and also choose a pitched sound with a medium release time. Something like piano may be suitable, but don't feel constrained in any way.

Power-on

Power on the unit by flipping the power switch.

If you have connected a USB lamp in the port labeled "Lamp", you should see it turn on immediately, and about two seconds later you should see some of the front panel LEDs turn on.

The LED labeled PAGE should be blinking orange. Congratulations – you are now ready to engage on a long and rewarding journey with your Octopus sequencer!

Upon power-on (or reset), Octopus starts in the state that was last saved to its internal FLASH (non-volatile) memory.

When you power up the machine for the first time, or after a memory refresh, the machine is starting up with its "factory default" values.

Bypassing memory reload

By the same token, if you hold the CLR button down while powering up the machine, Octopus will not load the FLASH memory contents, but will simply start with the factory defaults.

Start-up defaults

The defaults include having the master tempo at 120 b.p.m., all tracks running on direction 1, all tracks set to send on MIDI channel 1 of

port 1, and a particular pitch assignment for tracks 0-9 as follows: C3, D3, E3, G3, A3, C5, D5, E5, G5, and A5. Octopus may be reset to this default condition at any time during operation.

Resetting to start-up defaults

Please note that doing this will erase any changes you have made and possibly want to keep, so use this with extreme caution!

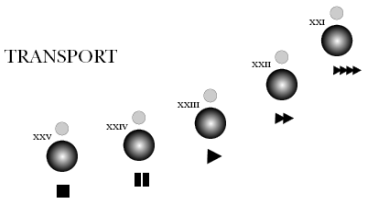
Press and hold the GRID mode button, while pressing the CLR button. Again, this only clears the RAM (volatile) memory contents and leaves the content of the FLASH (non-volatile) memory untouched.

General controls

Octopus features a set of transport buttons, which are no different from what you may know from other devices. Start, Stop and Pause functions are available.

Play

Press any of the play buttons in the transport section as depicted.



It makes no difference which one you press as long as they show an arrow in their label. The difference between them will appear later, so please bear with us for a moment.

You will see the red chase light move across the matrix. If you do not hear anything, it is because you have not yet set any steps to play.

Stop

You may now want to stop the sequencer – do that by pressing the stop button – as labeled. Stopping the sequencer will reset the chase light position to zero.

Pause

Once the sequencer is playing, you may also pause it – by pressing the pause button – as labeled. The pause button freezes the chase light at the current step. To continue from pause (to continue) you may press pause again, or any of the play buttons.

You may want to play a bit with the transport buttons to get yourself familiar with how they work.

Master Tempo

Before you continue, you may want to set a different master tempo for the sequencer. Simply turn the MAIN rotary encoder in the top right corner – clockwise (increase) or counter-clockwise (decrease).

As you turn the knob, you will see funny things happen to the lights of the top left quadrant of the outer circle. This part of the panel shows the current master tempo and displays its value.

Two other things to notice here: the LED of the button labeled Tempo is orange – this indicates that the encoder is regulating the tempo.

Interface conventions

Number display convention

The red dots have to be understood as multiple of tens, the green dot represents the value of ones in the number on display. Plus there is another red light potentially lighting up, labeled 100. That adds 100 to the number.

For example, 143 would be represented by the LEDs 100, 1, 2 and 4 lighting red, and 3 lighting green.

One exception to the rule is numbers where the tens and the one are the same digit - in that case the digit in question will light orange. For example 77 will be displayed as 7 LEDs with LED 1-6 lighting red and LED 7 lighting orange.

Experiment a bit with this and you will get a good feel for this representation quickly. You will re-encounter it at many other occasions as we move along.

Click convention

While we are here, we can introduce another convention: the click convention.

You can directly select a value by pressing the buttons in the tempo area. Double click on a number to set the ten's (red) value and single click to set the one's (green) value.

For example double click on 7 and single click on 2 to set a tempo of 72. Note that by just double clicking on a number, the ones value is set to zero.

This makes it very quick and easy to select round values like 60, 80, or 120. Selecting non-round values is just one more click away.

As with the number display convention, the click convention is used all across the instrument's interface, so we will run into it over and over again.

Step - basic operations

Step toggle

The orange blinking PAGE LED in the MODE field indicates that you are now in the PAGE mode.

For now it is enough to know that in this mode every row in the matrix represents a track, and every button represents a note or a step. This is no different as you would probably expect anyways, knowing that Octopus is a chase-light pattern sequencer. Let's press some buttons now.

Press any of the matrix buttons, and you will see the steps go on, indicated by the green lights going on. Pressing active steps will deactivate them, turning them off again.

Make sure that you set your connected sound device to MIDI Channel 1. If you do, you should hear sound played by your synthesizer.

Step skip

Toggling steps as we have seen before is sure fine – another thing you may want to do though, is skipping steps entirely. Skipping a step means that the chase-light will simply ignore the step and just move to the next un-skipped one.

To skip a step, press and hold the button of the step you want to skip and then click the MUT button. You will see the step LED turn red. Repeat the procedure for as many steps as you would like.

To un-skip a step and make it play again in the regular fashion, just press it by itself and you should see its light go off. Press it a second time - as long as you don't hold the MUT button pressed, you will see it toggle on as an active step.

Step tweak

Use what you have learned so far to compose a pattern in one of the tracks. Start the sequencer and you will hear the pattern played, boring as it is, since all steps are set to a default level.

Let's change that, but tweaking some Step attributes. We will use PIT here as an example.

Just "grab" a Step by pressing its button and keeping it pressed (it doesn't matter if it's originally on or off). Now turn the PIT rotary encoder clockwise to increase the pitch of the step.

Turning PIT counter-clockwise will decrease the pitch – one halftone per encoder click. The PIT rotary is the second one from the top of the EDIT block.

You will now hear that the pitch of the step has changed every time the chase-light passes it.

Feel free to experiment as you wish, with other attributes and refer to the section on STEP mode for details.

Grab other steps and play around until you shape your pattern into something you like before moving on.

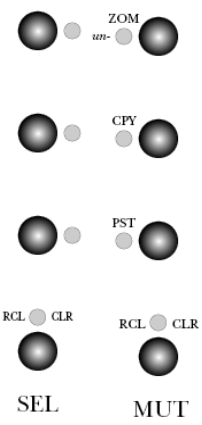
Ghost toggle

Press and hold pressed two or more step buttons placed in separate rows but in the same column. Let's use for instance the rows 3 and 4.

Press a step in row 3 and at the same time a step in row 4 – and make sure you do not release the buttons yet.

Now toggle steps in row 3 – and you will see that the steps in the same column of row 4 will be toggled as well. Or you may press steps in row 4 and see the steps in row 3 toggle as well. We call this behavior "ghost toggle".

Basic track operations



Since you now have a pattern you like, but still want to explore, let's make an identical copy of your track pattern first and then modify the copy while keeping the original safe.

On the left side of the Octopus panel you see a block called SEL, to the right of the MIX rotary encoder block. These are the Selector buttons.

Symmetrically to the right you see another block called MUT, to the left of the EDIT rotary encoder block. These are the Mutator buttons. For now we will use the selector button corresponding to our track to "grab" it, and do something – in this case copy it.

Copying tracks

Go ahead and press the track selector button of the corresponding TRACK and keep it pressed. You will see some changes in the LED pattern of the panel; don't worry about it for now. You will see that once you have grabbed a track, the mutator block becomes active and you see that the CPY mutator is now lit orange.

Press the CPY mutator and release the track (move your finger off the selector). You have just copied the track you have grabbed to an internal buffer*.

** You have not copied the full track data, but only a reference to it. This means that at the time of the paste operation you will get the most recent data of the just copied track and not the data at the time of the copy operation. Therefore, any changes between the copy and the paste operation are permanent and not recoverable.*

Pasting copied tracks

Now grab an empty track as described above by pressing its selector and keeping it pressed. You will notice that paste is now available, indicated by the lit PST mutator.

Press the PST mutator to paste the contents of your source track into the destination.

Muting tracks

The result of the previous copy and paste operation is that you now have two identical tracks in the same page.

So all you got is just an annoying double-trigger of your pattern (audible depending on your sound choice)?

Well, for now yes – unless you put one of the tracks on mute.

We will now do just that. To mute one of the tracks, first decide which track you want to mute.

Now simply press its mutator on the right and see what happens: the first press will color the mutator red and the track will not be heard. Done, the track is muted!

Pressing the mutator again will simply un-mute the track, turning the red mutator light off and letting the track play again.

Recalling mute patterns

There is also a way of handling mutes and un-mutes very quickly. Simply select a mute pattern as you normally would – i.e. mute some of the tracks in the page.

As you mute tracks in the page mode observe that the MUT button turns green. Pressing the MUT button will immediately un-mute all muted tracks and you will see it turn red. Pressing it again will recall your mute previous mute pattern.

This functionality is provided to allow for quick mute and un-mute operations during live play, for instance, and the last selected mute pattern is stored. Therefore, removing all mutes in a page manually, i.e. using the mute buttons directly, will also remove the stored mute pattern and make the MUT LED go off.

Transposing tracks

Remember, we wanted to experiment a bit with a track – let's transpose it. By now you probably know how this works anyway.

Grab the track, turn the PIT knob clockwise, and hear how the track is being transposed up. Shown above is how you would transpose track 3.

Shifting tracks

Now un-mute both tracks – you should hear them play at the same time, on different pitches. You may want to tune them as you learned until you get an acceptable result.

Now grab one of the tracks, and turn the POS knob. This shifts the track forward or backward, depending on your turning direction.

Changing velocity.. and other attributes

To make things a bit more interesting, take one of the two playing tracks and increase its velocity (do we still really need to explain how this works?

You grab the track and turn its velocity encoder clockwise. If your sound source is velocity sensitive you will hear the change instantly.

At this point we encourage you to use what you have learned so far to play and experiment, projecting your knowledge on the other things we haven't describe yet. Why don't you start modifying the Track DIR or GRV and see what happens...

Pausing tracks and step-forwarding

A track may be paused by grabbing the track (holding the appropriate track selector pressed) and pressing the Pause transport button. The procedure applies also to a selection of more than one track.

When a selected track is paused and the Pause button is clicked again, all paused tracks will advance one step but still remain paused.

To un-pause all paused tracks in a page, select one of the paused tracks and press the Play button.

Re-triggering tracks

Tracks may also be re-triggered such as to start playing on the first non-skipped step they contain.

To re-trigger a track simply hold it selected in PAGE mode and press the ALN key. The track will re-trigger immediately and will not be aligned to the master clock.

To do a full realignment press ALN again.

Track chaining

Let's assume for a moment that we are back to having two tracks, with the second one originating from the first, but modified to your taste in the meantime.

If this is not the case, let's reset and reconstruct that scenario. You already know all moves it takes to do that!

Now use the copy and paste functionality to get the "original" pattern on row 9 and the altered pattern on row 8. Clear everything else.

How to do that? Grab the track to be cleared and press the CLR mutator and the track will clear. Alternatively, just for this exercise you may simply mute it, too. Use whatever method you prefer.

So now you should only have two non-empty tracks with no other steps set in the page. For now take a look at the section of the front panel we refer to as the chain selector. You will see that the bottom LED is lit orange, all others are off.

Chain mode selection

Press now the button labeled XXX. The corresponding LED will light orange indicating that this chain mode is selected.

If the sequencer is already running you notice immediately what this means – if the sequencer is not running, you may want to start it now.

Preset chain modes

Basically in this new chain mode you now have pairs of tracks playing sequentially. In our example, you will now first hear Track 9 play, then Track 8. The other tracks will follow this pattern.

Try the other chain options as well – sets of four tracks being played (XXXI) and one long chain of eight tracks being played (XXXII) – for a total of 128 steps in your current page.

User-defined chaining

Finally, you may create any chained track configuration that you like. For example, you can chain the top 4 tracks to build a structure of a total of 64 steps, while leaving the other tracks 16 steps each.

The way to accomplish this is to select the tracks you want to chain and then use the XXVIII button to chain them. We will dig into this a bit deeper as we move along.

Under the hood

For now, take some time to experiment some more, for example change pitch or direction of the tracks.

You will notice that for now chaining is just a matter of playing individual tracks sequentially in a defined order, and does not influence in any way the parameters you have set for the individual tracks.

However, if you are looking to build a continuous structure that spans more than one track, you have to ensure that the parameters of the chained tracks match up as needed.

Details on how to achieve this are described in the corresponding section in the chapter on the Track mode.

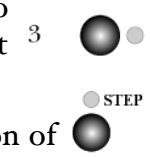
Step real-time entry

There is a simple way to tap steps into a track in real time.

Simply grab the track you would like to tap into – you will notice that the STEP LED in the MODE block turns red.

Step tapping

While the sequencer is playing, tap the STEP key as you go and you will see that the steps under the chase-light get toggled on as you tap.



In fact they are placed into the track at the precise position of the tap, within a 1/192 resolution, trying to reflect to the greatest extent possible what you have entered.

If you are less than satisfied with the results of your play, you may clean up the mess by simply clearing the track as we have already seen before.

Quantization

Sometimes you may want to quantize the entered data. A quick way to do so is available as well, but we would have to jump way ahead of the flow.

If you really want to know, and can't wait, just remember for later that all it takes is to clear the STA map of the track in question.

Or, you may want to set the STA attribute map factor to the lowest possible value, where it will not have any effect on played output and therefore play everything „on the beat".

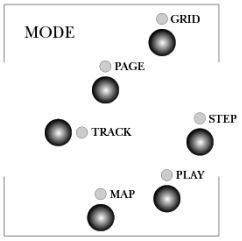
The MODE block

Let's talk a bit about the buttons surrounding the STEP button you have just used – in the MODE block.

There are other buttons in here as well, most of which denote Objects. Their use goes back to the object model hierarchy discussed in the introduction.

Mode block explained

Generally, the MODE block is used to offer both navigation functionality and orientation.



For example, upon power on you will see that Octopus is in PAGE mode (indicated by the blinking PAGE LED), and that you have an option to switch "up" into the GRID mode (lit green).

Navigation

Here in PAGE mode, you may select a track just as we have seen in this chapter, and you will notice that the TRACK LED turns green, indicating that you may go into TRACK mode. Indeed, pressing the TRACK button will take you there.

9 VEL

Similarly, as soon as you select a step in a page (using the SEL button), you will see that the STEP mode may be entered, as the STEP LED is lit green.

Orientation

At any time during operation, you will see a orange LED blink indicating the mode that you are currently in. This is a key navigational landmark, always telling you where you are.

One slight exception to that rule is the PAGE mode. A red light of the PAGE LED indicates that you are in PAGE mode; however that page is currently not playing in the grid.

A green light in the PAGE LED indicates that the page is solo-ed in the grid. A red light in the PLAY LED is showing that PLAY mode is not active – this will be discussed later.

III Step mode

Step mode is the level at which you can inspect and tweak directly step parameters: the Matrix field is dedicated to information about just one step.

Basic operation

Zooming in

Double-click a step. You will see the display in the MODE field switch to STEP mode, shown by the blinking STEP mode LED. It is helpful to think of this as a zoom into the step you double clicked on.

Some explanation is needed for what you now see being displayed. The various rows indicate the current values for the step attributes.

Finding your position

To see which step is being edited, hold the STEP object button down. You will see exactly one blinking matrix LED, in red or in green.

This blinking LED shows the step you have zoomed into. If it is red, it means it is not toggled on, if it is green, it is toggled on.

Gaining control

You may use the TGL key to toggle its status as you like.

As you toggle the step status you see that another LED changes color as well – the LED in row 0 is on when the step is turned on, and off otherwise. The reason is that row 0 is showing the pattern of the track to which the zoomed step belongs.

Moving on

Holding the Step Mode button and pressing any key in the matrix selects the corresponding step into the zoom focus and adapts the display of the POS row according to the track's contents.

Alternatively, if you want to edit a step in the same track, you may press its corresponding button in row 0 (the MCH row) to switch view to that particular step.

This is an easy and fast way to jump from Step to Step directly, without ever leaving the Step mode.

Step attributes

Going over the front panel from left to right, you see all LEDs lit up in the SEL column. We shall explain in a second what this is about.

Step velocity (VEL)

The contents of the VEL row may look familiar – a number is represented here, with the red LEDs counting the tens and the green LED pointing to the ones value. This value may be changed in a more conventional fashion by simply turning the VEL knob.

The step velocity offset may be a positive or negative number. Negative offsets are shown in the same manner as positive offsets, but additionally the 3 LEDs in columns 14-16 are lit green.

Please note that the total velocity of a step is determined by adding the individual step velocity offset to the base Track velocity. This allows a wide range of velocities in a track while still giving you one place (the track velocity) to adjust them all up or down and still maintain the relationships set for each step.

Step pitch (PIT)

As you may expect, the PIT row shows the pitch value for the step.

The number displayed is really an offset that the step applies to the track pitch. The combined pitch of the track and the step is shown in a musical fashion in the inner circle.

Turning the PIT knob will now cause the obvious – it will change the pitch for the step, which you will hear once the step is played.

Just as for velocity, step pitch may be a positive or negative offset relative to the base track pitch. Negative offsets are shown in the same manner as positive offsets, but additionally the 3 LEDs in columns 14-16 are lit green.

Step length (LEN)

The same principles apply to all the other step attribute values in the page, except for the display of their values.

Change the length on the step by turning its LEN knob.
As you increment the value (turning the knob clock-wise) you will see a green dot advancing up to 11 after which the red value will be incremented.

Each green increment corresponds to 1/192 of a note and each red value corresponds to 12/192 = 1/16 of a note.

The minimum step length is 1/192. Decrementing beyond that point will light the last 4 LEDs green. This means that the step is set to legato mode – i.e. no note off MIDI signal will be played for this step.

The natural maximum length of a step is one full note – 192/192. However, Steps have a LEN multiplier, allowing them to play up to 8 times their actual length.

The step LEN multiplier value is in the range 1-8. The step multiplier value is shown (and editable) in STEP mode in the transport area, using the pattern used for track clock multipliers.

The maximum step length is therefore 8 full notes at master clock speed. The multiplier can be adjusted manually, and is computed automatically when recording notes in a track (described in a later section). This allows for recording long-holding notes to a remarkably large degree.

Step start (STA)

This row denotes the start of a step. By default you will see that the STA line is empty.

Turn the STA knob clockwise and you will see a red bar go from left to right – you are just delaying ("pushing") the step – every time by 1/192 of a note. The maximum push is 5/192.

Turn the knob back until you reach the default position, i.e. all LEDs are off. Now turn the knob further back and you see now a green bar growing from right to left starting on position 16 of the row – you are pulling the step to the front of the beat.

The current maximum pull is 5/192. Note that the real effect of this setting is directly dependent on the value of the track STA attribute.

Step amount (AMT)

The next parameter in line would be AMT (amount). We will get into the details later, for now it is enough to mention that this indicates the amount to which an event programmed on this step will affect the current track.

Step phrasing (GRV)

A Step may be enriched at playtime by a certain amount of notes determined by phrases that are pre-programmed into something we call phrases. There are three banks of 16

phrases, for a total of 48. They are roughly covering delays, rhythmic delays and note intervals respectively.

As you turn the GRV encoder to the right you will see the phrase number increase from 1 to 16 (0 means no phrase is selected). Once 16 is reached in a bank, the color of the pointer LED will switch to the next bank, as you can tell from the color.

Step phrase time compression (POS)

The POS value will become visible as soon as a phrase is selected from the pool for the respective step and represents the time compression value for the particular step phrase. A value of 8 is neutral.

Values lower than 8 will speedup the playback of the phrase, while values greater than 8 will slow down the playback.

Step MIDI continuous controller (MCC)

The MCC value represents the amount of MIDI CC sent at this particular step position. This of course only applies when the track is told to do so. More on this in the TRACK view.

MCC

The display uses a decimal representation similar to that used for VEL, with the exception that is has a “void” value, indicated by 4 green LEDs in the last positions of the track. This means that no value is sent out on that track – since 0 would be a valid value for a MIDI continuous controller.

Step mutators

You may have noticed that the mutator column has several LEDs lit up. They are labeled according to the mutator functions that they trigger. A lit up mutator indicates that it is available. Below a quick description of what they do:

Step toggle (TGL)

Press the TGL mutator to turn the selected step on and off.

Step clear (CLR)

Pressing this will recall the preset values for the attributes of the selected step and will also turn the step off, if it was turned on before. The default Step attribute values are:

VEL offset	= 0
PIT offset	= 0
LEN	= 1/16
STA offset	= 0
AMT	= 0
MCC	= none

Step randomize (RND)

This will assign most step attributes random values. The randomization takes place based on the actual Step value and using 50 as randomization amount. The GRV and POS attributes that are not affected by this function.

Step zoom (ZOM)

In STEP mode the LED is lit up in red. Pressing the ZOM key will exit the STEP mode and return you back into the PAGE mode.

Step copy and paste (CPY/PST)

A selected step may be copied using the CPY mutator. To paste it to a different position, you may select the step at the target position and use the PST mutator for the paste operation.

Exiting STEP mode

If you want to exit the STEP mode, you may press ESC anytime to find yourself back in the PAGE mode. Another option is to go back to the PAGE mode by pressing the PAGE mode button in the MODE selector section of the front panel.

Step selections

After having tweaked a step to anything we were looking for, let's assume that we are trying to make parameter changes to a group of steps in the page instead of just a single step. Think of the classic "accent" scenario – where some steps are supposed to play with a greater velocity than the rest.

One way to achieve that would be to use the method we have described, changing the velocity, step after step.

A more elegant way to do it is to use step selections, i.e. first select all the steps you want to accent, and then tweak the VEL knob to accent them.

To do this we first have to switch to Page mode, either by pressing PAGE in the MODE block or simply by pressing ESC.

Step select

In Page mode, press the SEL key and keeping it pressed while pressing the button of the first step to be selected. Note that only active steps may be selected.

You will see that both the SEL LED and the selected step will blink green, indicating the step select status.

You may now add active steps to the step selection by simply pressing them, or remove them from the selection by pressing them again.

Turn up their velocity and you should hear the change immediately. You can now of course change any of the step attributes – the pitch, the length, and the start, anything you would like, by simply turning the knobs.

This method produces a relative change. In other words, increasing the velocity by 10 will add 10 to the current velocity of each selected step. It does not force all selected steps to the same absolute value.

To exit the step selection mode, press the SEL button again. In this case the step selection is remembered for later recall.

Alternatively you may exit by pressing the ESC key to return to normal operation, but here the step selection will not be remembered.

Step selection mutators

When a step selection is active you will notice that some mutators become active – indicated by their lit up LEDs. The set may be different depending on whether you have one or more steps selected.

Single step selection

If a single step is selected using the SEL button, you may notice that the circles are showing the step's velocity and pitch values. This is useful as a reference when you edit the steps velocity and pitch.

IV Track mode

Track mode is the level at which you can inspect and tweak directly track parameters: the Matrix field is dedicated to information about just one track.

Basic operation

The TRACK mode provides similar functionality to the STEP mode for any track and its attributes.

Please note that all the functionality described in the TRACK mode is also reachable from the PAGE mode, as long as a track is selected.

The difference is that TRACK mode provides the finer visual feedback necessary for some of the edit features.

Zooming in

Entering TRACK mode, i.e. zooming into a track from PAGE mode is easy and predictable by now: decide which track you want to zoom into and double click its selector button.

In our example, by double clicking selector number 5 we would zoom into Track number 5. You can get back to PAGE mode by pressing ESC or PAGE.

The display changes to showing some values, using the same convention you have already encountered in the step mode.

Some things are new though. Let's fly briefly over what we see in the case of the default values for Track 5.

Track attributes

Track velocity (VEL) and pitch (PIT)

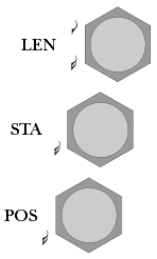
Velocity and pitch values are displayed in the same manner we have seen in STEP mode.

The meaning of the values is interesting – they represent the base value and are to be seen in the context of the values pertaining to the steps in the particular track.

Under the hood

When playing, the values of the steps in that track are added to the base track pitch or velocity. As a consequence, the baseline for a track is set by the track pitch and velocity. Step values are just offsets to this base. Octopus uses the convention that middle C (MIDI note #60 decimal) maps to c5.

Track LEN and STA factors



The Length and Start rows show visually the values for the length and start factors of a track. The STA and LEN factors are simply multipliers that are applied to the STA and LEN offsets of the steps in a track.

This means, that a high factor value will result in the effect of the STA or LEN offsets being amplified, while a low factor value will result in the effect of the step offsets being diminished or voided altogether.

In the middle setting of 8, the effect of the map is unchanged and therefore played "through".

In the zero setting, the STA and LEN step offsets will be ignored altogether, while in the 16 position the step offsets will be amplified by a total factor of roughly 2.

As an example, have a track play some default length notes, and simply turn the LEN knob to the left. You will hear that the note lengths are decreasing as you go, and quite the opposite will happen as you turn the knob to the right.

For the STA factor, use a track with notes playing off the beat (so you hear the effect). Reducing the factor will play the notes closer to the "on the beat" time, effectively quantizing the play, while increasing the factor will move the steps further away from the on the beat position.

On a side not, in order to modify the actual length and start point of a track, use the step skip option.

Track position (POS)

The POS line will show the pattern of set steps in the track at hand.

Turning the POS knob will shift the steps around, depending on the turn direction, modifying the contents of the play window, just to use the same terms.

Track direction (DIR)

This line indicates the chosen play direction for a track. Consider it as an index into the following default mapping:

1 – Forward play

2 – Reverse play

3 – Ping pong

4 – Random order

5 – Brownian, i.e. 2/3 probability forward, 1/3 probability reverse play

6-16 – Same as 1, however: the track play directions 6-16 may also be individually edited and changed as needed. For details on user-defined directions please refer to the dedicated section in this manual.

Track amount (AMT)

AMT represents the amount of randomization applied to the track when the RND function is called.

Track groove (GRV)

The GRV value determines how much shuffle is applied to the track – the range is 0 - 16.

Shuffle means that the steps with an even index in the track (i.e. 2, 4, 6 ... 16) will be played with a delay. Generally, the larger the GRV amount, the longer the delay that makes up the shuffle.

One other intricacy is that the odd GRV values will produce steady shuffle delays, while the even GRV values will produce delays that are variable within one 1/192 and which are determined at runtime. The delay values applied are as follows:

Setting	Delay (1/192)
1	1
2	0-2
3	2
4	1-3
5	3
6	2-4
7	4
8	3-5
9	5
10	4-6
11	6
12	5-7
13	7
14	6-8
15	8
16	7-9

Track MIDI continuous controller (MCC)

The MCC row determines whether or not this track sends MCC. The "none" flag is represented as four green LEDs in the positions 13-16. The value range here is of course 0-127 and please keep in mind that a value of 0 does indicate a valid controller value.

Two exception are the BENDER and CHANNEL PRESSURE flags.

The BENDER flag is shown as a red dot in position 16 of the MCC row and is indicating that the track will be sending MIDI pitch bend messages according to the MCC values stored in that track's steps.

The CHANNEL PRESSURE flag is indicated by two red dots in the positions 15 and 16 of the MCC row, and is telling us that the track

will be sending CHANNEL PRESSURE messages according to the MCC values stored in that track's steps.

If a track has an MCC parameter value other than "none" (i.e. the 4 green LEDs in the positions 13-16), its chase light color in the matrix will be orange, while the tracks whose MCC values are set to "none" have a red chase light.

Track MIDI channel (MCH)

The MCH row indicates the MIDI channel for this track. Default value for all tracks is channel 1 on port 1. This is represented by a green light in the 1 position.

Now turn the MCH rotary encoder slowly to the right until you reach 16. Turning it once more to the right will light the LED in position 1 red. This means that channel 1 on port 2 is now selected. Therefore green 1-16 assigns a track to MIDI port 1, red 1-16 to MIDI port 2.

While you are choosing the right MIDI channel for your track, be sure that the numeric representation is a solid green or red, and not a blinking one. Blinking representations are related to virtual MIDI channels, covered in a separate section.

Track data direct entry

Most of the parameter values in the TRACK mode may also be keyed in using the matrix buttons. Typically a single click will move the ones value to the pressed value, a double click will set the ones value to zero and move the tens value to the double clicked value.

Track pitch direct entry

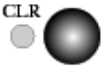
You may have noticed that the pitch value is also indicated in the pitch inner circle on the right hand side, as you change it and otherwise. Pressing the upper C key in the circle will transpose the track one octave up; pressing the low C key will first transpose it to the C, then one octave down.

Track mutators

You may have noticed that the mutator column has several LEDs lit up. They are labeled according to the mutator functions that they trigger.

Signaling

A lit up mutator indicates that it is available. Please note that all mutator functions described here are also available from the PAGE mode, as soon as a track is selected.

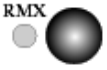


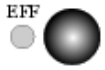
Track toggle (TGL)

This simply toggles the track on or off. It is equivalent to muting or un-muting the track when in PAGE mode.

Track solo (SOL)

Pressing the SOL button solo's the track within its page. Note that no other pages playing concurrently will be affected. Pressing it again will un-solo the track in the page.



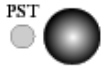


Track clear (CLR)

CLR will recall the preset values for the selected track. Only the MIDI Channel assignment (MCH) will remain unchanged.

The pitch is set to the default value of 60. Note that the factory pitch assignment can be recalled by calling the CLR mutator upon a PAGE. If you are at the PAGE level and grab a Track and clear it, everything is reset.

Track randomize (RND)



This will create a random step pattern in the track, not affecting the other parameters in the track.

Track FLAT (FLT)

The FLT function is used mainly to combine the pitch content of several tracks into just one track in the same

page.

This function was conceived as a creative tool and not as a track space-saving feature, as it may appear at first sight. In some instances it may be useful as such, but just in some. Please keep this in mind!

FLT will only become available when you have selected two or more tracks in a page. There is a notion of a destination track, which is always the one from the selection with the lowest index.

Applying FLT to the track selection will fill the destination track with content from the source tracks.

For every active step in any of the source tracks, you will get the corresponding step activated in the target track. Skipped steps will simply be ignored.

If more than one step is active in the same column across the selected tracks, the lowest 7 pitches of active steps will get stacked to form a chord on the respective step in the destination track.

Note that if source track steps contain chords already, only their base pitch will be considered for FLT. The additional chord data in the source tracks will be ignored.

The base pitch of the resulting chord will be the lowest pitch encountered in the respective column, with the other found pitches being stacked on top.

Another detail worth mentioning is the influence of FLT on the VEL, LEN and STA values of the steps in the destination track. FLT always carries over the VEL, LEN and STA attributes of the last encountered active step for a particular column/position inside the destination track.

Also something to realize is that FLT is MIDI channel agnostic – you may FLT different tracks playing on different channels, but the result will always play on the MIDI channel of the destination track.

With that in mind, let us suggest two best practice usage methods for FLT. Firstly, before you are applying FLT to your track selection, make sure the target track is muted.

This way you do not get any double notes playing if the target track is set to the same MIDI channel as any source tracks. You then can do a smooth blend-in of the new material, which may be useful when playing live for example.

Secondly, you may want to make sure the target track MIDI channel is different from any of the source tracks before you apply FLT. This will effect the obvious – the new material is going to sound fresh right away. And of course you can use both of these techniques combined to achieve the result that is best for you!

Track remixes (RMX)

The track remix is used to generate variations of a track without altering it too much. It does have some random elements which are influenced by the value indicated in AMT.

Below is an overview of what the RMX function does:

Influenced map*	Random map shift	Random step offset
VEL	+	+
PIT	+	
LEN	+	+
STA	+	+
POS	+	

**see section on track attribute maps for details on what this means.*

Track zoom (ZOM)

The ZOM key is used to zoom into and out of certain views – in this case it would zoom out of the Track mode and back into the Page mode. The fact that you are zooming out is indicated by a red LED light, as opposed to a orange one.

When in page mode, hold one track selector down and press ZOM to zoom into the track – this has the same effect as a double click on the track selector. We will talk a bit more about the ZOM mutator when we describe the MAP mode.

Track Copy and Paste

Copying and pasting tracks has already been described earlier.

A track is selected and copied into an internal clipboard and from there pasted into the chosen destination.

Track selections

Sometimes it may be convenient to make a change to more than one track at once. This can be done easily using the same method you have already seen in the STEP chapter.

Creating track selections

Make sure you are in PAGE mode. Hold down SEL and then press the selectors of the tracks you would like to add to your selection.

The track selection you have just created will stay active for EDIT operations until you press the SEL button again.

Also, while the selection is active, you may toggle tracks into and out of the selection.

Track selection recall

With a track selection active, once you press the SEL button the selection will be de-activated and the SEL button turns red, indicating that there is a selection that may be recalled.

Generally, SEL will store the last track selection you have made. Pressing SEL again will bring back your previous selection.

Shortcuts

There is also a quick way to select all tracks in a page at once – simply double click on the SEL key – you will see the full column of SEL LEDs light up.

Track chaining

Track chains explained

A track chain is simply a defined sequence of playing tracks from a page, in a given consecutive order. Track chains are always configured in PAGE mode and are useful in creating structures longer than 16 steps per page.

Playing considerations

Chain configurations may or may not influence the set track parameters. Each track can be played as it is, or each track's steps may be played using the same set of track parameters as its base.

While the preset chain modes were covered in the start-up section, we shall now look closer at flexible track chain configurations.

Selecting chain members

While in PAGE mode, define first the group of tracks that you would like to chain by creating an appropriate selection.

Creating a track chain

While the selection is active (blinking orange), press the XXVIII button to build the chain made up by these tracks.

You will now see that they start playing in sequence. The play sequence is per default top to bottom (i.e. row 9 to row 0).

There are cases when you will see this order changed as a result of some more interaction with the chain structures inside a page. This has to do with the way a chain is defined internally.

Under the hood

Every chain has a head and a tail. The head is a track, while the tail may be made of none, one or more other tracks.

When you create a selection, the top track of a selection will be defined as the head of the new chain, and the other selected tracks will make up the tail.

Should any of the newly chained tracks have been part of a chain before (regardless if head or tail); they will be removed from their original chain(s) and added to the new one. The original chains will simply get reduced by the tracks re-allocated to the new chain.

Showing track chains

Once a track chain has been created, you can also easily see how it is spread across the page.

Simply select a track that is part of a chain, and you should see the following information in the selector LED column.

The track selected (one you have your finger on) is blinking orange.

Other track members may be lit green and red. In red you can recognize the head track of the chain, in green the other chain members that are not the head.

If the head and the selected track are the same, you will only see a blinking orange LED.

What about preset chains?

By now you may wonder, what about the preset chain configurations on offer? Well, they are nothing more that preset chain configurations with shortcut buttons.

Track base switch

You can switch the track base of a chain from using individual track base values to using the track base values of the head track.

Simply toggle the chain selection indicator between orange and red. orange means that tracks are being played in their natural state but in chained order.

Red means that the tracks will be played taking over the values held in the head track as a base reference.

Note that this switch will work equally for preset and custom chain configurations.

Muting chained tracks

One more thing to mention about the track base for a chain - in the context of muting or un-muting tracks that are actually part of a chain. If the chain head is the base of the chain, then the mute operation of any chain members will apply to all tracks in that chain. Note that it will be a toggle operation, so it will invert the mute pattern of the set of chained tracks.

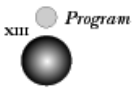
Track program changes

MIDI program change

In Track mode, you may have noticed that the Program LED is lit in orange and the Select LED next to it is lit in green. Also, the numeric field is not showing the global tempo value anymore, as it does in the PAGE mode.

We are using that area to edit and send MIDI program changes to the channel of the selected track.

First, select the MIDI channel you would like to send the program change on as the track MIDI channel.



Next, dial in a program number, using the rotary encoder on the top right. Alternatively, you may want to key in the number of the program you want to select. Once selected, press Program and you should hear / see the program change occur.

A couple of side notes are necessary here. First, consider that not all synthesizer manufacturers use the same numbering scheme for their programs, i.e. some start counting at 1, some at 0. However, the underlying values are always in the range 0-127.

The Octopus convention is to display values in the range 0-128, where a value of 0 means that no program change message is sent. Therefore, the program changes are numbered in the range 1-128.

Secondly, a program change message will be sent every time the Program key is pressed in TRACK mode, regardless of all other circumstances.

However, if you keep the Program key pressed while turning the knob, the program change messages will get sent as you increase or decrease the PC number via the main knob.

Furthermore, all program changes contained in the tracks of a page will be sent (once) as soon as that page is enabled for play – either as part of a cluster, or by manual intervention.

MIDI bank changes

You can also issue bank change messages. This is done simply by pressing the Select button and turning it orange.

In that case the number displayed will correspond to the bank number, and the bank change message will get sent as soon as you press the Select button again.

Bank change messages will be sent also when a page is activated for play, but not when you send program change messages from Track mode.

Track tempo multipliers

To change a track's tempo multiplier, go to Track mode, and use the play buttons with one, two or four triangles in the transport bar.

For example, by double clicking on the >> and >>>> buttons, the tempo will be set to ½ and ¼ respectively of the master tempo.

The table below shows the available multipliers and the key press combinations needed to get to them.

Multiplier	Hold	Click	Double-click
1		>	
1,5	>>	>	
2		>>	
3	>	>>	
4		>>>>	
5	>	>>>>	
6	>>	>>>>	
7	> >>	>>>>	
8	>>>>	>>	
16	>> >>>>	>	
1 / 1,5	>>		>
1/2			>>
1/3	>		>>
1/4			>>>>
1/5	>		>>>>
1/6	>>		>>>>
1/7	>		>>>>
1/8	>>>>		>>
1/16	>> >>>>		>

The values selected for a track are indicated as follows: In general, red dots denote multipliers and green dots denote divisors of the cardinality.

For example, having the LEDs of and lit green at the same time denotes a divisor of 5, meaning a track multiplier of 1/5.

Exceptions to the rule include the 1.5, 1/1.5, 8, 1/8, 16 and 1/16 multipliers, covered below.

The 1.5 multiplier is, as it may be obvious already, essential for easy triplet creation - a triplet being three notes played instead of two.

It is shown as a orange 2 and a red 1. Its inverse, the 1/1.5 multiplier, is shown as a orange 2 and a green 1.

The 8 multiplier is shown as a orange 4 and a red 2 LED. 1/8 is shown as a orange 4 and a green 2.

The 16 multiplier is shown as orange 4 and 2 plus a red 1, and 1/16 is indicated as a orange 4 and 2 and a green one.

Please note that during play, switching the clock multiplier is effective immediately with no quantization with regard to the master tempo.

Realignment of the tracks may always be done by using the ALN functionality available.

Note that when the sequencer is playing, the changes of the track clock multiplier are effective on the next 1/16th beat of the master clock and not immediately.

This provides better track alignment and improves the general feel of the sequence without the need to explicitly align after a track clock switch.

Track auxiliaries

Track chase-light

If you are in Track mode while the sequencer is playing, you will notice a chase-light in the row belonging to the track that you are editing. This is just to help your orientation.

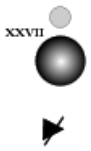
Track view switch

Let's assume you have now edited a track's parameters and now would like to adapt another track's parameters to some change you have made. One way is to use ESC or PAGE to exit the track mode and zoom into the new track as you have seen it before.

A much quicker way is to click in any direction the MIX knob corresponding to the new track, in our example track 6. The display will instantly switch to showing parameters of track 6.

This function is particularly useful when you are dealing with chained tracks, where some change in a track may directly imply that the next track in chain will have to change as well.

Track follow



There is also an automated way of switching the track in the view – that is the FOLLOW mode.

When Follow is active and you are zoomed into a track that is part of a chain, the view will always follow the chase light in the respective track chain, in the sense that it will always show the track that is currently played by the chase-light.

Activate Follow by pressing the green follow button to turn it red. Deactivate Follow by toggling it back to green.

Track chord stacks

The steps of a track may be stacked with pitches from a selected scale. To select a scale please follow the instruction in the section describing the scale mode.

The CHORD stack indicator shows how many notes the stack will contain. Using the example of a three note chord on a track containing steps all in C and a selected scale of C major, we would now have the track play on each set step a chord of C-E-G. This assignment is fixed for all notes on the track.

However, a step that is set to play a chord (see section on step chords) will not be influenced by the track chord stack. In other words, the track chord stack will be overruled by step chord settings.

V Page mode

Page mode is the level at which you play Octopus in the step sequencer traditional way: the Matrix field is now a field of 10 tracks and 160 steps, waiting to be played!

Basic operation

We have all along used the page mode as a starting point, from where we have been zooming into the other elements, notably tracks and steps so far. It is time to take a closer look at what else is going on in the PAGE mode itself.

By holding down the PAGE button in the Mode block, generally all pages that contain data will be displayed with either green or red LEDs in the matrix.

Exactly one of them will blink orange, pointing out to you the grid position of the page you are currently in. Please refer to the introductory chapter on general concepts to get an overall view of what the grid is.

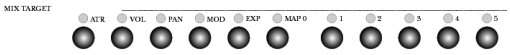
This function is a useful navigation tool, showing you not only what else is going on in the grid, but also where you are currently with regard to some other content in the grid.

The Mixer block

In the previous sections we have talked to a large extent about what the EDITOR block does – in short, it is used to change the attributes of a selected entity, where applicable.

The main task of the MIXER block, on the other hand, is to change a particular parameter of the tracks corresponding to each of the knobs. The parameter that is changed can be selected directly, using the MIX TARGET button set – right below the matrix field.

While in PAGE mode, you will see that one of the MIX target LEDs at the bottom of the matrix is lit - possibly ATR, since this is the default setting and you probably have not changed it until now.



Viewing the MIX map

Double click the ATR button. This brings you to the MIX TARGET assignment, where a parameter can be assigned to the MIX encoder group.

The Mix Target LEDs light all up, indicating the selected target in blinking orange. Also, the matrix is showing in every row the value respective to the corresponding track for the chosen attribute.

This type of display is called a MIX map, showing the behavior of the tracks with respect to a particular attribute, which can be adjusted using the MIX encoder block.

As a matter of fact, clicking on any of the MIX target buttons will open a MIX map view, with the respective values showing, and ready to edit. We will describe this in the next sections in more detail.

Mix attribute quick assign

A very quick way to assign an attribute to the MIXER BLOCK is to select the attribute (i.e. to select GRV, press and hold the selector of row 2), while pressing the MIX button. Or vice versa – hold the MIX button pressed and press the track selector corresponding to the wanted attribute.

By pressing the MIX button you will notice that the selected attribute has been changed – the current selected mix attribute is blinking orange in the selector column.

Working with Mix maps

While viewing MIX maps, you can work with a particular track attribute value directly, for all tracks at once. You may tweak the value of any one track, or apply some functions to all tracks in the page.

Clear

Clear the MIX map using the CLR button – this will reset the MIX map to default values for each track in the page, all at once.

Randomize

You may randomize the displayed values using the RND button. This will assign random values to all tracks at once – for the selected attribute of course.

Align

Using the ALN function you may re-order the tracks in the page, sorting them in the page by the values of the selected MIX MAP attribute. The sorting will be done such that the track with the highest value will be placed on the top row. Try it out!

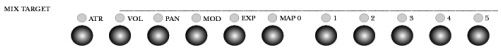
Copy / Paste

Finally, if you have composed a page whose MIX map you would like to replicate, you may use the CPY / PST functionality to replicate that attribute assignment across the tracks.

For example, assuming you have a page whose pitch structure creates a certain mood or harmony; you can apply the same mood to an entirely unrelated page or pattern, by simply copying the PIT map from one page to the other.

Mix map targets

Going back to editing, there are three classes of targets: attributes (ATR), preset MIDI CC's (any of VOL, PAN, MOD, EXP), and MIDI Control Maps (MAP 0-5). Some explaining is due here.



Attributes

If the ATR type is selected by a double click, the SEL buttons will light up green, indicating that any of them may be selected. The already selected attribute will blink orange.

The matrix will show the value relevant for the respective rows.

All rotary knobs act upon the same attribute on their respective track. For example if PIT (pitch) is selected, every rotary will change the pitch of its assigned row.

Preset MIDI CC's

The MIDI CC's behave the same as the ATR targets. The CC's used are: VOL (7), PAN (10), MOD (1), EXP (11).

MIDI Control Maps

Using a MIDI Controller Map, any MIX knob can be assigned an individual CC on a chosen MIDI channel.

As an example, double click on MAP 0 to select MIDI Controller Map 0. You will notice that the AMT button will blink orange indicated that AMT is selected. The matrix shows the per-track AMT values, which is really the CC amount set on each of the tracks.

Press the MCC button. Here the Matrix shows the actual Midi Continuous Controller assigned to each of the tracks.

You can modify the CC for every individual track using the MIX knobs. Remember that four green LEDs in positions 13, 14, 15, and 16 indicate that no CC has been assigned.

Now press the MCH button. This view allows you to assign the MIDI channel on which the CC signal is sent.

Note that this is not the MIDI channel of the Track – the track's MIDI channel is an entirely independent parameter.

Finally, the settings that you have just made are stored as a MIDI Controller Map. There is a total of 6 MIDI Controller Maps, and

they are global. This is useful because you can have MIDI map operate beyond the context of a page, as they fulfill a global function.

Playing MIDI Controller Maps

MIDI Controller Maps may be edited and operated directly from both the GRID and the PAGE level.

Select one of the MIDI Controller Maps, 0-5. You will see that the LED for the corresponding map is lit orange to show that it is currently active.

Timeout

The MIXER block may be used at any time during PAGE mode operation. In order to make the effects visible, once you operate any of the MIX encoders in PAGE mode you will see its value displayed briefly in the corresponding matrix row.

The value will disappear shortly after you have performed the last click, to clear the view for the regular contents of the track.

EDIT state

Octopus provides a quick way of previewing steps, in the sense that you can immediately hear what they contain, and how they would play under the chase-light.

This is particularly interesting of course when you are tweaking something to sound just right.

By default, in PAGE mode the EDIT LED button lights steady green. Click on it once to toggle it to blinking orange.

When the EDIT LED is lit steady green, everything behaves as you know it: the step buttons toggle the step states. When turned to blinking orange you are in the EDIT state.

To return to the default state (steady green), press the EDIT button twice (again - twice, and not double-click!).

Editing Steps

First make sure the EDIT LED is orange.

Now press some buttons in the matrix. You will notice that no steps will be set (as we have done it before), but that the MIDI data of the steps is played out of the MIDI port as it is.

Grab a step and now tweak its attributes, for example pitch, to take the most obvious one: you will hear that with every click of the encoder the steps is re-triggered and played such that you can hear the change in real time.

The step velocity is shown and editable in the numeric quadrant of the outer circle, the pitch in the inner circle.

The step length may also be adjusted in the matrix, by pressing another button at a distance to denote the length in 1/16th intervals.

Editing Tracks

Pressing the track selectors in preview mode will produce a result similar to the steps buttons.

The note played will basically reveal the tracks velocity and pitch settings, producing a result equivalent to having a non-modified step playing in that track.

EDIT PERFORM state

An alternative and quite rewarding mode of working with a step sequence (depending on your style and preference) is that of tweaking a set sequence of steps in realtime, while the sequence keeps playing. You can also do this to some degree without a special mode, but EDIT PERFORM takes this to perfection.

EDIT PERFORM is actually similar to the EDIT state, with the exception that no MIDI data is transmitted when you operate on the matrix. This is particularly interesting for the Berlin School type of performances.

By default, in PAGE mode the EDIT LED button lights green. Click on it once to toggle it to blinking orange, and once more to make it blink green.

EDIT

Again, when the EDIT LED lights steady green, everything behaves as you know it: the step buttons toggle the step states. When EDIT blinks orange you are in EDIT mode, and when EDIT blinks green you are in EDIT PERFORM mode.

Editor ATR state

In Page mode, an ATR may be temporarily assigned to the EDIT knob group.

Engage

This is done by holding the selector of the respective attribute to select the attribute, and at the same time pressing the EDIT master button to make the actual assignment. The indicator for the Knob group will light orange, indicating activity.

In this mode the EDIT knobs will behave just like another group of MIX knobs for the just selected attribute.

Disengage

Pressing the EDIT master button once will cancel the assignment and return to the legacy mode of operation.

Editor MCC state

The EDIT button has one more state – that is the MCC send state. This is used to make the editor knobs send MCC data.

Sending MCC data

The MCC amounts sent will be on the MIDI channel and controller chosen in their corresponding tracks. See section on Track Attributes if you don't remember the details for setting up Track MIDI CCs.

Engage

To activate the MCC state, double-click on the EDIT button turning it red.

Disengage

To deactivate the MCC state, just press the EDIT button once.

Page mutator functions

When in PAGE mode, holding the PAGE key pressed will make some mutator functions available for the page itself – the expected results should be quite obvious. Applying them is a matter of pressing the appropriate mutator button.

TGL

Pressing TGL will toggle the page play status in the grid.

SOL

Page will be solo-ed and un-solo-ed. When solo-ed, the Page LED in the circle will blink green as opposed to orange

CLR

Using CLR on a page will reset the page to the default page values, including resetting the tracks to their forward moving direction.

RND

This will fill the page with random step patterns on all tracks. Note that the track attributes are not affected, just the step patterns.

RMX

All tracks in the page will be applied the RMX function. See track mode for details.

CPY

Page can be copied to the copy buffer. The copy operation will include the chain configuration local to the page at the time of copy.

PST

Copy buffer will be pasted into the present page position.

Page POSITION in GRID

Another function available is jumping to another page of the grid. As you press the PAGE key you will notice a orange LED blink in the Matrix. This indicates the position of the current page in the grid.

Switching pages

Holding PAGE pressed and pressing a matrix key other than the one blinking and in any row other than row 0 will take you directly to the page associated with that key in the grid.

This is especially useful when you are working on musical structures spanning several pages.

Bank view

When in PAGE mode, by default you see a green lit Select LED in the top right quadrant of the circle, along with the orange Tempo LED.

They indicate the two available modes for the main knob and the numeric field: one of them (default one) is to show master tempo in the numeric filed of the circle, the other one is what we call the bank view.

A bank is the set of 16 pages that live on the same Grid row, and which are mutually exclusive at playtime, meaning that only one page may play per bank, at any time.

Entering bank view

Pressing Select will allow you to see in the numeric field the banks that are currently playing (i.e. contain a playing page) as green lit buttons.

The orange blinking one is the bank currently in your matrix editor.

Note that this says nothing about which column in the bank is currently playing, as a bank only says something about the Grid row that a page resides on.

Pressing any of the green lit buttons will take you directly to the currently playing page in that bank.

Turning the main knob will incrementally take you through the playing pages.

Exiting bank view

Press the Tempo button to return to the standard Tempo display.

Play mode

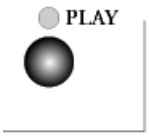
The PLAY mode provides the capability to try new things in a page, in a non-destructive manner.

Activating the PLAY mode is equivalent to taking a snapshot of the currently playing page in a bank for later recall, in case the results of your editing do not live up to your expectations. Notably, the play mode snapshots include track mute patterns of the respective pages.

Also note that engaging the PLAY mode may be done from both page mode and from grid mode.

Engaging play mode

To activate the PLAY mode press the green PLAY button in the MODE block and you should see it blink orange. Also you will notice that the Program button will be lit red.



Now make all the changes and editing that you need to make to your page until you reach a point of satisfaction, or possibly slight regret.

Make changes permanent

To keep the page, simply press Program to make the changes permanent.

Discard changes

To discard the changes, press PLAY again, exiting the PLAY mode and recalling the state of the page from just before you started.

Note that upon stopping the sequencer you will also lose any changes made during PLAY mode.

VI Grid mode

Grid mode is the level at which you control at large amount of MIDI data at once: the Matrix field now gives you instant access to 144 pages!

Basic operation

The GRID mode will typically be the mode used for controlling a large amount of sequence data at once.

For example, sets of active pages can be stored and recalled using the page set snapshot feature, together with the function of saving the full instrument state for recall even after a power off or reset cycle.

Entering Grid mode

To enter the GRID mode simply press the green lit GRID button in the MODE selector section of the front panel.

Now start the sequencer. You should see the note inner circle being filled up with a progress bar.

Global master clock

This progress bar really indicates the position of something you may think of as the global master clock of Octopus.

This clock runs through a cycle of 16 steps after which it starts over. This is the lowest-level Octopus clock and the only interaction you have with it is when you change the master tempo.

Where are you from?

As a simple reference and reminder as to which page you came from into the GRID, you may press the PAGE button in the MODE block and you should see a orange blinking light at the respective position.

Note that this shows something you can think of as the “page in focus”, which changes however as soon as you start operating on pages from the GRID mode, as we shall see described in this chapter.

Page operations

In GRID mode, you are looking at all your pages at a glance: every button in rows 1-9 represents a page, and the LEDs indicate the status of the pages.

A notion we introduced earlier is that of banks: a bank is the set of pages which exist in the same Grid row, and who may play in a mutually exclusive way - i.e. at most one page per bank will play at any given time.

Matrix representation

OFF means the page is empty, green means the page has some content and is playing, red means the page does have some content and is not playing.

Later on you will get into the situation where page LEDs may turn orange, indicating that the page is queued up for play.

Grid EDIT and live modes

Furthermore, you should take quick notice of the EDIT LED. It should light orange to indicate that we are currently operating in Grid EDIT mode. By the end of this chapter we will have seen the Grid live mode as well. Let's stay focused on what we have, for a moment..

Zooming into pages

You will see that the ESC LED is lit up in GRID mode. This may be a quick way to return to the page you just came from – assuming it is still the page in focus, i.e. the last page that was operated on from the grid mode, or the one we have just zoomed out of.

In order to get back into a page, any page, you would either double click on the button corresponding to a page, or simply select the page by holding down the PAGE mode button and then pressing the page.

Alternatively you may also press the ZOM button while pressing the page button. What you finally choose is really up to your personal style and workflow.

Page considerations

By telling you how to leave the GRID mode, we have already given away a lot about how to work with pages in the GRID; hopefully just

as you would expect. The key principle here is to grab and operate, but this should be no surprise this far.

After zooming into the page as indicated above, you enter Page mode. If the PAGE mode LED is flashing red, the selected page is not active, i.e. it is not playing in the Grid. To make it play, hold the PAGE button and press TGL to make it active.

Page clusters

So far we have only played pages one by one. There is a way to make pages play consecutively; this allows you to create structures longer than one page alone has to offer.

Building clusters

In order to play two or more pages consecutively they have to be situated next to each other in the GRID. You can achieve this easily by using CPY / PST / CLR mutator functions in order to create what we shall call page clusters.

A page cluster is therefore a group of two or more adjacent pages surrounded by either empty pages or grid margins.

Cluster activation

Create a page cluster consisting of three pages in a row of your choice. Once the cluster is built, make sure the sequencer is playing and toggle one of the pages in the cluster to green (i.e. make it play). The page will keep on playing.

Activate cluster play for the row in which the cluster exists by pressing the SEL button of that row once – toggling it from red to green. When green, you will notice that once the currently playing page is finished playing the next page in the cluster starts to play and so forth.

Clustering side notes

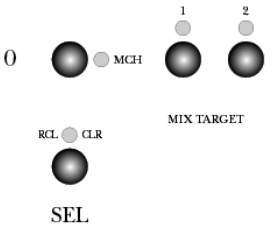
In total you may set up to 16 pages for consecutive play (maximum size of a cluster).

Assuming that all pages have all their tracks chained up (10 tracks per page) this means we get a total of 160 x 16 = 2560 steps playing consecutively.

Add to that the capability of allowing any page to be repeated up to 16 times – let's look at that next.

Page play parameters

Page repeats (STA)



Page clustering can become even more fun, as you can set the number of repetitions individually for each page. For example, page A can play 4 times, page B 2 times and page C 1 time. The number of repetitions can be any value between 1 and 16, where 1 is the default value.

In order to set the repetition value for a page, simply keep it pressed and select the number of repetitions in row 0 – for any number between 1 and 16. You may press on a page's key and you will see the repetitions value along with the currently left number of repetitions for play.

Another way of modifying a page's number of repeats is to hold the page in the grid, while turning the STA knob in the edit block.

Page length (LEN)

When pages play, they are set per default to play 16 step positions, after which they play another 16 steps and so on. These rather natural sixteen 16th positions make up what we call the length of the page, i.e. how many positions until the track "wraps around".

However this value may be changed to a number higher or lower than the natural 16. For example, assuming length 12 for a modified page playing along with a reference page with length 16, the modified page will play its first 12 positions, after which it will play once more its first 4 positions. After that it will start over from position 1 and so on.

Let's see briefly how this may be used: As we have seen, clustering pages is a way to create structures spanning more than one page. If you have worked with pages that contain tracks of different lengths and had these be part of clusters, you may have wondered what determines the moment of switching from one page to the next.

To set the page length of a page, make sure you are in GRID mode, and from there press and hold the button of the page whose length you want to read or modify. When pressing the page button, notice that the SEL LED in row 0 will be lit and can be pressed to change colors between red and green. Make sure to set it to green.

The default is a red LED in the first position of row zero. This indicates that the page is playing a full 16-step cycle. In order to change that, use the row zero buttons and click / double-click them to achieve the desired result. Note that the maximum length of a page can be set up to be 8 cycles, or 128 step lengths.

Note that to create a page length of less than 16, you need to double-click the 1 LED to turn it off, then single click on the keys 1 to 15.

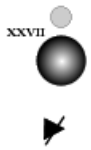
Another way of modifying a page's length is to hold the page while turning the LEN knob in the edit block. Simple as that!

One final remark on page length: a value less than 16 (a full note cycle) will re-trigger the page after every time the page has finished playing its designated length. LEN values of 16 positions and higher will not re-trigger the page, allowing you to create longer-evolving structures.

Page follow

At any time during play in GRID mode you may zoom into any page you would like by the methods described already.

If the page is part of a cluster and some page in the cluster other than the zoomed one is playing, you may want to see the position of the chase-light in the cluster.



Press the green Follow key to enable the follow page function, turning it red. You will notice that the matrix display will always switch to the page that is currently playing, essentially following the chase-light as it moves forward through the pages of the current bank.

This is particularly useful when you are working on structures longer than one page. Pressing the Follow button again will freeze the view on the page currently showing.

An easy way to remember the color coding could be:

Red: stick to the red chase-light, green: stick to the green steps.

VII Performance tools

This section presents some tools that are especially useful in performance situations, allowing for unmatched freedom in your workflow!

Working with pages

This section is assuming we are working in the GRID mode, where we have control over the behavior of individual pages. Please switch to GRID mode if you are not there already.

The Matrix field keys in rows 1-9 represent pages. At any given time, only one page in every row (bank) can be playing. So there may be up to 90 tracks playing concurrently.

Page activation

In order to activate a page for play you just hold it pressed and press TGL. Repeat the procedure to make it not play any longer.

TGL will have an effect on a page only if the page is not empty (i.e. lights red or green).

When you grab a page, you will also see that there is a set of mutators available for the page. Their semantics is very similar to that of tracks. You may want to experiment a bit without knowing too much about the details of their implementation. For the time being just make sure the page you are working on is also playing.

Page mutators

SOL

Will solo the page in the entire grid – pressing SOL again will un-solo it. Only one page can be in solo mode at any one time.

Groups of pages playing concurrently are handled by the page sets feature described below.

CLR

Will rest the page to default, so make sure you are not calling CLR on a page whose contents you would rather keep.

RND

Will randomize the contents of the selected page, giving a good playground to inspire you.

RMX

Will call the Remix mutator function on each of the page's tracks.

ZOM

We have looked at already – it takes you into the page in question.

CPY

This will copy the page to an internal buffer for later PST operations. Once a CPY operation has taken place you will see that the PST operation becomes available.

For convenience (explicitly and consciously against consistency), holding the PAGE MODE button in GRID mode and pressing the button of a page in the grid will zoom into that page.

Page transposition

When a page is selected in the grid, you may notice that the pitch circle lights up. It indicates the page's pitch offset and lets you modify it, in order to transpose the entire page content in one place. Alternatively you may use the PIT encoder to adjust it as well.

To transpose the page by one full octave respectively, you may use the High C and Low C keys in the circle.

Page velocity (VEL) factor

Similar to the factors we see in conjunction with the track attribute maps, there is a page velocity factor that may be adjusted from the grid mode. The page velocity factor is a master determinant of the velocity produced by note content in a particular page. Assuming the patch on your sound source is velocity sensitive, you should be able to easily create fade-ins and fade-outs using this functionality.

Select a page in the grid, and while selected, turn the VEL encoder. The numeric quadrant of the outer circle will display the factor value.

Page switch modes

When switching pages in and out of the grid you will usually want them to start playing right on the beat – and they will (provided the progress bar of the master clock is lit red).

Immediate switching

You may also choose to have toggled pages start and stop immediately as you operate the TGL button. For that you have to make sure that the master clock progress bar is lit green.

To toggle between red and green you just press the Tempo button at the top right of the outer circle and you should see the color of the master clock progress bar change accordingly.

In summary, there are two page switch modes, which we call “o’clock” and “immediate”. To toggle between them simply press the Tempo button. O’clock is denoted by a red master clock indicator, immediate by a green one.

Realigning pages

When operating in the direct toggle mode (green progress bar) it is easy to get pages to play out of sync. In order to get them all aligned back to the master clock you can press the ALN button, like you did for tracks inside a page, earlier on.

Grid mode page mutes

In GRID mode, when no page is grabbed (i.e. held down), the mutator buttons take on a similar role to the one that the main MUT button has in PAGE mode - that is, toggle between a stored track mute pattern and back, in the page that is momentarily playing in the GRID.

As such, the colors of the LEDs should become clear: an unlit LED means there is no page playing, or the page does not have a mute pattern - neither stored nor active.

A green LED means there is a stored mute pattern that may be activated, and a red LED means that there is a mute pattern active in the page.

Finally, pressing the main MUT button will toggle all mutators, i.e. all green ones will be turned red, and vice versa, with the implications already described above.

Grid live mode

As mentioned earlier in the Page operations section, the page operations you have learned so far were part of the EDIT mode. As the name suggests, this mode is suited for applications where you work with the material in an editing sense.

The Grid live mode is more suited in the cases where you are playing your material live, hence the name. In Grid live mode the matrix buttons will act as toggles for the respective pages. This provides more immediate and intuitive handling of material in live situations.

Switching to Grid live mode is quite easy: make sure the EDIT LED is off. If it is lit orange (default state) press it once to turn it off.

Operating in Grid live mode is easily explained. In principle, the page buttons now act as page toggles, much similar to the way things work in page mode, where buttons act as step toggles. Confused?

Pressing a page button that is red (page is not playing), will turn that page on. Pressing the button of a playing page (green) will turn that page off.

Bank mute toggles

In GRID mode, the buttons in the MUT column act as bank mute toggles. Pages in muted banks will continue playing in sync with all active ones, but their output will not be sent out to MIDI.

This provides more immediate and intuitive handling of material in live situations.

Working with step selections

Inverse step selection editing

In PAGE mode, active step selections are edited using the EDIT encoders for the respective attribute.

Additionally, when a step selection is active, the steps that are not selected, in the tracks that contain selected steps, may be edited as well, using the MIX encoders of the respective attribute.

For example, assuming a step selection is active with steps selected in tracks 2 and 4, the EDIT encoder PIT modifies all steps in the step selection, while the MIX encoder 8 will modify the pitch of all steps that are not currently selected in the tracks 2 and 4.

Step selection stores

In PAGE mode, active step selections are stored for later recall in one of 5 stores available per page. This allows to group steps and modify them at once beyond track boundaries.

The stores 1-5 are accessible while a step selection is active via the buttons labeled 1,2,3,4,5 in the MIX TARGET row below the matrix. Just to give you an example..

To make a step selection hold the SEL button pressed and click on at least one active step (green) in the page. You should see the selected step blink green and the current selection indicated by the blinking light in the MIX TARGET row. By default it should be 1.

Now press the 2 key in the MIX TARGET area and the selection will disappear. This is because step selection 2 is empty. Let's fill it. Press and hold the SEL button and select another step or more and watch them blink.

Press the 1 in the MIX target area and you should see your previous selection blink active. You can toggle between your selections at will using the MIX TARGET buttons, and use the encoders to really bend your material.

MIDI Control Maps

As already introduced in the section on PAGE mode, you may assign MIDI Control (CC) functionality to the MIX encoders.

This is useful when you are looking to control some parameters of a more global nature, such as certain instrument volumes, or other things that are not specifically bound to a particular page.

There are 6 MIDI Control Maps. You may switch between them directly by pushing their corresponding buttons in the MIX target section of the panel.

Note that unlike in PAGE mode, when you use MIDI Control Maps in GRID mode, the modified values are not shown.

Page sets

When you have a certain number of pages in the GRID, which you are tweaking and playing in various combinations, you will eventually find combinations that you would like to recall quickly.

Concurrent page activation

Octopus can store the pointers of all active pages at a given time in what we term a Page Set. Activating or switching between Page Sets can then be done by the press of a button at playtime.

The operation is equivalent to and a shortcut to toggling a set of pages on – with all the rules that apply: only one page per bank will play, banks determine cluster behavior, page length is determined in the pages.

Working with Page Sets

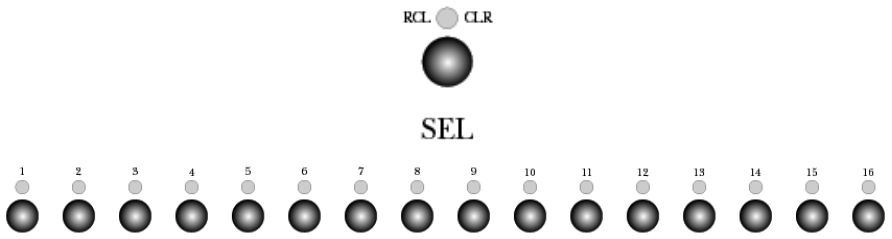
Simply activate in the matrix the set of pages that you would like to store for recall.

Once they are all playing, press and hold the green SEL button, while you press any of the 16 buttons in row 0. The buttons in row zero represent memory slots for storing your page sets.

You will notice that once you have stored a set, into a slot, its corresponding LED turns green – indicating that the set of that slot is now playing in the grid.

Now press the button of an empty slot – you will see that all pages stop playing, the slot LED lights orange (it is empty), and the previously saved slot is lit red – because it is not playing.

Pressing the red slot button will recall the page combination you had defined before for this particular slot.



Grid-Track mode

The GRID-TRACK mode may be imagined as a sub-mode of the GRID Mode. The GRID-TRACK mode provides most of the GRID functionality described above, allowing a different view on your MIDI data.

Here, matrix buttons represent tracks (as opposed to pages) and have the functionality of track selectors, as described for the PAGE Mode. We may refer to them as virtual track selectors.

Entering the Grid-Track mode

To enter the GRID-TRACK mode, enter the GRID mode first (by pressing GRID) and then press the green-lit TRACK button.

The TRACK button will blink orange, and the GRID button will stay lit in orange. This indicates that you are in the GRID-TRACK mode.

Virtual track selectors

The Matrix will slightly change its contents and some explanation is necessary to what it now conveys.

For each page playing in the GRID, you will see a lit bar of 10 LEDs, from position 4 to position 13, leaving three blank columns of buttons on each side.

Each lit button acts as virtual track selectors and the LEDs indicate the toggle state of the corresponding track.

Hands-on

As an example, let's assume there is only one page playing in the GRID in bank 1 of the grid and no tracks are muted in that page. You should see a bar of 10 green LEDs in row 1, positioned in the centre of the row (3 unlit LED's to each side of the 10-LED bar).

Working with tracks

Moving from here is easy: press and hold any of the virtual track selectors and you will see that two mutator functions become available: TGL and SOL.

Also, the EDIT block indicator blinks orange, as you may use the encoders to modify the track selected via the virtual selectors. This should come pretty naturally (or so we think).

When exactly one track is selected in GRID-TRACK mode, the pitch of that track becomes visible and editable in the inner circle, just as we have seen it in PAGE mode.

Quick track toggle

Sometimes all you want to do in GRID-TRACK mode is to toggle tracks on the fly. There is a quick way to do that by holding any button that belongs to columns 1-3 or 14-16 while pressing a virtual track selector. The virtual track selector now directly toggles the mute status of the respective track.

Zooming into tracks

You may do much lower-level editing of tracks, simply by double-clicking a virtual selector to enter TRACK mode for that track, i.e. zooming into that track. And you know your way around there already.

To return from TRACK mode to GRID-TRACK mode simply press the GRID and TRACK mode buttons at the same time – this proved to work well.

Grid-Track live mode

The GRID-TRACK live mode is much similar to the live mode in Grid mode. It is activated by pressing the EDIT button LED such that it is lit green.

When in live mode, the matrix buttons will act as toggles for the respective tracks. This provides more immediate and intuitive handling of material in live situations.

Leaving Grid-Track mode

In order to exit the GRID-TRACK mode, press either the GRID or the TRACK button. Both of them will simply take you back to GRID mode.

VIII Musical tools

The section provides descriptions for tools that are of value on the musical side of things, such as chords and scales.

Step chords

Steps may play more than one pitch at a time, effectively forming chords. Chords can be directly programmed in, or directly recorded from, a MIDI keyboard (see the section on MIDI IN Recording) into a step.

The next section will assume we are working in STEP mode. To follow along, please make sure to enter STEP mode before we move on.

To set the stage, while in STEP mode, notice the CHORD button block at the bottom right of the front panel. By default the single note chord button should be lit orange.

Chord ground rules

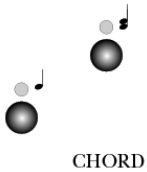
Step chords are formed of up to 7 notes which may range over up to three octaves. The chord is made up of the step pitch as the base and additional notes that are stacked "on top" and which are always higher than the base pitch. This means of course that changing the PIT offset of the step will also transpose the chord.

The chord display should be read as follows: the base pitch of the step blinks orange. Notes within one octave (12 semitones) of the base pitch light orange. Notes in the second octave up light green, and notes in the third octave up light red.

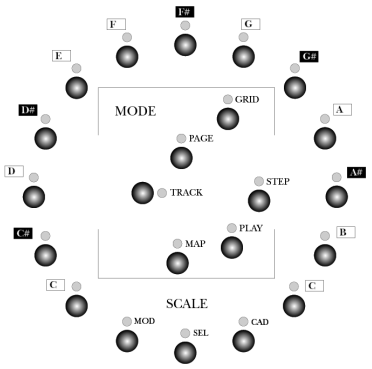
A note may not be part of the chord at the same time in several octaves. To toggle the notes manually in and out of the chord following toggle sequence applies: off > orange > green > red > off.

Playing chords

To build a chord on a step proceed as follows:



Press and hold down the CHORD button that corresponds to the size of the chord you will build. Assuming you want to build the chord C-E-G you would hold down the three-note chord button.



Next, use the octave circle to enter notes into the chord up to a cardinality of seven. Entry and display corresponds to the chord ground rules above.

When you are done entering the chord, release the chord button. You should see that the cardinality of the step chord is now indicated by the appropriate chord LED - in this case the three-note chord.

Every time the step is played, you should hear the chord that you have programmed in. To remove the chord from a step, simply remove all "extra notes" from the chord. The base pitch will not be removable.

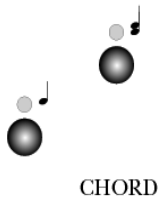
Steps that are set to play chords will be displayed by a orange dot while in PAGE mode. Steps that play only single notes are green.

Step polyphony

Step polyphony offers an exciting playground for experimentation and variation, especially with regard to dynamic pitch variation, as in random note picks from the chord pool.

Assuming you have built the C-E-G chord as described earlier, let's think about polyphony. The natural polyphony of the step is of course 3, since it is playing 3 notes at the same time.

However, polyphony may be adjusted independently of step chord contents, i.e. without changing the number of notes in the chord.



The step chord size, i.e. the number of notes in a step, is indicated by a red LED in the chord block. The step polyphony is indicated by a green LED in the chord block, When chord size and polyphony are the same you see an orange LED in the chord block at the respective position.

Random note picks from chord pool

A step whose polyphony and chord size are the same, will play a chord in the traditional sense, as you would expect it.

When step polyphony and chord size are different, the number of played chord notes is always the smaller of the two values (i.e. chord size or polyphony). Here the actual notes are chosen at random from a pool composed as follows:

- When chord size is greater than polyphony, the note pool is made up by all notes that make up the chord.

- When polyphony is greater than the chord size, the note pool is made up by the chord notes plus a number of rests ("empty" notes). The number of rests is given by the difference between the polyphony and the chord size.

Example:

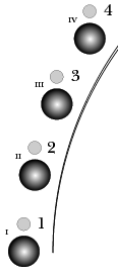
Chord is C-E-G, therefore chord size is 3:.

- A polyphony of 3 will consistently play the chord C-E-G.

- A polyphony of 2 will play two elements picked at random from the pool {C, E, G}.

- A polyphony of 5 will play 3 elements picked at random from the pool {C, E, G, rest, rest}

Strumming chords



To strum a chord, zoom into the step containing the chord, hold any of the chord buttons pressed and turn the main rotary clock-wise. You will be able to set a strum level between 0 and 9 shown as green values. This also means that the chord will be strummed up.

Turning the main rotary counter-clockwise will show the red values -9 to 0, which are indicating that you are now strumming the chord down.

Octopus comes with a preset strum configuration which affects the note start values. The strum effect increases exponentially with the strum level chosen.

Step phrases

Step phrases are a tool to quickly and greatly enrich a step. A step phrase is a group of notes that are triggered as an “avalanche” by a step, based on the pitch of that step.

Assigning a phrase to a step is very simple: from Page mode, double click the step to enter Step mode, select GRV as the attribute to edit, and dial in the phrase index using the main encoder.

You may browse through the preset phrases one by one first, before deciding what would suit your mood or material. Once you are happy with a particular phrase, you can switch view to the POS attribute, which determines the time compression factor of the step’s phrase. A low POS value means high time compression, and vice versa.

There are three banks of preset phrases available: green, red and orange banks with 16 phrases each. They are grouped as follows:

Green: note delays, simple and rhythmic ones

Red: arpeggios and intervals triggered by the note

Orange: combinations of non-deterministic values for STA, VEL, and PIT. For example, to delay a step by an undetermined number of ticks, select one of the first 4 phrases in the orange bank.

So far we have only talked about preset phrases. In case you were wondering - yes, you may edit the phrases yourself too, in any way you like. How that is done is explained in a separate section.

Having some fun with phrases..

Select a phrase for a step and its appropriate time compression (POS) value. While still in Step mode, press the Copy key to copy the step to the copy buffer. In the bottom row select another step from the track by pressing its key. If the step is empty you will see it blink red.

Now press the Paste button, and you have made a copy of the original step, including the phrase.

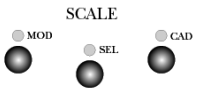
Move on and set a pitch offset for this new step (PIT encoder), and maybe even a different time compression. Repeat the procedure as you see fit.

Within a few clicks you may end up with a fairly complex structure, which you probably wouldn’t have come up with that quickly otherwise.. Enjoy!

Musical scales

Each page can be associated with a particular musical scale. Once that association is done and a scale is active, all page notes are forced to play in the chosen scale.

Force to scale



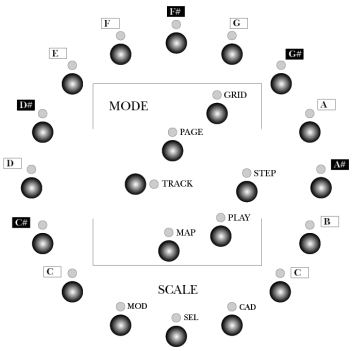
Force to scale for a page is enabled by going to PAGE mode and simply pressing the green lit SCALE SEL button. Coming from the default state, you will see its LED turn red and all scale notes light up, with the exception of upper C.

Conversely, force to scale is disabled by pressing the red SCALE SEL button, which indicates that force to scale is engaged.

So, in general, the red LED of SCALE SEL is indicating that the page pitches are forced into the scale, a green LED indicates that the page is playing the pitches as they are.

The lower C LED is also lit orange. What you see here is that all notes are selected in the scale, and that C is the base tone of this scale. Let's now modify the scale to get more interesting effects:

Composing scales



While having force to scale active as described above, press the Select button (in the outer circle, button XIV) and it should blink orange, while the Chr. scale LED is lit orange.

This picture is telling us that the chromatic C scale is currently active, but that we may select any notes in our current scale. The Select button you have just pressed is used to let you select the notes that you would like to add to your scale.

Now press any of the note keys in the scale circle to toggle the corresponding notes into and out of the scale, putting together any scale you like. Once you are done selecting the scale notes, you may press SCALE MOD again, and now you can modify (again) the base pitch of the scale you have just selected.

Another way to select a scale is to press any of the scale buttons in the outer circle, to get the scale structure associated with their label, always on the base tone indicated by the orange LED.

Changing the scale base

In order to change the base tone, press the SCALE MOD button to enter the scale modulation mode. Here you may select any of the current scales tones as the new scale base.

As you change the scale base you will see the scale signature carry over to the new base as well.

Scale cadence mode

Another way of operating the Scale data is to combine it with the CAD functionality. What this means is that any changes done to the scale will translate into immediate mappings onto the track pitches in the page at hand.

To activate the SCALE CAD, please activate force-to-scale if not already active, and then press CAD (so it blinks red indicating operation).

In order to make the effect clearly visible (on top of audible) you may also want to select the MIX mode for the track pitches (double click on the ATR key in the MIX TARGET field, then select PIT).

Now modify the scale as described and you should see the changes to the track pitches as they materialize in the matrix.

Disabling the page scale

You may want to have your page notes forced to the selected scale, but not see the details behind that and also prevent any unintended changes to the scale, essentially locking it.

In that case, while in SCALE mode, press ESC to leave the page forced to the scale, but to exit the SCALE mode. You will notice that the SCALE SEL LED will blink orange, indicating that the page is forced to scale. To go back into the scale edit mode, simply press the orange blinking SCALE SEL LED.

The grid scale

The GRID may be assigned a scale, in the same manner that a scale is assigned to a page, except the GRID scale will act globally.

To operate the GRID scale, switch first to GRID mode. Use the SCALE SEL button and proceed as already described in the section describing the PAGE Scale operation.

Exempting pages from the grid scale

Note that by definition, the GRID scale is overruled by any other scales active in particular pages.

Therefore, an easy way to exempt a page from the grid scale is to force that page to a chromatic scale. This may be particularly useful in the case of percussive material for example.

IX Advanced topics

The following describes topics and features that will put to your hands a great deal of power, leveraging some of the unique capabilities of Octopus.

Track direction editing

As we have seen in earlier sections, each Octopus track may be assigned its own running direction. This is exciting, but neither new, nor spectacular.

What may catch your attention though, is that on the Octopus you can not only specify what direction a track should play, but in most cases also edit that direction to your particular gusto.

Directions 1-5 are read-only, while directions 6-16 are user editable. Interested?

To see how all this works, let's take a quick step back and realize a couple of things. Then you will see how the pieces fall into place.

A general view on directions

To begin, have a track run at the default forward direction (Direction 1). Let it run for a few cycles in the forward direction, then stop.

Think about what you just saw: the forward direction is really "the sequence of chaser light positions in each of 16 slices of time it takes to play all steps in a track". Makes sense? Realizing this is the key to understanding how editing directions works.

Triggers and slices

Each of the 16 slices needed to play a track from end to end (no skips for now) specifies its own chaser light position trigger. For the forward direction, in slice 1 we have a trigger for chaser light position 1, in slice 2 a trigger for position 2, etc.

In simple terms, when a track is played, the chaser light will be moved according to the triggers specified by the slices that make up that particular direction. For example, the reverse direction has the trigger sequence [16, 15, 14... 1] assigned to its slices.

Full and empty slices

To take it one level further, a slice is not restricted to holding only one trigger, but may hold up to nine triggers.

These nine triggers will be played in sequence every time the respective slice is being played. This implies that a slice may take as long as nine times to play completely, because it fires up to nine triggers.

So what do we get from empty slices, i.e. where no trigger is specified? Well, every time Octopus gets an empty slice, it will pick a trigger for you at random, and play it normally.

Certainty_next

The sequence of slices is per default set to be a solid 1, 2, 3 ...16. But you can change that. Each slice has an associated „certainty_next" parameter, which is expressed as a percentage.

A setting of 100% means that the next slice will be the one following naturally (i.e. slice 3 will be followed by slice 4, etc.).

A setting of 0% will specify that the next slice will be the naturally previous one (i.e. slice 3 will be followed by slice 2).

Any value in-between will produce the obvious: for example, a setting of 50% will mean that there is a 50/50 chance by which the next or the previous slice will be called – and then its triggers played.

Note that the certainty_next parameter applies to the switch between slices, but does not apply to the trigger set and sequence inside a particular slice.

Example

For example, let's assume slice 4 has a certainty_next of 50% and a trigger set of 2, 5, and 8. Once started, the slice will first fire up its triggers (2, 5, 8) and then decide which slice to call next – slice 3 (previous one) or slice 5 (next one).

Playing direction maps

So now, how do you work with all of this? The answer is „Direction Maps". From Track Mode (of any track), select for that track the direction you would like to program.

Make sure to choose a direction between 6 and 16, since directions 1-5 are read-only and cannot be modified.

After choosing the direction, double-click on the DIR attribute button to enter the direction map. In this view, you will see in row 0 a

orange light, reminding you of the index of the position you are just about to edit.

Press some of the keys in row 0 and you will see a green blinking light following your presses – the green blinking light is showing you the index of the slice that you are just editing. When the blinking green and the orange light overlap, you will get a blinking orange light.

Editing trigger sets

The area above row 0 (i.e. rows 1-9), will show none, one, or more red lights, which specify the triggers contained in the selected slice.

You may select triggers at will by simply toggling them in the Matrix, but there can be only one per row: the trigger sequence is naturally given by the rows you select them in. Therefore, a row will only hold one trigger.

Rows holding no trigger will simply be ignored at runtime. But remember, if all rows are empty, you will get a random trigger to play in that slice before the next slice is called.

Editing Certainty_next

While editing, you may jump between trigger sets using the key of row 0 as you like. Last thing to mention is the certainty_next probability.

This is simply the number shown in the numeric field of the circle, in the top left quadrant. The number is edited as expected, using the top right rotary encoder, in addition to the buttons in the numeric quadrant.

Here, some key combinations may be of interest: double clicking 5 will produce a 50, clicking (simple) 100 will produce 100, and double clicking 100 will produce a 0.

For the rest, it is left as an exercise to the reader to look at how the five default directions are programmed, in order to get the final clarification or confirmation on having understood how the Octopus direction model works.

Please also refer to the dedicated tutorial in the back section of this manual or available as a separate document on our web site.

Remarks

The direction map is no different to the other maps we have seen so far: press ESC at any time to return to the page mode, but be aware that any change you make to the direction will be permanent, like any

other change on the Octopus. However, unlike with regular MIDI data, there is no „PLAY“ capability for the directions.

You may however use CLR to restore the default directions in the slots 1-5 and the forward direction in the other slots. In fact, remember that directions 1-5 are read-only and not editable.

Finally, when you need an inspiration boost, go into a direction map and start using RND. That one may get you going.

Track attribute maps

Now that we have looked in some detail at the mutators while in TRACK mode, you may wonder what is going on to the left of the matrix – in the selector column.

The selector column

You see that some of the LEDs are lit up, and some aren't. Each lit button represents something we call an attribute map for the track. There are attribute maps for the following attributes: VEL, PIT, LEN, STA, AMT, GRV, and MCC.

What is an attribute map?

Glad you asked. Simply put, an attribute map is a view of a particular step attribute for the entire track.

Confusing? Let's look at an example: the VEL map would be the view that shows you the velocity offset of all steps of a track at once.

This is true with one exception – that is the DIR line. In the case of DIR we do not have a map per se, but rather the capability to edit the direction configuration for the sequencer. The details are explained in the chapter dealing with directions and we will disregard it in this section.

Example

Press VEL and you will notice that keeping it pressed will make it blink orange and the mutator column will make CLR, RND and ZOM available. Briefly – CLR and RND will affect the track VEL map and either clear it to default value or pick a random value. Now the interesting one:

Showing attribute maps

With the VEL selector still pressed, press the ZOM mutator to get to the MAP mode. What you now see is the VEL map of the track you are working on.

You can also enter MAP mode by double-clicking the attribute button (VEL in this example).

Working with attribute maps

The matrix display is built up starting at row 0 with the pattern of the track under consideration.

Here you may toggle, select and skip steps as you would in PAGE mode, as already described in the introductory section – also holding them and tweaking their parameters will work – but leave that for a moment to avoid confusion.

If the sequencer is playing, you also see a red chase-light in the row of the track currently being worked on.

Reading attribute maps

You may think of the area made up by rows 1-9 as divided into 16 columns, one for each step represented in row 0.

For each step, the column will display a bar corresponding to the value of the attribute whose map we are seeing. Remember that this is the attribute value of the steps, before the steps are affected by any sort of track offset.

Representation

For values that can be negative or positive (VEL, PIT, STA), a zero value is represented by a line of LEDs on row 5. Positive values are above the line and negative values are below.

Now press any button in row 6 – as an example. You will see that the bar for the step in the column of your press will jump to the position of the button you have pressed.

Reading the real values

The real value of the step attribute offsets can be read out easily by holding the respective step pressed in row 0.

For this purpose, you may also want to (temporarily?) use the preview mode (toggle the EDIT LED to red), such as to not affect the toggle state of the steps you are viewing.

The value is displayed in the numeric quadrant of the circle, and is always shown as a sum of the track and step value for that particular attribute.

Also note that while the meaning of the large circle value is changing, the pitch circle is always dedicated to showing the pitch.

This is just a quick but very powerful way of entering data for the steps of a particular track.

Values may also be entered using the keys of the circle fields. I.e. entering a velocity value for a step is similar to entering a tempo value. You will see the new value reflected in the matrix display.

Reading the pitch display

The way to read the display is the following: the red dots will indicate the octave and the green dot will indicate the note in that octave.

For example three red dots starting at C and a green dot at G mean the pitch is G in octave 3. Exception: two red dots starting at C and a orange dot at D mean that the pitch is D in octave 3.

Entering pitches

Entering pitches is done by pressing the appropriate note. In order to transpose octaves use the left and right keys labeled “C”.

Finding your way around the maps

The selector column allows you to jump directly between the available track maps. The mutator column allows you to use some functions on the map.

CLR will restore default values, RND will choose random values for each column, and RMX allows you to call and actually observe what the RMX operation is doing to your track parameters.

ZOM, which is now lit red, will take you back to the track mode without un-selecting VEL, and pressing ZOM again from there will bring you again into the map mode.

Shifting maps

The POS knob in the Editor block is also assigned a function – turn it and you will see your attribute map just shift around the track, without affecting the step toggle states or the other attribute maps, but having certainly surprising effects on your sequence.

Switching tracks

You may fetch any track into the map view by simply ticking (to the left or right – it doesn’t matter) the mix encoder corresponding to the map you want to fetch into the display.

Track CC map resolution

Track CC maps have a specific property associated with them, and that is resolution.

Per default, Track CC messages are sent on each step, according to the respective track and step MCC values. In addition, intermediate CC messages may be sent between CC steps. This effectively increases resolution of the CC stream, resulting in smoother controller flows.

In MAP mode, with MCC as the selected attribute, the resolution for the current track may be selected by using the chord button block. The minimum (and default) value is 1, meaning that one Track CC message is sent per step.

A value of 5 for example, denotes that 5 messages will be sent for this step. The first one right on the step, the other 4 distributed evenly across the interval of time until the next step is triggered. The intermediate values automatically create a linear slope to the next value.

Map factors

Maps are useful in the sense that we can see and edit a particular step attribute for all steps at once.

Step attribute scaling

There is another advantage we get from maps – and that is the easy factoring or scaling of step attribute effect on the play result.

Using a scaling factor for each map of a track, we can now determine to what degree a map is applied to the play data.

In fact, the track attributes LEN and STA themselves are really scaling factors for the corresponding attribute maps.

Map factor setting

In all cases, the middle setting of the scaling factor will play the steps unaffected, while tighter settings (lower values) will reduce the effect of the played map values. Looser settings will amplify the effect of a map on the played result.

The value range for the map factors is numerically between 1...17, with 9 being the neutral setting. Note that due to the way the display is set up, the values for LEN and STA shown in the TRACK mode are depicted as 0...16, with 8 being the neutral value.

Lower than neutral values have a reducing effect, higher than neutral values have an amplifying effect.

The neutral value is displayed as a orange 1, reducing values shown using a green bar, and amplifying values shown using a red bar.

Working with map factors

In order to view the scaling factor of a particular map, go to track mode, and press and hold the corresponding attribute selector. The numeric quadrant in the outer circle will display the scaling factor.

An orange dot at the 1 position indicates the middle setting. Turning the main rotary will either render a red bar up, or a green bar down, depending on the turn direction.

Note that the map factors may also be accessed directly from the MAP mode. Use the main rotary encoder to modify the respective value.

Step events

Steps may be used to generate so called events. Events are simply automated changes that happen at runtime. In general terms, an event is a programmed change of the attributes of a track and is attached to a step. All track attributes may be modulated by events.

The finer definition is however, that for the DIR, POS, and MCH events the track attribute value changes, while in the case of the other attributes, (VEL, PIT, LEN, STA, AMT, GRV, and MCC) what changes is really the attribute map factor.

Please refer to the section on attribute maps for details.

Creating events

To create an event, double click on a step to zoom into it, and select one of the attributes in the SEL column. As discussed earlier, initially these are all lit, waiting to be selected. Once selected as an event, they will blink.

You will notice that some are colored orange, some green. The orange attributes indicate that their events will influence the attribute map factor, while the events for the green ones will change the attribute value directly.

Set event values

The amount (AMT) value of the step determines the change in the track attribute every time the step is played.

In the case where the set amount is larger than the possible value range of the target, a modulo operation will be carried out to bring it into the range. Note that the changes can be positive or negative, according to the amount value.

Random event values

A non-zero value of the GRV attribute for the step generating an event will result in a random value between 0 and the value set in the amount (AMT) attribute.

Event range settings

Sometimes it makes sense to limit the range in which the event change occurs to a value below the size of its natural range. Those

values are 17 for each of the attribute map factors, 16 for DIR and POS, and 32 for MCH.

To change the size of the interval used by events, proceed as follows: go into STEP mode, i.e. zoom into your respective step. Activate an event and you should see the current size of the event interval for the selected attribute displayed numerically in the numeric field of the outer circle. Use the main rotary to adjust it to your desire.

What you should notice is that the changes produced by the events will be bound between the base value of the track for that attribute and the sum of the base and the interval size.

Event execution

Another detail that may be of interest is that events will always execute exactly on the beat and not be influenced by the step's STA value to be pulled or pushed against the time line.

Clearing events

Events may be cleared from a track by zooming into the step and pressing the flashing SEL attribute button so it is solid orange or green again.

AMT events

You may have noticed that while the AMT value of a step determines the effect an event has on its respective attribute, the AMT map factor may be modified by events as well.

By creating AMT events, you are effectively able to have dynamic changes in the actual amount of change that is being applied to an attribute map factor, so we will be seeing changes to the change rate! This is a powerful instrument to create evolving and to a large degree unpredictable sequences.

Step event offset reset

Finally, a step AMT of 0 (zero) will discard the offset that was produced by a step event.

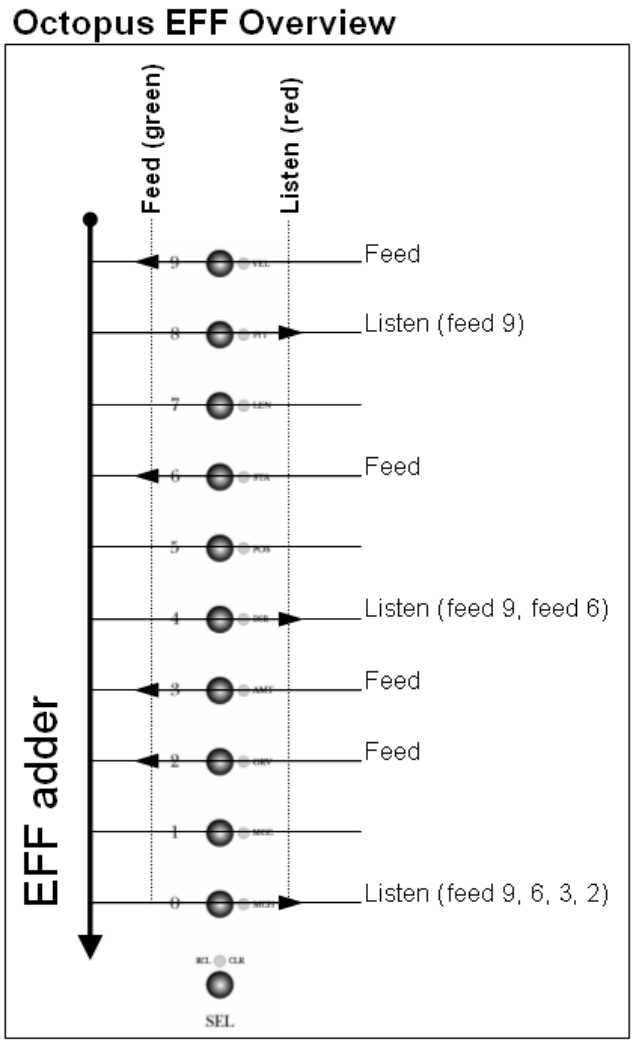
The Effector

One mutator button was not mentioned yet, and that is the EFF mutator. What is EFF?

To be precise, EFF is not as much a function as it is a state switch, enabling the track to participate in cross modulation across the PAGE. Some additional explanation is needed here, so let's start with the theory.

In each Octopus page there is the notion of an Effector. In simple terms, the effector is a mechanism allowing tracks inside a page to modulate other tracks inside the same page.

Modulation here refers to projecting Step attribute offsets from one track to another at a time at which the modulator track is being played. The affected Step attributes are Step VEL, PIT, LEN and MCC.



The EFF mechanism

The modulation is always happening "top-down", i.e. upper tracks may modulate lower tracks, but not vice-versa.

Here "upper" and "lower" refers to the respective track index. For example, track 9 may modulate all other tracks but track 0 cannot modulate any other track.

Feeders, Listeners and Listening Feeders

Modulator tracks are called "feeders" and modulated tracks "listeners", for a better distinction of terms.

Because the effect of the feeder tracks is additive down the track indexes, you may picture the feeder tracks as feeding the effector and listener tracks listening to whatever is in the effector at their particular index slot.

A track may also be both a listeners and a feeder, which we call a listening feeder. This means that if that track itself is playing notes, then the attributes of those notes are modulated, while the resulting values will modulate the corresponding listeners below it.

Effector dry-run

In the example below, Track 9 is feeding its Step offsets for VEL, PIT and LEN into the effector.

This means that all listeners in the page may be modulated by those offsets. In this example we have set tracks 8, 4 and 0 as listeners, and therefore to be modulated by track 9's offsets.

Assuming that Track 9 is currently at a Step whose PIT offset is +3, and assuming no other feeders exist, the notes played in the tracks 8, 4, and 0 will be played 3 semitones higher than defined in those tracks for the current position.

But: track 6 is also a feeder, and modulates all listeners below it, i.e. Tracks 4 and 0. Assuming that the current Step in track 6 has a PIT offset of -1, listener tracks below will see a total PIT modulation effect of +3 -1 = +2.

Similarly, Tracks 3 and 2 are set as further feeders, which means that the last listener, Track 0, is being modulated by four feeders: Tracks 9, 6, 3, and 2.

Assuming Tracks 3 and 2 each have a Step PIT offset of -2, this means that the net PIT offset for row 0 is: +3 -1 -2 -2 = -2.

Remarks

The values fed into the effector are really the deltas between the actual step offset for a given attribute and the default value of that attribute. In the above example the default step offset was always 0.

The first remark here is that the offsets fed into the effector may obviously be both positive and negative.

The second remark to make is that the attribute values fed into the effector by both feeders and listening feeders will be influenced by the factor set for that particular track.

Using EFF with events

The effector may be used in conjunction with using events to modulate the track attribute map factors.

We will not elaborate further on the possible results, and leave it as an exercise to the reader, but this does open quite new ways of cross modulation among the page tracks.

Playing the Effector

Feeders

On to the operation of the Effector. Just as a reminder, the Effector is a track specific attribute and as such it must be toggled either in TRACK mode, or from PAGE mode by grabbing the track and pressing the TGL button in the MUT column.

Setting a track to be a feeder is done by pressing its EFF mutator and toggling its EFF state to green.

It is important to note that a Feeder track need not contain any active Steps, i.e. need not play any notes in order to act as a modulator for other tracks.

Listeners

In order to set a track to be a listener, click its EFF mutator to toggle it red. Pressing a red EFF button will toggle it orange, making the track a listening feeder.

Listening feeders

A listening feeder gets modulated first and then amplifies the incoming modulation with its own effector feed.

Pressing the EFF button will toggle it off, with the track not participating in Effector modulation.

Playing

For the Effector to work, it is merely the offsets of its Steps that count, and it is completely irrelevant whether those steps are generating MIDI notes or not.

However, if an effector feeder does contain active steps, these will be played regularly, as they would independent of the effector.

Muting

If a feeder track is muted, it will not have any effect on listener tracks. Toggling feeder tracks is a quick way to introduce changes to a track and then to go back to the original sound.

The Effector at work

Designate a feeder track. Set step 1 in the feeder track and pitch it up or down.

Now select a track with an index smaller than the effector feeder (this is essential) and build a pattern into it involving lots (if not all) steps. Make sure that step 1 is set as part of the pattern and play the pattern.

Now make this track listen to the effector by toggling its EFF mutator to red by double clicking on the EFF button.

You should now hear that the step in column 1 of the listening track is now played differently, with the PIT offset from the Feeder track applied to it.

The popular thing to do now is to start changing the track lengths for feeder and listener to get long-running modulation results.

Editing step phrases

Enter The Phrase Editor

To enter the phrase editor, double click a step, and then double click the GRV button in the SEL column. The phrase editor mode is easily recognized, since all of the 7 chord note LEDs on the right are lit.

Equally, you may access the phrase editor by entering track mode (double click one of the track selectors), and then double click the GRV button on the SEL column.

The bottom row (Row 0)

The bottom row of the matrix (row 0) shows the index number of the phrase currently being edited, by a blinking LED of the corresponding color. If you see nothing shown there, you're looking at phrase #0, the default setting for a step, and which has no effect, i.e. plays the step as is. Turn the main- or GRV rotary to change phrases and switch the view accordingly.

The 7 green note LEDs are mostly there to tell you that they may be pressed: to set the optional phrase polyphony, press one of the note buttons to make it blink orange. To restore the phrase to normal, full polyphony, press the blinking note button again, and the blink will disappear.

The Matrix

The matrix shows one of the four main attributes (VEL, PIT, LEN, STA) of all 8 phrase notes together, one note per row. Row #1 shows the data for phrase note #1, row #2 shows note #2, etc.

A green LED lit at the end of the row means that the phrase has a note defined for that line. If you don't see any green LEDs lit on those lines, you know the phrase has a zero note count. A red LED is shown there only for phrase #0, which is read-only.

Top row always shows the phrase type coded as a number of orange LEDs. The available phrase types are as follows:

Type 1: Forward: notes are played in the order 1,2,3..

Type 2: Reverse: notes are played in the order 8,7,6..

Type 3: Random pitch: programmed notes pitches are played in random order, determined at playtime.

Type 4: Random all: programmed note attributes played in random combinations, determined at playtime.

For example, 4 orange LEDs means the phrase has type Random all, as described above.

MIXER Block

The top four orange LEDs in the MIXER block indicate the attributes available for editing, which are VEL, PIT, LEN and STA in top-down order. The currently active attribute is blinking orange. To select another attribute, simply press the associated button. This will change the content shown in the matrix.

The rotaries in the MIXER block are used to change the currently selected attribute for the note on the matching row. The rotary of row #9 at the top is used to change the phrase type.

Mutator block

The following buttons in the MUTATOR block are supported:

- CLR

The CLR button will clear the whole phrase to empty, if the phrase was non empty. When pressed again (in an empty phrase), it will restore to the factory preset phrase.

When pressed while grabbing one of the four orange attribute buttons in the MIXER block, CLR will only clear the data of the selected attribute.

- RND

The RND button will randomize the whole phrase. When pressed while grabbing one of the four orange attribute buttons in the MIX block, RND will randomize the data of the selected attribute.

- CPY and PST

The CPY and PST buttons will allow phrases to be copied and pasted between slots in the phrase bool. Note that phrase #0 can only be copied from.

EDIT Block

Some of the rotaries in the EDIT block are supported:

- POS

The POS knob changes the groove of the current phrase in a very nice way. When turning to the right, it stretches the timing to the next available straight-, triad- or dotted version of the original, and when turned to the left it does a similar thing by compressing the

phrase tempo. This allows one to try a triad or dotted version of the phrase just by experimenting with the GRV knob.

Note that if POS doesn't understand the timing of the current phrase, it uses a simple factor two multiply or division for the new groove. POS uses the STA offset of the first non-zero phrase note to analyze the timing.

▪ GRV
The GRV knob (like the main knob) selects another phrase from the pool for editing.

Save Your Work

The phrase pool is saved as part of the global Grid object, along with other global data. The grid object is saved when the full machine state is saved. To save the full machine state do this:

1. Go to GRID mode.
2. Stop the machine.
3. Press GRID + Program.
4. Wait for the progress lights to complete the circle.

Note that the saved Grid data will survive OS updates from OS version v1.6x and newer.

Hypersteps

Let's start with a short background, to help explain the idea of hypersteps. Normally steps trigger notes in the following sense: they provide the start, the velocity, and the length (playtime) of the played note.

Now imagine that the played note is not "only" a note but rather a note sequence. And imagine the step is now providing the start, velocity and playtime of the note sequence, such that the note sequence always plays to its end, always time-adjusted to the given playtime.

The final bit of the picture here is that our presumed note sequence may be a track which is controlled by a step in the manner described.

We call such a step a hyper step. In short, hypersteps are steps that do not trigger notes, but trigger tracks in their respective page. Therefore, if a track is linked to a hyperstep, once the hyperstep is played, the track is being triggered to play at a speed corresponding to the step absolute length (in 1/192), and taking over the hyperstep's velocity and pitch offset.

Engaging hypersteps

To use hypersteps, go to PAGE mode, hold a track selector down, and at the same time designate the hyperstep in the matrix, in a row other than the track's (by pressing it down as well). You will see that both the track selector and the hyperstep start "shining" green.

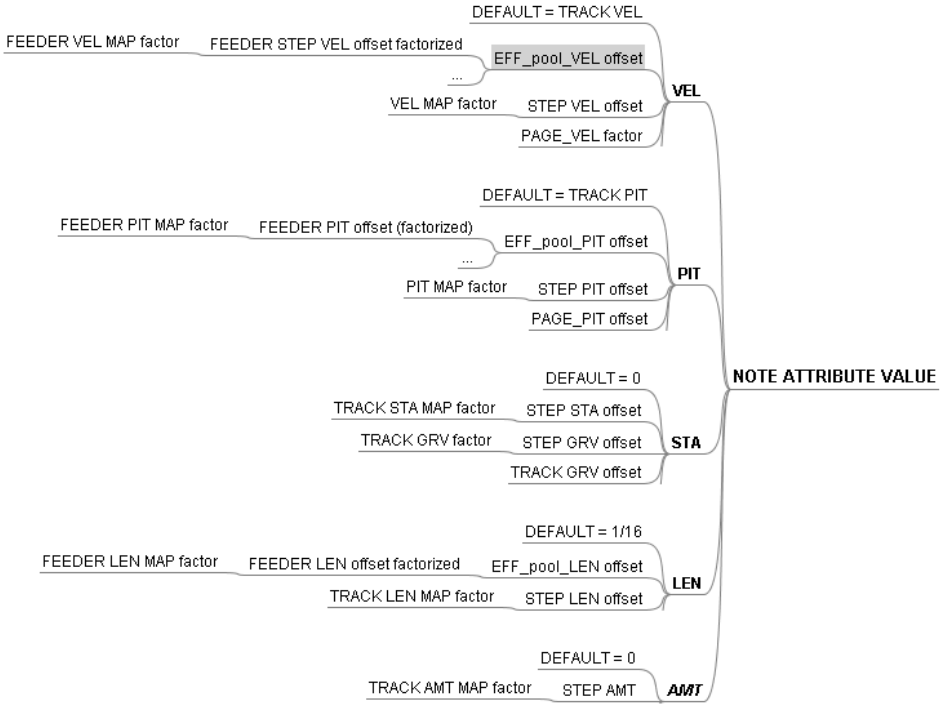
A track can only have one associated hyperstep.

Destroying hypersteps

To disengage or destroy the hyperstep of a hyped track, hold the respective track selector pressed and then press a step button in the matrix row of the track. The association between the step and the track will be removed.

Note attribute computation

In the following we would like to summarize the mechanism of note attribute computation. The model is depicted by the diagram below. Some explanation is necessary here on how to read the picture.



Velocity

Let's use the VEL attribute first as an example. The default note VEL value is the Track velocity. Per default this is 64.

Then, the track velocity is offset by the value generated by the effector. The effector offset in turn is generated by a step offset in the feeder track, factorized by its local VEL map factor. In the default case, where the effector does not apply, this offset is 0.

Next comes the offset generated by steps on our track. Their offsets may be anywhere between -127 and +127 but can be modified in turn by the VEL map factor of our current track.

Finally, the page VEL factor is applied to the value computed so far, generating the final velocity value that is output via MIDI. Note that this value is bound within the interval 0...127.

Pitch

The pitch value is computed in a very similar fashion to the computation of the velocity value.

The only difference is in the application of the page PIT offset, which is an actual numeric offset, as opposed to a factor in the case of velocity. The pitch value is also bound within the 0...127 interval.

Start

The note start value represents the trigger position of the note with respect to the “beat bar”, which would be a “0”.

The step start offset is first applied, and it is influenced in turn by the STA map factor in the respective track.

Further, the step GRV offset is applied, and this one is also influenced by the GRV map factor of the track.

Finally, the track GRV offset is applied to get the final start value of the note.

Length

The default length of a played note is 1/16th.

The length is influenced by the effector in ways similar to velocity and pitch: the effector contributes a length offset to the default, before the local step length offset is applied.

The local step length offset is in turn influenced by the track’s LEN map factor, which is the same and the track's LEN attribute.

With the length value computed, we now have all the information needed to play a note on a sound generator.

Amount

While AMT is not needed to play a note, it is mentioned here, since it is a key influencer, and may be influenced itself by its track AMT map factor.

X MIDI IN

Octopus is capable of both recording and reacting to MIDI IN data in a multitude of ways. This is yet another power tool in your hands. The following section digs into the details.

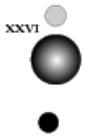
Note stream recording

Octopus is capable of recording incoming MIDI note, MIDI controller, pitch bend and channel pressure data onto its tracks, at (sequencer) runtime.

Note recording is polyphonic, meaning that chords may be recorded in from an external keyboard onto a track. Not only that, but you may also record on more than one track at a time.

Moreover, Octopus is capable of forcing MIDI input into its scale without actually recording the output, and a few tricks more.

Arm recording



To record a track, got to PAGE mode, press the REC key to activate the Recording mode, and then simply hold a Track SEL button while pressing the REC key again, to arm that track for recording.

Press Play to start the sequencer if it was not playing, and you are ready to start MIDI recording.

Use any external MIDI controller to record MIDI data on the selected track. Note that with one track armed for recording the MIDI input is automatically re-channeled to the channel of the armed track.

While in stop mode this provides for a comfortable way to pre-listen to what the tracks will output, or to trigger their connected MIDI destination. This is especially convenient as all data, including notes, pressure, pitch bend and CCs are being routed through.

You can browse through the tracks in a page by selecting them one by one and have the record selection state move along. Together with the noted re-channeling behavior you can use a single MIDI keyboard to play and hear all tracks, in both Stop and Record mode.

Record rehearsing

Sometimes you may just want the re-channel capability described above but without the actual recording being done. This is useful

when you want to play along an instrument of a given track but do not want to record straight away.

To enter record rehearsing, make sure all record activity is off (no track SEL blinking red, the REC key is not blinking red). Now hold a track SEL button pressed and click on the REC button.

The Track SEL LED will blink red, indicating rehearse mode. Pressing the REC key again will finally enable recording for the armed track.

Multitrack recording

In order to record on more than one channel at a time, you may make a multi-track selection and press the REC, just as above.

However, note that in multitrack recording the MIDI source to be recorded needs to send on the same MIDI channel as that of the destination tracks – i.e. the one you have just armed for recording. Also, make sure to send the MIDI data into the correct MIDI IN port on the Octopus, i.e. the one that the track is set to send on (IN 1 or 2).

To cancel multitrack recording press a track selector in combination with the Stop key to disable track record selection for all tracks in all pages. This basically allows for record re-channelling the next time a track is armed for recording.

Recording chords

A track will stack the note data input such that you can make up chords by simply playing one note on top of another. Of course, you will need to be good on timing with this one. Playing chords directly on your keyboard will also generate a chord on the Octopus step under the chase-light, making it very easy.

When stacking notes up to make up a chord, you will notice that the length, velocity and start value of the step will use the values of the last played note for all notes in the chord.

Note that chord recording is subject to the same restrictions that apply to building chords into steps – a chord cannot span more than three octaves.

Disable recording

To disable recording for the track in question, simply press the blinking REC button, to return to rehearse mode. From there press REC again to return to normal operation.

Reflections on MIDI recording

While MIDI recording is one of the most exciting and useful features in Nemo, some restrictions do apply, as we have seen already.

The MIDI recording capability of Nemo and Octopus, while extensive and clearly unmatched in hardware step sequencers, should not be viewed as "what goes in, necessarily will come out" functionality, which you may experience on software packages for example.

The reason for this is quite simple: step sequencers underly a certain granularity constraint that is given by the interface, such as the number of steps in a track, which again give you advantages which other sequencer paradigms do not. Therefore, on Nemo, steps, while polyphonic, will force certain input into certain start positions which may sound different to your ears than what you have played in.

In other words, if you are looking to input material naturally, which you then work and interact with further inside the sequencer, you are spot on. If you are about to record your piano sonata as a MIDI stream for later identical replay, you may not be using the right tool. One of the many simple and possibly free software package for MIDI recording may be a better choice than a highly sophisticated hardware tool.

MIDI Controller stream recording

Generally, MIDI controller data is recorded as it is coming in, similar to a note stream. Arming and disabling tracks for recording works in exactly the same way.

Once you have set a track for recording, your controller movements will be recorded onto the recording track. Also, the description below applies equally to recording pitch bend and channel pressure data.

Auto-sensing

The track's MIDI CC parameters are auto-sensing the controller and the associated data and will perform the recording of the controller accordingly.

A fun exercise may be to enter MAP mode and observe the MCC values while turning a knob on your controller and watch the MIDI CC input being recorded as it comes in.

Please note that tracks whose MCC value is other than "none" (i.e. 4 green LEDs in the positions 13-16) will have an orange chase light in PAGE mode.

Considerations

Remember that a track may only play one controller at once.

Therefore, if you have created a controller map for some controller and then operate some other controller, the map will play the controller data for the last auto-sensed controller.

This includes pitch bend and channel pressure, which are handled by Octopus in a similar fashion to a controller.

Note that pitch bend data is recorded using two value bytes (as specified in the MIDI protocol), essentially with an available resolution of 14 bits.

However, when editing the MCC data you will currently only operate on the most significant 7 bits of the value. This allows working with bender data to fit the model of working with MIDI CC data.

When clearing the Track CC map (CLR) note that also the least significant 7 bits will be cleared.

Step note recording

Octopus offers an alternative to note stream recording, and that what we term step-note recording. Note that this is not the same as step recording in other sequencers, therefore the slightly different name.

The idea is simple. Once a page is armed for recording, you hold down a step button, play a note on your keyboard (or whatever MIDI controller you're using), and voila! The step is entered. This only requires the page to be armed for recording. Simple!

Arming a page for recording

With no track selected, hold down the PAGE button and then press the REC key, and you should see the REC LED blink orange. You have now armed the page for recording, allowing you to perform step-note recording and more.

Step-note recording

Holding a step on the matrix, and playing a key on your keyboard will assign the note data (including velocity) to the selected step.

To record more than just one step in a take, simply keep playing on your keyboard and you should see the played notes fill in one after another. They will default to length 1/16 and will simply follow the flow of the respective track.

Also note that the recording of MIDI data will follow the pattern described in the following.

Fresh recording

If you step-note record on a step that is turned off (i.e. you pressed it once on, then off again and did not release the button yet), the step will be freshly assigned the value of the incoming note.

Stacked recording

Step-note recording on a step that is turned on will stack the incoming pitch on top of the already existing data, letting you effectively create chords.

Chord recording

You may record chords directly, in the same manner as simple notes. You can record chords stacking on top of what's there already, or starting from scratch.

Track live transposition

Finally, if a track is selected while a page is armed for recording (a track selection may also be locked in using the SEL button), you will dynamically and directly change the pitch assignment for that particular track effectively transposing it a playtime.

With only one track selected, and holding the track selector pressed, you may observe the change in pitch assignment directly in the pitch circle.

Advanced recording

There are some more details to recording that need special consideration. Some of them may have already come natural to you, so you may find them again documented below.

Chained track recording

At any time, only one track will be recorded into, and that will be the recording armed track of the current page.

In order to record takes that are longer than 16 steps, simply build a track chain and enable one of the chain tracks for recording.

Chained page recording

In complement to the above, you may record takes longer than 160 steps too, by using the page clustering function.

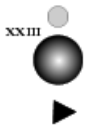
Simply cluster the necessary number of pages, set their track chain configurations, and enable in each of the pages the recording tracks.

Generally, when a recording track is part of a chain, the recording „lock“ (blinking red selector LED) will carry along with the chaselight in that track and move from one track of the chain to the next.

Note that the Track DIR setting will be followed even during MIDI recording.

Try taking the output of another sequencer and recording it, while the Random or Brownian DIR is set. Interesting things may happen.

Recording re-take



If you absolutely do not like what you have recorded you can always use the CLR functionality, as we have seen it before.

Alternatively, while in PAGE mode, you may press the PLAY key to clear the track that is currently armed for recording.

Note that if the recording track is part of a chain, the content of all tracks in that chain will be cleared.

Data intervals

There is a limitation on the range of data that may be recorded.

While the MIDI protocol allows for pitch and velocity values to be in the range 0...127, this range is constrained by the internal architecture of Octopus.

We will explain what this means using the example of PIT – the one you are most likely to first encounter in practice.

As you have seen in previous chapters, the pitch of a note played by Octopus is computed as the sum of the track base pitch and the PIT offset of the particular step.

The track PIT value can be anywhere between 0 and 127, however the step PIT offset may be anywhere between -127 and +127, always taking the track PIT value as the reference point.

Quantized recording

In the section on attribute map factors, we have described the workings of the factoring mechanism. One application is non-destructive quantization of track content, including recorded material as you record it during a live session.

In order to get quantized output, you may want to set the STA factor for the track to the lowest possible value, case in which the map is not in effect.

Note that you may always increase the factor for the STA map in order to gradually increase the amount by which steps are pulled or delayed during play.

MIDI Control Map learning

While somewhat unrelated to what we have discussed so far, another aspect of MIDI recording is the ability to have a MIDI Control Map learn from the MIDI input.

Entering MIDI Control Map mode

Enter the MIDI Control Map mode by first disabling any recording mode (if necessary), and double clicking on one of the MIDI Control Map selectors (0-5) at the bottom of the matrix field.

Arm MIDI Control Map learning

While in MIDI Control Map edit mode, press the REC key to arm the learn mode. As soon as you press the REC key you will see that a red blinking light will appear in the selector column of the page.

Select target

Pressing across the selector buttons will move the position of the red light, and effectively select the encoder for which we want to make the assignment.

Per default you will see the amounts of the map displayed, and this is the most spectacular place to be: if you are turning knobs on an external controller you will see the amounts of the learning encoder go up and down immediately.

However, note that the MIDI channel and the controller number are recorded as well.

Disable MIDI Control Map learning

Simply press the REC key again to exit MIDI Control Map learning mode, and you may switch the view of the MIDI Control Map accordingly, to verify your results.

External force-to-scale

Forcing MIDI notes to an Octopus scale

While in page mode, with the page armed for recording (press and hold PAGE while clicking REC), your external MIDI input will be forced to the scale of the current page. Of course, this is assuming you have a scale enabled for the respective page.

This is especially interesting in performance situations, obviously.

MIDI merge

By selecting a chromatic scale for your page you can effectively implement a MIDI merger functionality of the data your Octopus is producing and the data that you provide on the MIDI in port.

Note that this is only applying to note data, and not to other MIDI data, such as controllers.

External scale editing

In the chapter on scales we have explained how to build and modify a scale. We have used the Octopus pitch circle to select the notes of the scale, or the base bitch of the scale accordingly.

However, you may do the same changes using MIDI notes on the Octopus MIDI in port. These could be generated by a MIDI keyboard for example,or even another sequencer - or the other Octopus MIDI port!

Arming external scale edit

To do that, arm the page for recording (hold PAGE and press REC), then simply enter scale mode by pressing SCALE SEL.

All notes received on the MIDI IN will be interpreted in the same way that key presses in the pitch circle will be interpreted.

Disabling external scale edit

Press the REC button again to disable this mode. Or simply disable the scale by pressing SCALE SEL again.

External program change

Octopus allows external control of page toggle states via program change messages. The program change messages received will be interpreted according to the channel they arrive on. The MIDI port however does not matter.

Arming program change listening

To activate program change listening, you need to go to grid mode, hold the GRID key pressed and then click the REC key. You will see the REC LED blink orange. Pressing REC once again will switch the listening off again.

Grid set selection

Program change messages received on channel 10 will trigger grid set selections in the GRID. It is equivalent to pressing a grid set selection key in the matrix.

The grid set index will be computed as a modulo function of the incoming program change message.

For example, MIDI program changes 0-15 will select grid sets 1-16 respectively. A MIDI program change message of 33 will select grid set 2, which is computed as follows:

(33 % 16) + 1 = 1 + 1 = 2.

Page toggles

Program change messages received on MIDI channels 1-9 will act as toggle signals for pages in the respective banks.

Let's take an example: a program change of 33 on MIDI channel 7 will toggle page 2 of bank 7.

If some page other than page 2 was playing in bank 7, page 2 will be activated for play and the previously playing page will be muted.

Similarly, if page 2 was indeed playing, it will get turned off and no other page in bank 7 will be playing.

XI General tools

The following section presents the more infrastructure oriented features and functions.

Utility functions

Chase-light align

There are many reasons why your chase-light in a page may become misaligned in a visual sense. Sometimes that's what you want, but sometimes not.

In order to line up all tracks in a page, simply press the ALN button.

This will re-synchronize all tracks to the Octopus global master-clock, as explained in the section on the GRID mode.

As a side comment, the chase-light will also be realigned whenever you Stop and then play a sequence. Pause and Resume (pressing pause again) will not realign the chase-light

Interface locking

Sometimes you may want to hide the Octopus from preying eyes or even unauthorized button pressers.

At any time, regardless of the playing status of the machine, you can engage the interface lock by holding GRID and pressing ESC at the same time.

The result will be that only the tempo LED will remain lit and blink at the rate of the internal clock. All other LEDs will be turned off, and seemingly all keys will be disabled. The only operating knob will be the tempo knob.

In order to unlock the machine you may double click on the GRID mode button to return to normal operation in GRID mode.

MIDI clock synchronization

MIDI clock selection

Per default, Octopus does not send or react to MIDI Clock information. However, Octopus may act as a MIDI clock source in your setup, or will synchronize to some other source.

The MIDI clock state is selected and indicated by the button / LED numbered "200" in the top part of the outer circle.

When Octopus is MIDI clock master, MIDI Clock signal will be sent out of both MIDI ports.

When Octopus acts as MIDI clock slave, MIDI clock will be received on a single port. The MIDI port that receives MIDI Clock will be automatically detected and requires no explicit selection by the user.

The MIDI Clock state is remembered as part of the machine state, when the machine state is saved. See the "Instrument State Save" section on saving the Octopus state.

Master

An unlit clock indicator LED means that Octopus is not sending and not receiving MIDI clock information.

Pressing the clock selector turns it orange – indicating that Octopus is sending MIDI Clock as well as associated transport commands out both MIDI ports. Another press toggles it back to off (default mode).

Slave

A double click turns it green or red (more on that below), meaning that Octopus is now listening to the MIDI clock and that is is acting as a MIDI slave.

Change of clock selection (switching between master and slave mode) is possible only in GRID and PAGE mode.

MIDI Clock echo (in slave mode)

MIDI clock that is received while the machine is in MIDI slave mode can be sent out to the MIDI out, so other devices can be slaved along the same chain.

When switching to slave mode using the 200 key, the default color of the 200LED is green. Pressing it once toggles it to red, with a red setting meaning that the clock information is passed through.

ALL NOTES OFF message

When the sequencer is not running but is defined as MIDI master or slave (the 200 LED is lit either orange or green), pressing the Stop button will send out an ALL NOTES OFF message (controller 123) on each of the 32 MIDI channels.

System load handling

Natural bottlenecks

The flexibility for composition offered by Octopus translates into possibly huge amounts of data being generated at a given time.

This makes two natural bottlenecks visible: the bandwidth of the MIDI pipe and the capacity of the Octopus central processing unit (CPU).

Load monitoring and dropping

Octopus is built with timing stability in mind. However, too high loads of data would result in potentially massive glitches. To prevent that Octopus constantly monitors its load.

Should any of the two bottlenecks be full, load will start to get ignored. This is indicated to the user, which may choose to reduce load in general – or not, being aware of what is going on.

Overload signaling and overload protection

The CHORD block of the panel is used to indicate overload or potential overload as follows:

Overload on the MIDI1 port is indicated by a red lit CHORD1 LED. Overload of the MIDI2 port is indicated by a red lit CHORD2 LED.

What the lights really tell you is that the respective MIDI port pipe is too full to carry additional load, and some MIDI data was potentially dropped.

One way to work around this is to make sure you use both MIDI ports and distribute the load accordingly between the two.

CPU load is a bit trickier, since the CPU has many tasks to complete. For all practical purposes, CPU overload means that not all data may have been processed by the CPU in a timeframe that would allow timing to stay relatively stable (our subjective impression).

CPU (over-) load is indicated in the CHORD3 to CHORD7 LEDs in two stages: stage one indicates that CPU is at about 80% load. This is shown by the CHORD3-CHORD5 LEDs being orange. Stage two indicates that the CPU is overloaded, indicated by CHORD6 and CHORD7 LEDs lit up red.

All data that was not processed was obviously ignored.

Additional notes

You may observe at times that the CPU is overloaded while the MIDI pipes are not. This means that the CPU is busy doing stuff other than sending MIDI. One probable explanation is that you are probably making extensive use of the track speed multipliers.

For your understanding, a track playing at 4x speed uses roughly 3 times more CPU cycles than a track playing at 1x speed.

Under respective circumstances it is possible to achieve CPU overload even at very low tempo values, i.e. if a big enough data stack awaits to be processed, but as a general rule, lower tempo values allow for more load to be handled.

Final remarks

Note that the two bottlenecks are serially connected, CPU first, MIDI second. They also know of each other in the sense that if a MIDI pipe is full, the CPU will not process for it more data (it gets dropped anyways) until it sees that the data really gets sent out of the MIDI pipe.

This is to save resources for other tasks such as executing key presses, rotary turns, or display updates.

When Octopus is under very high load, you may possibly see slight glitches of the display.

For example, it may seem that the chaser light is not being moved correctly. This is just a visual issue and may occur because sequencer operations have higher priority than processing visual data.

System design flaw?

This leads us to our final remark, since this topic did raise some questions in the past: we are confident, and time has proven us right, that the amount of resources available under the “clip” level of the overload protection mechanism is in no way representing a constraint to the user’s work, and we do not see an issue.

To translate into an analogy from the synthesizer world, we rarely see an issue if the number of voices available does not correspond to the number of keys on the keyboard.

By the same token, a synthesizer with a 61 key keyboard and polyphony below 61 is surely not subject to a flawed design.

Saving the instrument state

Octopus can save the full instrument state for later recall – all settings are stored to FLASH memory and automatically recalled upon power-on.

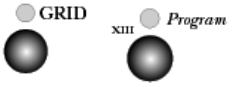
Note that only one state may be saved to FLASH, replacing any previously saved machine state. Also note that in order to perform this operation the sequencer has to be stopped.

WARNING:

Please make sure that Octopus is not turned off or reset during the save operation!

Saving the machine state

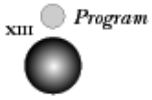
To perform a save of the machine state go to GRID Mode and press and hold the GRID button. While you hold down the GRID key, the Program LED will start to flash.



Pressing the Program key will start the save operation. Expect the save operation to take about 5-10 seconds.

Saving individual pages

Occasionally it may be useful to save individual pages only, as opposed to the full instrument state. For this to work the machine has to be stopped, and you have to be in GRID mode.



While in GRID mode, make sure that the EDIT LED is lit up orange, otherwise press it once to make it light orange.

Now press and hold the matrix button corresponding to the page you are about to save. This will reveal a red blinking Program button (among others).

While holding the matrix button pressed, click on the red blinking Program button to save the respective page to memory.

Loading individual pages from flash

To recall an individual page from flash memory, go to PAGE mode of the page you want to recall from flash first. Now press and hold the PAGE button, and press the green blinking ESC button. Note that

this operation may be performed at playtime, i.e. the sequencer does not have to be stopped for this operation.

Save progress

The progress of the save operation is depicted in the note inner circle, and operation completion is signaled by a complete circle.

NOTE: If a save operation does not complete, the saved memory contents will be irreversibly lost and the previously saved instrument state will likely become corrupted as well.

Things to remember

Some of this is repeating information, but it may be a good time to remember it.

You can always revert back to the last saved state by simply pressing the reset button found on the bottom pane of Octopus (just underneath the Tempo knob). This will clear all changes made since the last save operation.

If you power up Octopus while holding the CLR button, you will start without loading the saved state from memory, starting off with a virtually fresh machine.

To completely clear the Octopus RAM memory back to the factory default, go into GRID mode, press and hold GRID, and then press the CLR Mutator button. This does not affect the machine state saved in FLASH memory in any way.

Exporting memory content to MIDI

Octopus may export content of its memory by the means of MIDI system exclusive (SYSEX) dumps.

This is particularly useful when you would like to archive data on a computer, or even share memory content across Octopus machines.

Before you continue, please make sure that the sequencer is stopped. Connect the MIDI Out 1 port of your Octopus with your receiving device, considering that SYSEX data will be export out of the Octopus port 1 only.

Export content mode

Three types of SYSEX export streams are available: PAGE, BANK and GRID. In order to trigger the export operation (SYSEX dump operation), you need to be in the EXC mode on the Octopus.

To enter the EXC mode, press and hold GRID while pressing the green blinking EXC / ALN button. You should see the EXC LED turn orange and blink steadily.

To exit the EXC mode you may press ESC and return to GRID mode.

Page exports

A PAGE export will output the full contents of a page as MIDI SYSEX stream.

To trigger a page save, while in EXC mode simply press the button of the page that you would like to export. Only lit matrix buttons will have an effect, basically preventing you from accidentally dumping empty pages.

Notice that he circle is used as a progression indicator, and pages sent have their LED turned from green to orange (this is true for all dump types) for the duration of the data transfer. A single exported page should take on the order of 10 KB.

Page imports

When played back to the Octopus, a previously exported page will be reloaded into its original and natural location in the grid, i.e. the position it was in at the time of its export. This means also that it will overwrite any content in that location.

Note that playback of SYSEX content to the Octopus may occur at any time, including while the sequencer is running.

Once the page is received, the machine will switch to GRID mode and the page data is pasted from the incoming SYSEX buffer into the page memory. This operation is equivalent to a page copy.

Bank exports

A bank export will export all non-empty pages in a bank, and behaves very similarly to exporting page content, basically chaining several page export operations.

To trigger a bank export, simply press the button of the bank you would like to export, in the SEL column.

The duration of a bank export is dependent on the number of pages that will be exported, but as an indicator, the size of a full bank is on the order of 160KB. Here as well, the circle acts as an indicator to show progression of the transmission.

Grid exports

The GRID export is covering all the data that is not page related, but has an influence on the overall machine behavior. This includes parameters like strum levels for example.

To initiate a grid export, simply press the green lit MIX button on the bottom left side of the front panel.

The exported GRID content will take on the order of 37K, and the circle is used to show the progression of the transmission.

All pages and full machine state export

Two more options are available for SYSEX dump: dump all pages at once via the SEL key, and dump the full machine state at once via the EDIT key.

The same results may be achieved by several partial dumps as described above.

Data transmission rate

The throughput of SYSEX data is dependent on the tempo set at transmission time. Adjusting it knowingly may be useful in cases where your external periphery needs a lower transmission rate than Octopus is potentially capable of providing. Obviously, a lower transmission rate will result in more time required by the dump to

complete. You may want to experiment a bit to find the rate that is best suited for your particular setup.

Remarks

Note that you can use the export functionality only while the sequencer is stopped. This is a measure to ensure concurrent data integrity of the SYSEX dump and timing stability of the material played.

You may however, receive SYSEX data while the sequencer is playing. This makes it particularly convenient to substitute memory content on the fly, during performance.

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